October 21, 2019

Mr. Roger Adams, P.E.
Mr. Rick Reisinger, P.E.
Division of Dam Safety
Bureau of Waterways Engineering
Rachel Carson State Office Building
PO Box 8554
Harrisburg, Pennsylvania 17105-8554

Dear Roger and Rick:

Subject: Application for a Dam Permit
Panther Hollow Lake Rehabilitation Project
City of Pittsburgh, Allegheny County, PA
CEC Project 174-960

On behalf of the City of Pittsburgh Department of Public Works (DPW) and the Pittsburgh Water and Sewer Authority (PWSA), Civil& Environmental consultants, Inc. (CEC) is pleased to provide to the Pennsylvania Department of Environmental Protection (PADEP) Harrisburg, Pennsylvania Office this package for Application of a Dam Permit (Application) for the Panther Hollow Lake Rehabilitation Project (Project) located in Schenley Park, Allegheny County, Pennsylvania. CEC is requesting review and approval of the application in accordance with Title 25 of the Pennsylvania Code (PA Code), Section 105.81. This section presents the information required by PADEP for a modification to an existing dam.

In order for PADEP to issue an approval to the Application, specific information must be included in the Application. In accordance with Section 105.81 of the PA Code, the following information is being provided.

(1) Reports and data detailing the conduct and results of investigations and tests necessary to determine the safety, adequacy and suitability of design, including:

(i) Data concerning subsoil and rock foundation conditions.
(ii) Data concerning exploratory pits, drilling, coring and tests to determine seepage rates.
(iii) Data concerning the strength tests necessary to measure the physical properties and behavior of foundations and embankment materials at the dam or reservoir site.
(iv) Data concerning the geology of the dam site or reservoir area, indicating possible hazards such as faults, weak seams and joints.

A report entitled "DESIGN REPORT – PANTHER HOLLOW LAKE DAM AND LAKE REHABILITATION" is included in this submission. A Dam Stability and Geotechnical Report signed by a professional engineer is attached to the Design Report as Appendix C.

(v) Data concerning availability and quality of construction materials.

Section 7.0 of the DESIGN REPORT provides a discussion on constructability of the labyrinth and ancillary structures.

(vi) A ''Dam Stability Report'' as required under § 105.97 (relating to stability of structures).

Section 6.0 of the DESIGN REPORT provides a detailed discussion of the structural stability of the dam. The Dam Stability and Geotechnical Report attached to the Design Report as Appendix C..

(vii) Other information as may be necessary to determine the safety, adequacy and suitability of the design, including the design calculations for the dam, which shall be made available to the Department on request.

Discussion regarding the criteria and methodology associated with the various design components of the dam are presented in the DESIGN REPORT. The calculations for the design are included in Appendix E of the DESIGN REPORT.

(2) Site plan and cross sectional views.

Plans signed by a professional engineer and folded are attached.

(3) Construction plans, specifications and design reports in sufficient detail to evaluate the safety, adequacy and suitability of the proposed dam, reservoir and appurtenant works, and a schedule indicating proposed commencement and completion dates for construction.

Construction plans signed by a professional engineer and folded are attached and specifications signed by a professional engineer are included as Appendix F to the DESIGN REPORT. Appendices containing the geotechnical report, design calculations is also included.

(4) A schedule indicating propose commencement and completion dates.

A schedule for construction is attached as Appendix F to the DESIGN REPORT.

(5) For projects involving storage of fluids or semi-fluids other than water, information concerning the chemical content, viscosity and other pertinent physical characteristics of the fluid or semifluid impounded.

No impounded fluids or semi-fluids other than water are present at the site. CONSOL requested a water quality analysis which is included in Section 6.5.11.

(7) A hydrologic and hydraulic analysis, submitted as a separate report, that includes the following: The size, shape and characteristics of the drainage basin; Current precipitation data and precipitation distribution information as required by the Department; Streamflow records; Flood flow records and estimates; An incremental dam breach analysis, storage capacity and reservoir surface area for normal pool and maximum storage elevations; Other hydrologic and hydraulic determinations necessary for the design and operation of the dam.

Section 6.5 of the DESIGN REPORT discusses the Hydrology and Hydraulics associated with the Project. Appendix D of the DESIGN REPORT contains the Hydraulic and Hydrologic Report. The report contains watershed information, rainfall information, soil map information, HEC-HMS information, stage storage information and dam breach analysis information. CEC anticipates that PADEP will utilize this information to provide a classification for the dam.

(8) For an existing dam, copies of the structure's most recent inspection reports.

Inspections are not performed by the City of Pittsburgh. An inspection report will need to be performed.

(9) An EAP if required under § 105.134 (relating to EAP).

An EAP will be provided to PADEP under separate cover.

(11) An operation and maintenance manual for the dam a required under Section 105.131.

The Operating and Maintenance manual will be provided to PADEP under separate cover.

(12) Other information the Department may require.

An Environmental Assessment and a Wetlands Delineation Report have been provided as Appendix B and G, respectively to the DESIGN REPORT.

The Application is awaiting signature from the City of Pittsburgh. As soon as the signatures are obtained, the forms will be forwarded to PADEP.

CEC appreciates this opportunity to provide PADEP with this Application. CEC and PWSA will be happy to visit with PADEP in Harrisburg upon receipt of this package to discuss any element of the project and answer any questions. We look forward to your review. If there are any immediate questions, please do not hesitate to contact us.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Patrick J Sullivan Jr.

Patrick J Sullivan, P.E.
CEC Principal

CC: Doug Caylor, PE – Section Chief of Dam Safety, Western Pennsylvania, PADEP
Ryan Knarr, PE – Chief of Hydrology and Hydraulics, PADEP
Alex Sciulli, Chief of Program Management, PWSA

174-960 Letter Roger Adams Application for a Dam permit-10-21-19/P

DESIGN REPORT

PANTHER HOLLOW
DAM AND LAKE REHABILITATION

Prepared for:

City of Pittsburgh, Department of Public Works

and

Pittsburgh Water and Sewer Authority
1200 Penn Avenue
Pittsburgh, PA 15222

Prepared by:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

TABLE OF CONTENTS

LIST OF APPENDICES (Section First Referenced)

1. INTRODUCTION

1.1. General

This Design Report (DR) for the Panther Hollow Lake Rehabilitation Project (Project) has been prepared for the City of Pittsburgh, Department of Public Works (DPW) and the Pittsburgh Water and Sewer Authority (PWSA) by Civil and Environmental Consultants, Inc. (CEC) and in accordance with Contract Number PWSA89 executed on April 20, 2018. This DR is an implementation document that provides the technical basis for the development of plan drawings, details, and specifications associated with the design and subsequent construction rehabilitation of an earthen embankment dam, lake and wetlands area. Ancillary design and construction items include a principal and emergency spillway, lake dredging, earth excavation and backfill, stone erosion protection, concrete spillway control section and cutoff wall, piping and valves, existing lake edge demolition, concrete work, dewatering, revegetation of disturbed areas and erosion and sediment pollution control measures for the Project, located in Schenley Park in Allegheny County, Pennsylvania (Site).

1.2. Purpose of Design Report

The purpose of the DR is to summarize and provide the important design assumptions, criteria, and decisions that have been made through the evolution of the design process to arrive at a design that is technically feasible, cost-effective and aesthetically pleasing to PWSA. The information will include results of investigations, analyses, calculations, quantities, cost estimates, and figures or drawings primarily associated with the design of the Project. This DR will be submitted to appropriate state and local agencies for use in the review of the design, including construction drawings and specifications, in order to obtain approval for construction. Upon review and approval of the design by the Pennsylvania Department of Environmental Protection, Bureau of Waterways (PADEP), a permit will be issued to PWSA or their appointed entity (City of Pittsburgh) to allow for the rehabilitation of the Project to proceed.

1.3. Objectives of the Project

The primary objectives of the project are to submit an application to properly classify and permit the dam with PADEP, to provide additional stormwater storage to reduce the potential for flooding in specific downstream areas, to provide proper hydraulic features to safely convey a selected design flood and to drain a portion of the lake in an emergency situation. Another objective is to return the lake to a healthy environment with the removal of decades of sediment accumulation from upstream development and to construct features to reduce the future sediment deposition.

1.4. Dam Application

As part of this DR, an "Application for a Dam Permit" has been prepared and submitted to PADEP in conjunction with the drawings, specifications and reports and appendices. The application is provided in Appendix A.

2. PROJECT DESCRIPTION

2.1. Site Location and Description

The Site is located in Pittsburgh, Pennsylvania and covers an area of approximately 150 acres; however the drainage area extends well beyond the Site limits and covers approximately 2,300 acres. It is bounded to the north by Phipps Conservatory, Schenley Drive, and Circuit Road; to the east by Overlook Drive; to the south by a neighboorhood know as Four Mile Run, a brownfield site known as Hazelwood Green and the Monongahela River; and to the west by Swineburn Street, Boundary Street and the neighboorhood know as South Oakland. A United States Geologic Survey (USGS) map of the Site is presented on Figure 2-1.

Figure 2-1 USGS Topographic Image of the Site

A Google Site Plan is presented in Figure 2-2

Figure 2-2 Google Aerial Image of the Site

The principal features on the Site include Phipps Run and Panther Hollow Run, Panther Hollow Lake, Junction Hollow, the Four Mile Run neighborhood, Saline Street/Greenfield Avenue and the Hazelwood Green site. Phipps Run is an existing stream approximately 3,400 feet long located at the north end of the Project. The stream generally flows in a north to south direction and is contained within a wooded area of Schenley Park. Panther Hollow Run is located just south of Phipps Run and is approximately 4,100 feet long. It generally flows in a east to west direction and is also located within a wooded area of Schenley Park. Phipps Run joins Panther Hollow Run approximately 100 feet upstream of Panther Hollow Lake. The lake covers an area of approximately 2.43 acres and has a current capacity of approximately 6 acre-feet.

The Site is located in the center of Allegheny County in southwestern Pennsylvania, approximately 3.4 miles east of the confluence of the Allegheny and Monongahela Rivers with the Ohio River and just northeast of the intersection of Panther Hollow Road and Boulevard of the Allies. The Site is not accessible using a local or county road; the Site is only accessible using trails located within Schenley Park.

The Site is located primarily on the Pittsburgh East 7.5 minute United States Geologic Survey quadrangle map. The Site is located at approximately latitude 42˚26'13" and longitude 79˚56'57".

Topographic and planimetric mapping of the Site, including the embankment, adjacent ground surfaces, reservoirs and levels of sedimentation is discussed below.

2.2. Background Information

PWSA's downstream regional wastewater treatment provider is ALCOSAN, whose wastewater treatment plant (WWTP) currently processes an average of 250 million gallons per day (mgd) of wastewater. The PWSA sewer system is primarily a combined collection system that serves the City of Pittsburgh. The PWSA sewage collection system also serves as a conveyance system for portions of flows from 24 neighboring municipalities. Wastewater flows generated in neighboring communities are conveyed through parts of the PWSA collection system to the ALCOSAN interceptor system. The PWSA sewer collection system consists of approximately 1,080 miles of sewer ranging in size from six inches to 156 inches, and 29,000 manholes. Approximately 77 percent of the PWSA service area is served by combined sewers; however, the percentage of separate sanitary and storm sewers is gradually increasing as required sewer separation occurs during redevelopment. There are 74 active diversion structures, also known as diversion chambers, within the PWSA sewer system.

In 2015, the Mayor of the City of Pittsburgh tasked the PWSA with evaluating the benefits of incorporating Green Infrastructure (GI) approaches within the city limits. The evaluation would be incorporated into a Green First program that utilizes applicable social, economic and environmental components of GI and gray infrastructure to address regulatory requirements, collect and treat sewage and stormwater, treat stormwater, reduce combined sewer overflows (CSOs) and improve water quality in conveyance systems.

In 2017, PWSA completed the *The Green First Plan: A City-Wide Green Infrastructure Assessment*, which identified improvements to the existing sewer systems utilizing GI alternatives that addressed many of the above issues. One of the focal sheds in *The Green First Plan* was M29, which largely coincides with the historic Four Mile Run (4MR) watershed. M29/4MR has a contributing drainage area of approximately 2,400 acres and includes flow from the Squirrel Hill, Greenfield, Oakland, and Hazelwood neighborhoods that converge within Schenley Park. It is the third largest CSO contributor in the city, contributing approximately 400 million gallons of CSO annually to the Monongahela River. It is also documented as a chronic basement backup and neighborhood flooding issue in the 4MR neighborhood, hereinafter known as "The Run".

The M-29 sewershed is the 3rd largest CSO contributor in the city and has approximately 400 million gallons of water flow through the sewershed. The contributing drainage area includes flow from the Squirrel Hill, Greenfield, Oakland, and Hazelwood neighborhoods and initial proposed solutions have a significant footprint within Schenley Park. The City-Wide conceptual urban plan for the M-29 Sewershed includes redirecting stormwater from surrounding neighborhoods through the Schenley Park stream system and Panther Hollow Lake and reestablishing a direct connection back with the Monongahela River via the Hazelwood Green, the property formally known as the Almono site.

2.3. Proposed Work

The proposed work will consist of the detailed civil, hydraulic and structural design of the embankment and ancillary features at the Site. Principal design components include the raising of the existing embankment height of the earthen dam with select fill to provide additional stormwater storage and address low elevation locations on the existing dam crest, the installation of a principal spillway pipe to route a selected design storm to downstream hydraulic features, the construction of an open channel emergency spillway and control section to safely convey larger storm events, The construction of a low level outlet structure, the demolition of an existing curb edge on the entire perimeter of the lake, the dewatering of the lake to facilitate dredging to remove accumulated sediment, the construction of a forebay pond to collect future sediment depositions, the natural rewatering of the lake upon completion of construction and the revegetation of disturbed areas.

The proposed work will be performed in accordance with Title 25 of the Pennsylvania Code, Chapter 105, Subchapter B Dams and Reservoirs (PA Code Chapter 105). A review of the chapter was performed to identify the criteria associated with the design of the dam at Panther Hollow Lake. Several sections in the chapter provide information on the design of specific components of the dam. The applicable sections are outlined below:

- Section 105.13 – regulated activities – information and fees. This section discusses the forms, the fees and the administrative and supplemental information required as part of the application forms. Administrative/supplemental information includes stormwater analysis, floodplain analysis, risk assessments, photographs, project description and/or Impacts analysis.
- Section 105.81 – Permit application for construction and modification of dams and reservoirs. This section discusses the more technical information that is to be prepared and submitted with the application. For this Project, this information includes a geotechnical investigation report, a hydrologic and hydraulic report, an emergency action plan, an operation and maintenance plan, construction plan drawings, specifications and a design report.
- Sections 105.92 through 105.97. These sections discuss the design criteria associated with specific components of the dam and reservoir, including foundations, design stresses, spillways, freeboard, outlet works and stability of the structure.
- Section 105.98 – Design Flood Criteria. This section recommends the design flood to be used for the dam, based upon the classification of the dam.

2.4. Project Objectives

The objectives of the design for the Project are as follows:

1. Perform a site reconnaissance and conduct a geotechnical investigation at the Site.
2. Obtain geotechnical soil parameters for use in design.
3. Design Erosion and Sediment Controls for the site.
4. Perform a hydrologic and hydraulic analysis and use results to establish the classification of the dam.
5. Prepare excavation, grading and fill placement designs for the structures.
6. Prepare a structural design of select principal spillway and emergency spillway features.
7. Prepare contract drawings illustrating the design.
8. Prepare technical specifications to supplement the drawings.
9. Prepare this Design Report summarizing the process, criteria and information associated with the design.
10. Prepare permits associated with the design to applicable State Agencies, including:
    - General NPDES Permit (PAG-02) for Stormwater Discharges Associated with Construction Activities
    - Erosion and Sediment Control Application
    - Post Construction Stormwater Management Plan
    - Water Drawdown Application
11. Submit a design package and permit applications to appropriate state agencies.

3. SUMMARY OF PERTINENT DATA

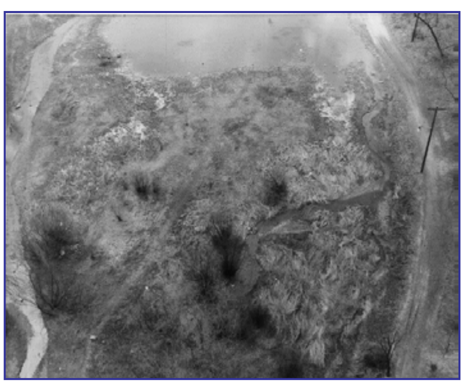
3.1. Construction History


Reconstruction of Panther Hollow Lake Chute

Ethos Collaborative and CEC performed a detailed investigation and review of historical documents regarding Panther Hollow Lake. Panther Hollow Lake has been in existence since at least 1908, when it was enlarged from an existing smaller open body of water for the purpose of enhancing recreation in the relatively new Schenley Park. Since then, its last major renovation was in 1957, with dredging, construction of a concrete edge in the modernist style, and a bypass channel that diverted high flows around instead of through the lake.

Since its creation, Panther Hollow Lake has experienced problems with sedimentation that result in poor water quality, reduce its value as a recreational resource, and decrease its effectiveness for potential stormwater attenuation. Sedimentation is a process common to all lakes and streams but can particularly be problematic in steeply-sloped urban areas where upstream development contributes to higher intensity stream flows and stream channel incision over time. In man-made lakes, the sedimentation/deposition process can proceed faster than in natural lakes, resulting in the need for periodic dredging if the lake is to maintain design depths and perform design functions.

Panther Hollow Run and Phipps Run continue to deposit sediment sourced from upstream areas, a process which led to considerable filling in of the eastern portion of Panther Hollow Lake and creation of an emergent wetland. To reduce ongoing maintenance needs for Panther Hollow Lake, the Lake was drained and dredged in 1957, and the edge reinforced with concrete edge walls.

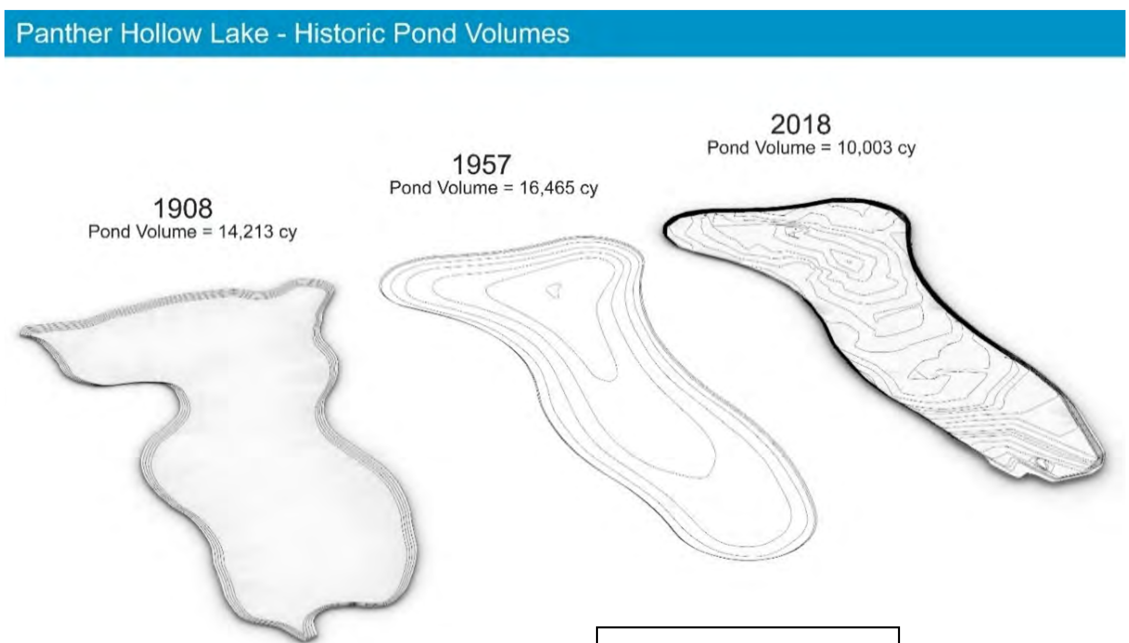



Sediment accumulation forms a wetland in 1958 (left, as pictured from Panther Hollow Bridge) and in 2018 (right, as pictured from the east) within Panther Hollow Lake.

Another source of sediment to the Lake is the steep slopes surrounding the site. Historical and modern-day landslides have been observed on the steep slopes to the north and south of the Lake. Note the similarities between the historic landslide from 1957 and one that occurred in mid-2018, immediately below the solar panel array at Phipps Conservatory.

The slopes above the lake have a history of landslides as shown in 1957 (left) and in 2018 (right).

Ethos Collaborative estimated that sedimentation has reduced the volume of the Lake by 39 percent since it was last dredged in 1957. Figure 3 shows the historic change in lake volume from 1908 to 2018.



Change in Lake Volume.

Figure 3 Historic Panther Hollow Lake Volumes

Nutrients and bacteria attached to the sediment load can increase the risk of eutrophication and pose some level of public health and safety risk. Decreasing water depth also increases the temperature of the water, which can also increase eutrophication and negatively impact aquatic habitat. With this accumulation history in mind, Lake restoration plans were explored that include elements intended to decrease sediment management requirements, reduce periodic dredging, and prolong the functionality of the designed Lake ecosystem.

Panther Hollow Lake 2019

3.2. Preliminary Design Memorandum

In July of 2019, CEC submitted a Preliminary Design Memorandum (PDM) to PWSA. The PDM provided numerous design alternatives to meet four goals and benefits of PWSA's Four Mile Run (4MR) Stormwater Improvement Project. The goals and benefits of the 4MR project are to reduce combined sewer overflows, reduce flood risks and basement backups, reduce sedimentation and erosion, and leverage resources for regional benefit. Preliminary design and opinions of construction cost were developed for each alternative. A total of 22 alternatives were developed. Evaluations of the alternatives were provided in the PDM as well. The evaluations involved a ranking system based off of 9 design criteria that were determined by stakeholder workshops. The criteria used to rank the alternatives include Opinion of Construction Cost, Performance, Public Perception, Operation, Maintenance and Inspection, Risk, Infrastructure Obstructions, Implementability, Schedule, and Sanity Check.

Two of the alternatives described and evaluated in the PDM involved the restoration of Panther Hollow Lake and the design and installation of a principal spillway pipe and an emergency spillway. The ranking of these alternatives were favorable and were recommended for full design and construction. Preliminary design of the lake grading, embankment raise, principal spillway pipe, and emergency spillway were prepared as part of the PDM.

3.3. Site Mapping

In 2019, Phronesis, LLC (Phronesis) contracted with AWK Consulting Engineers, LLC (AWK) to perform a topographic survey of the Site in conjunction with the Four Mile Run Schenley Park Project. AWK commenced the original field work in January 2017 and completed the field work in March 2017. The survey was completed in the North American Vertical Datum (NAVD) 1988 and Pennsylvania State Plane (feet) coordinates NAD 83 modified to the ground. Benchmarks and control points were set within the proposed project limits.

As part of the 4MR Project, CEC reviewed the original topographic survey prepared by AWK and contracted with AWK to provide additional supplemental survey field work in support of the design work and to fill data gaps. AWK provided CEC with the survey AutoCAD file which was used to prepare the existing conditions base map that the design team utilized to develop the design alternatives.

3.4. Property Ownership

The Site property is currently owned by the City of Pittsburgh.

4. REFERENCES

Reference documents utilized in the design of the Project are discussed throughout the body of this DR. A preliminary list of referenced documents is presented below.

HYDRAULICS

(1) Gary L. Lewis, Introduction to Hydrology, Prentice Hall, 2002, pg. 292.
(2) L.W. Mays, Water Resources Engineering, John Wiley & Sons, Inc., 2005, pg. 269.
(3) Geoffrey M. Bonnin, Deborah Martin, Bingzhang Lin, Tye Parzbok, Michael Yekta, and David Riley, NOAA Atlas 14, Precipitation – Frequency Atlas of the United States, Volume 2 Version 3.0, October 4, 2006
(4) E.M. Hansen, L.C. Schreiner, and J.F. Miller, NOAA Hydrometeorological Report No. 52, August 1982
(5) Roger Cronshey, and Dr. Richard H. McCuen, Norman Miller, Dr.Walter Rawls, Sam Robbins, Don Woodward, Urban Hydrology for Small Watersheds, Technical Release 55, June 1986
(6) Guidelines for Inundations Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, July 2013)
(7) Guidelines For Performing An Incremental Dam Breach Analysis And Downstream Inundation Study (PADEP)

STRUCTURES

(1) ACI 201.2R-08, Guide for Durable Concrete, 2008.
(2) ACI 225R-99, Guide to the Selection and Use of Hydraulic Cements, 1999.
(3) ACI 318-08, Building Code Requirements for Reinforced Concrete, 2008.
(4) ACI 330R-08, Guide for Design and Construction of Concrete, 2008.
(5) ACI 350-06, Code Requirements for Environmental Engineering Concrete Structures and Commentary, 2006.
(6) ACI 360R-06, Design of Slabs-On-Grade, 2006.
(7) ASCE 7-05, Minimum Design Loading for Buildings and Other Structures, 2005.
(8) International Building Code, International Code Council, Inc., First Printing: January 2006.
(9) OSHA Regulations, 29 CFR Part 1910 Occupational Safety and Health Standards.
(10) OSHA Regulations, 29 CFR Part 1926 Subpart M – Fall Protection.
(11) The Pennsylvania Code Title 25 Environmental Protection, Chapter 105, Dam and Reservoirs.
(12) US Army Corps of Engineers, EM 1110-2-2007, Structural Design of Concrete Lined Flood Control Structures.
(13) US Army Corps of Engineers, EM 1110-2-2100, Stability Analysis of Concrete Structures.
(14) US Army Corps of Engineers, EM 1110-2-2102, Waterstops and Other Preformed Joint Materials for Civil Works Structures.
(15) US Army Corps of Engineers, EM 1110-2-2104, Strength Design for Reinforced – Concrete Hydraulic Structures.
(16) US Army Corps of Engineers, ER 1110-2-1806, Earthquake Design & Evaluation of Civil Works Projects.

EARTHWORK

(1) US Army Corps of Engineers, EM 1110-2-1901 – Seepage Analysis and Control for Dams – 30 April 1993
(2) US Army Corps of Engineers, EM 1110-2-1902 - Stability of Earth and Rock-Fill Dams – 31 October 2003
(3) US Army Corps of Engineers, EM 1110-2-1913 - Design and Construction of Levees – 30 April 2000
(4) US Army Corps of Engineers, EM 1110-2-2300 – General Design and Construction Considerations for Earth and Rockfill Dams – 30 July 2004
(5) Groundwater and Seepage, Milton E. Harr, 1990.
(6) Designing with Geosynthetics, 3rd Ed, Robert M. Koerner.

SITE BACKGROUND INFORMATION

(1) Draft Basis of Technical Design Memorandum, Four Mile Run-Schenley Park Green Infrastructure Concept-20% Preliminary Design. Burns McDonnell, 2017
(2) Four Mile Run: Schenley Park – Pittsburgh, Pennsylvania - CSO Disconnection and Stream Daylighting, Conceptual Design Memo. NSI and EDC, June 09, 2009
(3) Pittsburgh Regional Parks Natural Areas Study, Natural Areas Program Phase 1 Report: Assessment Results and Management Plan Framework. City of Pittsburgh, June 2010
(4) Pittsburgh's Regional Parks Master Plan - A New Ethic of Stewardship. Laquatra Bonci Associates / Michael A. Stern / Biohabitats, Inc. / Tai +Lee Architects
(5) PWSA Four Mile Run Drainage Study. Chester Engineers
(6) Regional Parks Master Plan - 2012 Update, Envisioning the Historic Regional Parks as Cornerstones of a Vibrant Parks and Open Space System for a Sustainable 21st Century City. City of Pittsburgh and the Pittsburgh Parks Conservancy, Nov. 2014
(7) National Resources Conservation Service (NRCS) Soil Survey of Allegheny County, Pennsylvania
(8) Geotechnical Investigation Services, Green Infrastructure Concepts Plan for Schenley Park, Pittsburgh, Pennsylvania. AWK Consulting Engineers, Inc., March 2017

5. RECONNAISSANCE AND GEOTECHNICAL INVESTIGATIONS

5.1. General

This section of the DR discusses the investigative activities performed for the Project. They include site reconnaissance and four subsurface investigations. The observations discussed below are presented on the design drawings. These activities are discussed below.

5.2. Site Reconnaissance

Over twenty (20) visits to the Site were conducted between May of 2018 and April of 2019. The purpose of these visits was to develop a familiarization with the Site, to create a visual relationship between the site conditions and the proposed design features, and to supplement existing information with the information collected during the site visits. The initial site reconnaissance was performed by CEC and several of its nine (9) team subconsultants on May 16, 2019. The most recent site reconnaissance was performed by CEC in August 2019. Reconnaissance activities generally consisted of the general observation of appurtenances in the area, vegetation and trails, the existing location of the embankment dam and reservoir, and the stream inflow locations. Existing hydraulic facilities, including manholes, drainage channels, stormwater diversion weirs, catch basins and piping and were also observed, Field notes with photographs of critical elements documented the reconnaissance activities. Subsequent site visits were performed in conjunction with specific tasks or scope items associated with the design. The findings associated with the site visits are described below.

Plan Map of Panther Hollow Lake and surrounding features

5.2.1. Lake Area

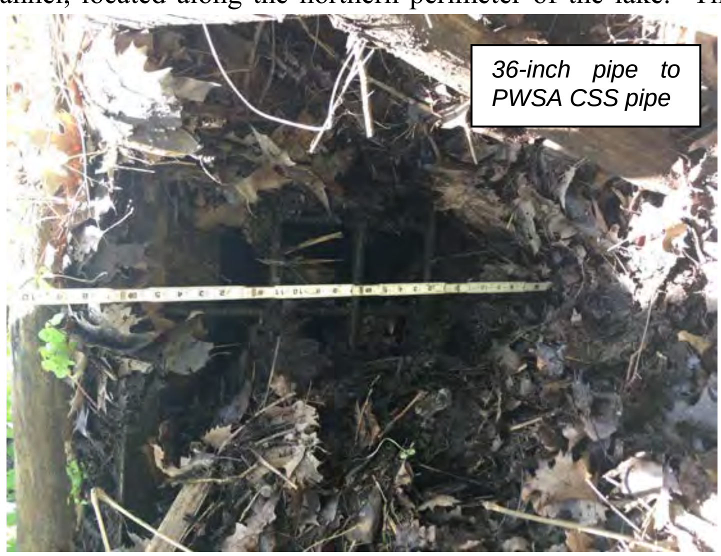
Panther Hollow Lake is a trapezoid shaped lake approximately 620 feet long, measured in an east to west direction and 160 feet wide and covers approximately 2.43 acres. The perimeter of the lake is delineated by a concrete edge; the concrete creates three steps that provide freeboard between the water surface and the adjacent existing ground surface. The steps are 15 to 18 inches wide and 6 to 7 inches high. Grass or trail can be found adjacent to the top edge of the step. The easternmost portion of the lake is occupied by sediment and wetlands. These wetlands were formed from sediment depositions emanating from the two tributary streams that discharge into the lake at the

Panther Hollow Lake and embankment (foreground) easternmost end. Phipps Run and Panther Hollow Run provide the majority of the base and storm flow from the 0.60 square mile watershed upstream of the lake. This watershed primarily consists of the Oakland neighborhood of Pittsburgh. A review of historical reports indicates that the lake was last excavated to remove sediment sometime in the 1980's. The eastern most end of the lake is where sediment has accumulated above the water surface elevation, which is reported at 806 feet; however, sediment has accumulated across the entire footprint of the lake. A bathymetric survey performed in 2018 reports the maximum water depth at 4 feet. Historical reports indicate that after the last sediment excavation in 1957, the maximum water depth was over 7 feet.

5.2.2. Lake Diversion Structure

Diversion Structure with concrete bypass channel (background)

Flow to the lake is controlled by means of a simple in-channel diversion structure, located at the confluence of the two streams. During base flow and small storm conditions, flow from the tributary streams is conveyed directly to the Lake through a small rectangular orifice (approximately 1'-9" wide x 12" to 18" high) in a low concrete dam, approximately 2'-0" high. During larger storms, an 8'-0" bypass weir is engaged which conveys larger flows to a concrete, trapezoidal bypass channel, located along the northern perimeter of the lake. The channel maintains a bottom width of three feet, a depth of approximately three feet and 1H:1V side slopes. The channel directs stormflow around the Lake and discharges into a steep sloping 36-inch diameter pipe located at the northeast corner of the embankment. This pipe is connected to a deep combined sewer system (CSS) pipe operated by the PWSA. The bypass channel also picks up several hillside seeps and stormwater runoff from the northern valley slope adjacent to the lake.



36-inch pipe to PWSA CSS pipe

5.2.3. Earthen Embankment

The existing earthen embankment is oriented in a south and north direction, which was established during original construction of the embankment and is approximately 330 feet in length.

The approximate ends of the embankment tie into the existing valley slopes, which are covered with mature trees. The embankment surface is covered with established grass. The downstream toe of the embankment terminates near an existing drainage ditch that runs parallel to the CSX railroad tracks. Three mature trees are located on or near the embankment crest. The embankment crest elevation varies from a high point of 810 feet near the center to a low point of 808 at the north and south ends. A swale near the south end of the embankment that serves as an access point to the railroad tracks is the extreme low spot on the crest, with an elevation of approximately 807 feet.

5.2.4. Existing Lake Overflow Drain

To maintain the lake pool at its current elevation of approximately 806, an existing grated overflow drain is located in the concrete edging of the lake near the northwest corner. This drain is approximately 15" by 24" and is connected to an 18-inch clay pipe that connects to an existing manhole located at the north ending to the existing combined sewer system. This combined sewer system ultimately discharges at the Monongahela River. The true condition of these structures is unknown due to the inlet being full of water and the downstream manhole being unattainable.

5.2.5. Stream, Lake and Wetlands Delineation

CEC conducted wetland and stream delineations at the Site between May and July of 2018. The purpose of this study was to identify, delineate, and classify wetlands, streams, and other waters located within the limits of the study area.

CEC ecologists reviewed the study area for potential wetlands in accordance with the routine, onsite determination methodology described in the U.S. Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987); referred to hereafter as Corps Manual, supplemented by the following technical guidance documents:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (January 2012); referred to hereafter as Regional Supplement;
- *National Wetland Plant List* (Lichvar, et al. 2016); and
- *Field Indicators of Hydric Soils in the United States* (USDA-NRCS 2017).

CEC ecologists walked the study area and collected sampling points at wetlands and representative upland locations. Data collected at each sampling point was recorded on a Wetland Determination Data Form.

Concurrent with wetland delineations, CEC ecologists assessed the site for streams and other waters such as ponds, seeps, springs, and vernal pools. These aquatic resources can be identified by the presence of an ordinary high water mark in accordance with USACE Regulatory Guidance Letter No. 05-05: Ordinary High Water Mark Identification (USACE 2005).

For streams, physical and biological data were used to infer the stream's hydrologic flow regime, using a weight-of-evidence approach. CEC used field indicators such as flow, substrate composition, presence of defined bed and bank, origin of hydrologic sources, presence/absence of vegetation within the stream channel, and presence/absence benthic macroinvertebrates, fish, and other aquatic biota to classify onsite stream segments into one of three stream types – ephemeral, intermittent, or perennial.

Three (3) wetlands were identified within the dam permit study area. One (1) was classified as palustrine emergent (PEM), one (1) was classified as PEM/palustrine scrub-shrub (PSS), and Panther Hollow Lake is classified as palustrine unconsolidated bottom (PUB). In total, 0.612 acre of wetland was delineated within the study area. This was comprised of 0.562 acre of PEM, 0.05 acre of PSS, and 2.34 acre of PUB.

The two major streams tributary to the lake are Phipps Run and Panther Hollow Run. Both of these streams were classified as perennial.

Wetlands, streams and other waters that meet the guidelines contained in the Corps Manual, Regional Supplement, and Regulatory Guidance Letter No. 05-05 are subject to regulation by USACE as "Waters of the U.S. (WOTUS)", as defined by 33 CFR 328.3(a) (U.S. Congress 1986). USACE has authority to permit the discharge of dredged or fill material into waters of the U.S. under Section 404 of the federal Clean Water Act (U.S. Congress 1977). Additionally, Section 401 of the Clean Water Act requires state agencies to evaluate whether discharges to these waters comply with state water quality standards (U.S. Congress 1977). A Section 401 Water Quality Certification is required for activities that require federal permits or authorizations. The Wetland and Stream Delineation Report, dated October 2018, is included in Appendix B.

5.3. Geotechnical Investigation No. 1 – June, 2018

As part of a broader geotechnical investigation program, on June 11, 2018, CEC supervised the drilling of one (1) test boring at the Site. AWK Consulting Engineers completed the drilling. The test boring drilled at the site was advanced to determine the depth and excavation characteristics of the existing soils. The test boring were generally advanced through the overlying fill using hollow stem auger drilling methods. A piezometer, used to record groundwater levels, was installed at the test boring location. No rock coring was performed. The test boring was 16 feet in depth.

5.4. Geotechnical Investigation No. 2 – November, 2018

As part of a broader geotechnical investigation program, between November 9, 2018 and November 18, 2018, CEC performed a supplemental geotechnical investigation consisting of the drilling of three (3) test borings. Terra Testing performed the drilling as a subconsultant to CEC. The test borings were drilled at the site to collect soil conditions in the vicinity of Panther Hollow Lake. The test borings were generally advanced through the subject fill and into the underlying residual soils. Hollow stem auger drilling methods were utilized. The test borings ranged in depth from approximately 20 to 40 feet bgs and totaled approximately 79 feet of soil sampling. No rock coring was performed.

5.5. Geotechnical Investigation No. 3 – July, 2019

As part of a broader geotechnical investigation program, between July 9 and August 23, 2019, CEC performed a supplemental geotechnical investigation consisting of the drilling of two (2) test borings. The test borings were drilled at the site to collect soil conditions in the vicinity of Panther Hollow Lake. The test borings were generally advanced through the subject fill and into the underlying residual soils. Hollow stem auger drilling methods were utilized. The test borings ranged in depth from approximately 28 to 34 feet bgs and totaled approximately 62 feet of soil sampling. No rock coring was performed. The samples collected were subjected to geotechnical laboratory testing to obtain soil parameters required for detailed geotechnical design.

5.6. Geotechnical Investigation No. 3 – September, 2019

On September 30, 2019, CEC performed a supplemental geotechnical investigation consisting of the drilling of two (2) test borings. The test borings were drilled at the site to collect additional Shelby tube samples, to verify geotechnical conditions from the July, 2019 geotechnical investigation. The Shelby tubes were subjected to geotechnical laboratory testing to obtain soil parameters required for detailed geotechnical design.

5.7. Lake Sediment Investigation – October, 2019

On October 3, 2019, CEC conducted a lake sediment investigation. The purpose of the investigation was to collect sediment samples to determine the chemical makeup of the materials for reuse of disposal. Five samples were collected in lexan tubes from a small rowboat. The lexan tubes were pushed into sediment over a distance ranging from 2.6 feet to 3.4 feet. The length of samples retrieved ranged from 1.3 feet to 1.8 feet. The samples will be analyzed for the following parameters; TCL Volatile Organics, TCL Semivolatile Organics, TCL PCBs and TAL Metals.

The complete Geotechnical Report is included in Appendix C.

5.8. Bathymetric Survey and Mapping

In 2016, AWK Consulting Engineers, LLC (AWK) performed a topographic survey of the Site in conjunction with the Four Mile Run Schenley Park Green Infrastructure Concept 20% Preliminary Design. AWK commenced the original field work in January 2017 and completed the field work in March 2017. The survey was completed in the North American Vertical Datum (NAVD) 1988 and Pennsylvania State Plane (feet) coordinates NAD 83 modified to the ground. Benchmarks and control points were set within the proposed project limits.

Upon review of the original topographic survey prepared by AWK, AWK provided additional supplemental survey field work in support of the design work and to fill data gaps. AWK prepared an updated AutoCAD file of the survey, which was used to prepare the existing conditions base map utilized in design.

In May 2018, AWK Consulting Engineers, Inc. conducted a detailed bathymetric survey of the existing Panther Hollow Lake to supplement existing LiDAR topographic data surrounding the lake. The bathymetric survey was a crucial part of the lake design since it provided a means to calculate the approximate amount of material that would need to be dredged from the lake.

6. DESIGN

6.1. General

This section of the DR discusses the specific design tasks associated with the Project. Design criteria, analysis methods, assumptions, and results associated with each design task are explained. Presentations of the designs on plan and detail drawings are also discussed. Results and conclusions developed during site reconnaissance efforts and during completion of the DR are discussed, and their relationship to design development presented.

The following design tasks were completed as part of the Project:

6.2. Geotechnical Design

6.2.1. Geotechnical and Environmental Laboratory Testing

Geotechnical laboratory testing of soil samples collected during the four investigations was performed for CEC by Geotechnical Testing Services of Coraopolis, Pennsylvania. Testing was performed on the split spoon and Shelby tube soil samples collected from the test borings. The testing conducted included grain size analysis, soil classification, moisture content, Atterberg limits, unit weights, triaxial shear test *in an undrained condition with pore pressure readings and Hydraulic conductivity*. Geotechnical results of all testing are presented in the Geotechnical Report, attached as Appendix C.

6.2.2. General Description of Soils

Based on the observations from the subsurface investigations and the results of the geotechnical testing, fill materials were encountered at the ground surface or directly beneath topsoil and ranged in thickness from approximately 14 to 30 feet and consisted of brown, dark brown and gray clay and silty clay. Traces of silt, sand and rock fragments were also identified. Varying amount of deleterious (organics, roots, plastic, etc.) materials were noted throughout the existing fill. The consistency of the fine-grained existing fill was variable, ranging from very soft to very stiff but was primarily very soft to medium stiff. USCS classifications of the fill varied between CL, CH and MH. Residual soils encountered beneath the fill materials consisted primarily of clay and claystone.

The moisture of the soil layer based on field observations, varied from moist to wet.

Bedrock was encountered in three of the test borings at depths that ranged from approximately 26.5 to 34.2 feet bgs. No NQ-size bedrock core was obtained as part of this investigation, however bedrock that was sampled through hollow stem augering and split-spoon sampling consisted of claystone. Bedrock will be not be encountered during raising of the existing dam embankment.

Water was present at the completion of soil sampling in Test Boring B-14 at a depth of 12.8 feet bgs. This test boring is less than 20 feet from the edge of the lake. The absence of water in the boring may be due to the impervious nature of the fill materials.

6.2.4 General Description of Soils – Sediment in the Lake

Based on the results of the sediment survey, the soil sampled from the lake consists of compacted fill and natural soils. Variations in the field descriptions of soil color and the sand and gravel sized components of the jar samples were relatively minor. The residual soils located beneath the sediment had field classifications of. The USCS classification of this soil was also CL.

6.2.5 Piezometer Installation

One piezometer (PZ-1) was installed at the southwest corner of the existing embankment to measure groundwater elevations. Measurements were taken between February and October of 2019. The groundwater readings varied from a low elevation of 801.1 feet to a high elevation of 805.8 feet. The groundwater results were utilized in the analysis of stability of the proposed embankment raise, discussed below. Additional groundwater information is presented in the Geotechnical Report, attached as Appendix C.

6.3. Reservoir Drawdown and Dewatering for Dredging/Excavating Lake Sediments

Prior to conducting sediment excavation activities, a temporary dewatering the lake will be performed to facilitate excavation activities in the dry. This approach will also be beneficial during the construction of the meandering channel for the Treatment Wetlands at the existing wetlands on the east side of the lake. In order to dewater, the existing streamflow and potential stormwater flow from Phipps Run and Panther Hollow Run will need to be diverted at the east end of the lake, prior to the Treatment Wetlands, discussed below. This will be accomplished by constructing a temporary berm at the confluence of Phipps Run and Panther Hollow Run. With the construction of the berm at this location, streamflow will be directed into an existing trapezoid shaped concrete bypass channel, discussed in Section 5.2.2 above. The channel is located near the toe of the valley slope on the north side of the lake. The channel discharges into an existing 36-inch diameter pipe, which leads to the PWSA CSS pipe.

Bypass channel for dewatering. Waterway to lake is lower left.

If necessary, additional fill can be placed on the downslope (lake) side of the bypass channel; when combined with the existing valley slope, additional depth for stormwater flow is provided.

Bypass channel on north side of lake

After lake excavation is completed and the Treatment Wetlands has been constructed, the berm at the confluence of the two streams can be removed and the lake allowed to naturally rewater. The bypass channel will then be demolished and removed, to facilitate excavation and grading on the north side of the lake. The 36-inch pipe leading to the CSS will also be partially demolished and sealed. This demolition and sealing will only be performed after the embankment raise has been completed and the principal spillway pipe and emergency spillway channel constructed.

6.4. Treatment Wetland

The Treatment Wetland is a mounded area that possesses a circuitous channel planted with native wetland species suited to the hydrologic regime. The channel receives discharges from the Forebay by means of a pipe that restricts flow to a maximum of 10 cfs, a level that will not promote scour, and conveys the flow for release to the Lake. By passing water through the planted circuitous channel, nutrients, contaminants, pathogens and sediment are filtered or captured and processed by the natural systems. The Treatment Wetland was designed with the intent of resembling the existing wetland area that has formed at the east end of the Lake, and to provide additional water quality benefits at a later date if it appears that the Lake water requires further treatment.

6.5. Forebay Pond

The Wet Sediment Forebay serves as a sediment sump for material transported by Phipps Run and Panther Hollow Run. The Forebay sits east of the lake receiving discharges from both streams. During dry weather and "normal" rainfall, the Forebay slows the velocity of the contributing flows allowing particles to drop out of the water column before over-flowing to the Treatment Wetland, thus limiting the build-up of sediment within the Lake itself. During periods of higher contributing flows, larger debris will drop out but fines will remain suspended and will progress to the Lake by way of the Bypass Cascade. Spatial constraints prevent enlarging the Forebay to provide better settling.

During normal operation, the Forebay will remain wet with levels controlled by the downstream Flow Control Structure. Periodic maintenance will include excavation of the accumulated material for replacement elsewhere. The design includes a dewatering gate valve and perforated bottom drain to allow for full drawdown in advance of maintenance, and a geo-grid reinforced ramp allowing for equipment to enter the area.

6.6. Material Excavation and Fill Placement

Excavation will be required to facilitate construction of the lake reshaping, the forebay, embankment raise, principal spillway pipe installation, and emergency spillway. Excavation is proposed for the following areas:

- Excavation will be performed over the footprint of the existing lake and will extend beyond the existing footprint in some locations to construct the proposed lake reshaping.
- Excavation will be performed east of the existing lake to construct the proposed forebay basin.
- Excavation will be performed on the existing earthen embankment crest to create a toe key for the proposed embankment fill to raise it approximately four feet.
- Excavation will be performed to facilitate construction of the principal spillway pipe. Excavation on both sides of the railroad tracks will occur to construct jack and bore pits for the proposed spillway pipe to cross under the railroad tracks.
- Excavation will be performed to construct the emergency spillway. The invert of the emergency spillway will be approximately 1 foot below the crest of the embankment, have a concrete liner, and a concrete cutoff wall. The cutoff wall will be located at the upstream end of the spillway and extend 18 inches below the spillway.

Fill placement will be performed at selected locations prior to and after construction of the lake reshaping, principal spillway pipe, and emergency spillway. The majority of fill placement will occur along the existing earthen embankment as part of the embankment raise. Material to be used as fill for the embankment raise will consist of a cohesive, well graded material compacted to 95% of the maximum dry density, as determined by ASTM D698 (standard proctor). The cohesive material will not be a high plastic clay (CH classification). A detailed discussion of the embankment raise is presented in Section 6.7 below.

6.7. Hydraulic and Hydrologic Analysis of Lake and Spillways

A hydraulic and hydrologic analysis was performed to develop the basic geometry for the lake reshaping, forebay basin, the principal spillway pipe size, and emergency spillway size. The hydraulic and hydrologic analysis was also performed to conduct a dam breach analysis. The Hydrologic and Hydraulic Technical Report is attached as Appendix D.

6.7.1. Stage vs. Storage Relationship

Stage vs. storage curves depict the relationship between the water surface elevation (ft) in a reservoir and the volume of water being stored. It is necessary to determine the stage vs. storage curves for Panther Hollow Lake to understand how the lake performs during flooding events to attenuate peak inflows; during both seasonally wet and dry conditions and to assess the lake yield.

CEC developed an existing stage vs. storage curve for Panther Hollow Lake using the bathymetric and topographic mapping developed by AWK in May of 2018. CEC developed a proposed stage vs. storage curve for Panther Hollow Lake based off the proposed design contours.

The stage vs. storage curve was used in the HEC-HMS model developed for the dam's breach analysis and in the XPSWMM model developed by Mott MacDonald for the project area to accurately predict the response of the lake (i.e. water surface levels) to the modeled flood events. The stage-storage curve is presented in Figure 6.5-1, and the stage-storage table is included in Appendix D. The development of the HEC-HMS model and the XPSWMM model are discussed below.

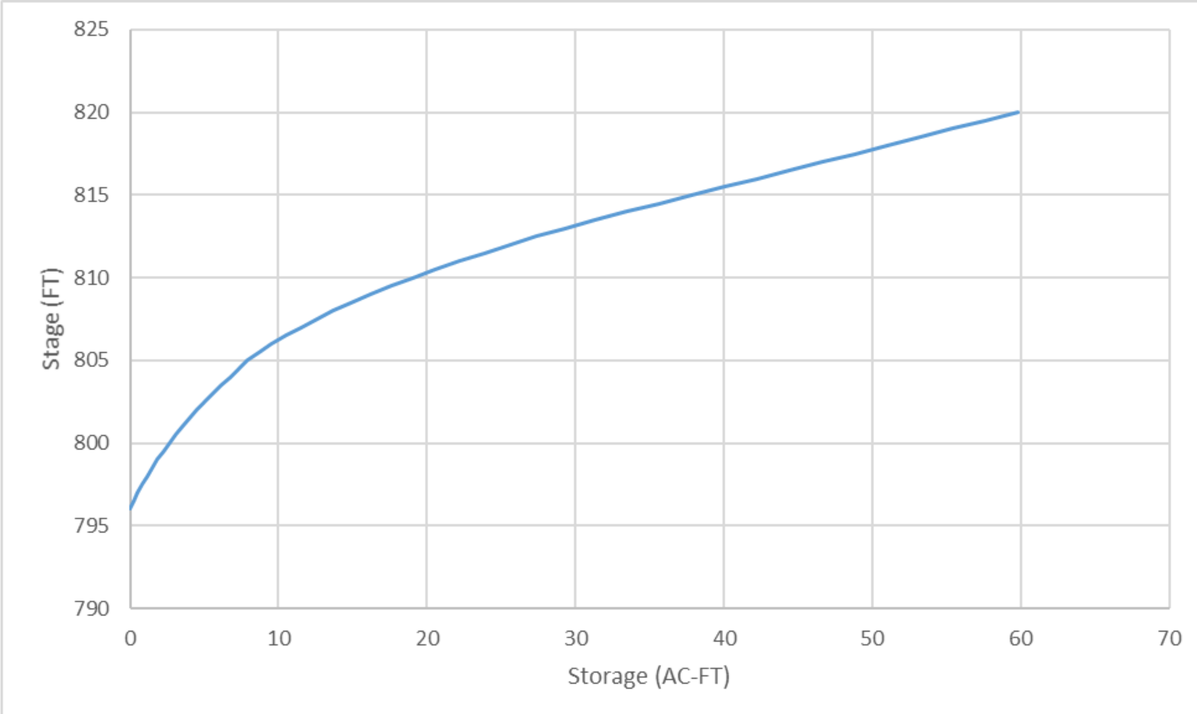


Figure 6.5-1 – Panther Hollow Lake Stage vs. Storage Curve

6.7.2. Watershed Hydrologic Analysis

A hydrologic analysis was performed using Soil Conservation Service (SCS) methods to determine the runoff coefficient and time of concentration associated with the drainage area of Panther Hollow Lake. The hydrologic modeling process selected by CEC utilizes the U. S. Army Corps of Engineers (USACE) Hydrologic Engineering Center's HEC-HMS software to perform the analyses. HEC-HMS version 4.3 was used to simulate the precipitation-runoff process in a stepped drainage area system. Specific site parameters needed to perform this analysis include watershed size, SCS runoff curve number, soil types, and land use.

The watershed size draining to the lake was determined by reviewing USGS topographic mapping and delineating limits of the drainage area. The size of the watershed was delineated to be approximately 390.4 acres or 0.61 square miles. The area of the lake itself is approximately 2.3 acres or 0.0036 square miles or 0.5% of the drainage area.

SCS runoff curve numbers account for the permeability of land uses and soil types in a constant value that is useful in stormwater runoff calculations. The curve numbers were calculated by subdividing the watershed according to land use and soil types. The land uses were established and subdivided by reviewing aerial photography, while the soil types were subdivided using USDA soil mapping. The curve number for the basin draining to Panther Hollow Lake was determined to be 84, and the curve number for the lake area was determined to be 100.

For input into HEC-HMS, and in accordance with the NRCS National Engineering Handbook Chapter 15, Part 630.1502(a) (NEH), 2010, the T_c was then converted to a lag time (L). The following equations were used: 15-4b (for time of concentration), and equation 15-3 of the NEH (for the T_c and L computation).

(Time of Concentration, Equation 15-4b):

$$T_c = \frac{l^{0.8}\,(S+1)^{0.7}}{1{,}140Y^{0.5}}$$

T_c = time of concentration (hr)
l = flow length (ft.)
Y = average watershed land slope (%)
S = maximum potential retention (in), where:

$$S = \frac{1{,}000}{cn'} - 10$$

cn' = the retardance factor based on curve number

(Relation between Lag Time and Time of Concentration, Equation 15-3):

$$T_c = \frac{L}{0.6}$$

L = basin lag time (hours)
T_c = basin time of concentration (hours)

The time of concentration for the drainage area to the reservoir was found to be 51.6 minutes and the lag time was found to be 31.0 minutes. The lag time was input into HEC-HMS for the subbasin using the Soil Conservation Service (SCS) Unit Hydrograph transform method. The T_c inputs and calculation results are included in the Hydrologic and Hydraulic Technical Report in Appendix D.

6.7.3. Routing Inflow Design Hydrograph

The stage storage curve and hydrologic information (watershed size, percentage of impervious land use; SCS runoff curve number; time of concentration) developed above for Panther Hollow Lake was used in the XPSWMM model software. XPSWMM is a piece of hydrologic modeling software used to build 2D models which may be used to simulate the precipitation-runoff processes in a stepped watershed system. The XPSWMM model was simulated under six different 24-hour design storms, the 1-, 2-, 10-, 25-, 50-, and 100-year storm events. Since the ultimate discharge point of the flow exiting the lake is the Monongahela River, the model was ran under normal pool condition (elevation 811 feet, NAVD88) and the 100-year water surface elevation (elevation 833 feet NAVD88) of the Monongahela River to account for any backwater conditions caused by the river.

Three historical storm events were identified based upon investigation of historical flooding in the neighborhood areas downstream of the dam. These storm events are summarized in the table below. The amount of rainfall for various time durations are shown along with the corresponding storm recurrence intervals (RI). All rainfall data shown in the table are taken from a rain gage located approximately 0.75 miles south of the dam and operated and maintained by 3 Rivers Wet Weather (3RWW). The annual recurrence intervals were calculated based on the latest version of NOAA Atlas 14, available online at the NOAA Precipitation Data Server (https://hdsc.nws.noaa.gov/hdsc/pfds/). The highest annual recurrence intervals for each of the storm events are shaded in red.

Time Interval	August 8-9, 2007		June 17, 2009		August 19, 2011	
	Rainfall (in)	RI	Rainfall (in)	RI	Rainfall (in)	RI
15-min	0.53	<1-year	0.51	<1-year	1.12	25-year
30-min	0.88	1.5-year	0.89	1.5-year	1.50	20-year
60-min	0.98	1-year	1.46	5-year	1.82	15-year
2-hr	1.00	<1-year	2.81	75-year	1.85	7.5-year
3-hr	1.00	<1-year	3.04	75-year	1.87	6.5-year
6-hr	1.13	<1-year	3.28	45-year	1.87	3.5-year
12-hr	1.99	2-year	3.29	20-year	1.94	2-year
24-hr	2.32	2-year	24-hr:	3.78	1.94	1-year
2-day	2.56	1.5-year	2-day:	3.79	1.94	<1-year
3-day	2.57	1.25-year	3-day:	3.80	1.94	<1-year

The 100-year, 24-hour storm event was used as the design storm for the modeling analysis.

The XPSWMM program runs multiple calculations at various time intervals to determine multiple aspects associated with the reservoir. These aspects include, but are not limited to:

- Inflow rates over time
- Peak inflow rates
- Outflow rates over time
- Peak outflow rates
- Water surface elevations over time
- Peak water surface elevations

The XPSWMM calculations associated with the above discussion are provided in Appendix D.

6.7.4. Dam Breach Analysis

As required by the PA Code Chapter 105, a dam breach analysis was performed to estimate the potential hazard areas associated with a failure of the dam. The analysis was performed using the HEC-RAS modeling program which was developed by the USACE and performs two-dimensional unsteady, subcritical and supercritical flow modeling for various open channel systems on digital terrain surfaces for determination of flood inundation depths and limits.

Dam breach modeling was completed with input parameters in accordance with the Federal Guidelines for Inundations Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, July 2013). A piping failure breach was analyzed for the 24-hour probably maximum precipitation (PMP), 24-hour 0.5PMP, 100-Year 24-hour, 50-Year 24-hour and Sunny Day conditions scenarios. The dam breach was located along the southwestern corner of Panther Hollow Lake. The detailed analysis and parameter inputs are described in the Hydrologic and Hydraulic Technical Modeling Report included in Appendix D.

Results of the breach analysis are summarized in Table 1 below.

Table 1 Summary of Breach Results

Scenario	Southwest PMF-100YR	Southwest Sunny Day
Breach Trigger	WSEL	WSEL
	814.3	12:00
Pool Elevation at Breach, Initial (ft)	806	806
Time Breach Occurs	12:20	12:00
Breach Type	Piping Failure	Piping Failure
Piping Failure Breach Initial Elevation (ft)	802	802
Storage Volume at Breach (ac-ft)	34.61	9.52

6.7.5. Principal Spillway Pipe System

As required by the PA Code Chapter 105, a principal spillway pipe system was designed for the Panther Hollow Lake dam. The proposed principal spillway pipe system consists of a 30-inch diameter vertical riser section with a 30-inch outlet pipe. The riser and outlet pipe will be constructed of solid wall HDPE. The riser structure rim is set at elevation 806, the normal water surface level of the existing lake.

The spillway pipe size was designed using an iterative process and the same XPSWMM software described above. The pipe was sized to safely pass the 100-year, 24-hour storm event and prevent the activation of the emergency spillway during this storm event. During the 100-year storm event, the 30-inch spillway pipe safely passes 51 cfs of flow, and the maximum water surface elevation in the lake reaches 812.8. This elevation provides 1.2 feet of freeboard from the water surface elevation to the crest of the embankment raise.

Detailed calculations and figures associated with the spillway pipe are presented in Calculation Brief in Appendix E. The plan, section, and details of the spillway pipe system are shown on the drawings.

6.7.6. Low Level Outlet Pipe and Valve

In conjunction with the design of the principal spillway pipe, design of a low level outlet pipe is required in accordance with PA Code Chapter 105, Section 105.96. The outlet pipe size should be capable of draining the top two feet of the reservoir plus 70 percent of the highest mean monthly inflow in 24 hours in an emergency situation. Using the stage storage curves, it was determined that an average flow rate of 1.41 cubic feet per second (cfs) would be required to drain the top two feet of the reservoir. An additional 2.0 cfs would be required to satisfy the highest mean monthly inflow requirement, resulting in a total flow requirement for the bypass drainage device of 3.41 cfs.

The proposed emergency drawdown pipe is a 10-inch HDPE pipe with a gate valve located approximately 80 feet south of the pipe end. The 10-inch pipe is proposed to run parallel to the 30-inch outlet pipe for approximately 100 feet, where it then ties into the 30-inch pipe. The invert of the 10-inch pipe is 800 feet. The 10-inch diameter gate valve will be constructed within a 36-inch inside diameter concrete manhole with a stem guide extending from the gate valve to the top of the manhole to allow for manual operation of the valve outside the manhole. The time required to empty the top two feet of the reservoir and 70 percent of the highest mean monthly inflow was 16.96 hrs, with the gate valve fully opened.

Detailed calculations associated with the low level outlet pipe are presented in Appendix E. The plan, section, and details of the emergency drawdown pipe and valve are shown on the drawings.

6.7.7. Filter Drainage Diaphragm

As discussed in Sections 6.7.5, the principal spillway pipe will extend through the embankment. To intercept potential groundwater seepage that can flow through cracks that may occur in compacted fill surrounding piping or groundwater that may flow along the interface between the pipe and the surrounding fill, a filter drainage diaphragm was designed. The filter diaphragm is crack intercepting and sealing zone, not a drainage zone. The upstream face of the filter diaphragm will collect eroded soil particles carried by flow and prevent further crack flow. The length, width and height of the filter drainage diaphragms were designed in accordance with the National Engineering handbook, Part 628-Dams, using the diameter or geometry of the structure around which it will be built.

Construction of the filter drainage diaphragm will be performed using a trenching method or simultaneous lift method. In the trenching method, fill is spread and compacted to a selected height and a trench is cut to facilitate the placement of the drainage material. In the simultaneous lift method, the filter drainage material is raised at the same rate, with the same lift thicknesses as the fill material. Calculations are provided in the Calculation Brief in Appendix E.

The plan location of the filter drainage diaphragm and details for construction are shown on the Drawings.

6.7.8. Emergency Spillway

As part of the required spillway pipe system, an emergency spillway was designed to convey storm events larger than the 100-year, 24-hour storm. The proposed embankment and emergency spillway were designed such that the emergency spillway is not activated in storm events that are 100-year, 24-hour and less.

To size and design the emergency spillway, it was assumed the principal spillway pipe and emergency drawdown pipe are clogged. The emergency spillway was sized to convey the 100-year, 24-hour storm event to prevent over-topping of the embankment crest and have a 0.3 feet of freeboard. After an iterative design process, the spillway was sized to be 25 feet wide and 1 foot deep with 3H:1V side slopes.

The design of the spillway was performed using HydroCAD software. Detailed calculations associated with the spillway are presented in Appendix E. Plans, sections, elevations, and details of the spillway are shown on the drawings.

Spillway Feature

Maximum Design Flow (cfs)*	**327**
Peak Lake Discharge (cfs)	**51**
Peak Discharge from 100-Yr Events (cfs)	31.01
Increased 100-Yr Outflow Rate (%)	**4.4**
Minimum Dam Crest Elevation (ft)	813
Top of Spillway Elevation (ft)	814
Maximum Water Surface Elevation (ft)	813.7
Total Head (ft)	**0.7**
Spillway Height (ft)	1
Length of Spillway (ft)	15
Spillway Width (ft)	20

6.7.9. Water Quality Analysis

Water quality analysis was not a required design parameter for this project.

6.8. Structural Analysis and Design

A concrete foundation will be required for the principal spillway pipe riser structure and a concrete control section and downchute will be required for the emergency spillway.

References utilized in the design are presented in Section 4.0 of this report. Calculations associated with the structural design of the concrete features, including design loads are presented in the Calculation Brief in Appendix E.

6.8.1. Structure Design

Structural design of hydraulic structures is in accordance with EM 1110-2-2104 for reinforced concrete supplemented by ACI 350-06. Structural design for non-hydraulic structures is in accordance with ACI 318-08.

6.8.2. Design Parameters

The following information was utilized for structural design

Friction at Material Interface

Sliding Friction Factor	0.35	(Geotechnical Report)

Concrete
Compressive strength, f_c' = 4500 psi at 28 days for structural design. Concrete is nevertheless specified to have a compressive strength, f_c' = 5000 psi at 28 days to improve durability.

Reinforcing Steel
ASTM A615 Grade 60, uncoated, unless noted otherwise
ASTM A706, uncoated, only where noted for welding
Minimum concrete cover:

Location	Minimum Cover (in)
Surfaces subject to abrasion by flowing water	6
Unformed concrete placed against earth	4
Surfaces to be in contact with earth or water:	
Less than or equal to 2 foot thick	3
Greater than 2 foot thick	4
All other places	2

Dead Load Unit Weights (D)

Reinforced Concrete	150 pcf
Steel	490 pcf
Water	62.4 pcf

Uplift Loads (U)
The location of the emergency spillway is above the groundwater elevation presented in the Geotechnical Report. Uplift forces associated with stormwater elevations are only present during the peak portion of the hydrograph, which is less than 6 hours. Therefore uplift forces are considered negligible.

Earth (H)
Refer to the Geotechnical Report in Appendix C for detailed soil parameters and testing results.

Wind Loads (W)
Wind loads are not considered to be a controlling factor in the design of the structure.

Snow Loads (S)
Snow loads are not considered to be a controlling factor in the design of the structure.

Flood Loads (Fa)
Stream pressure and wave loads are not considered. Loads defined specifically of Flood Loads (Fa) are not considered.

Earthquake Loads (EQ)
For the structural components, design for earthquake loading is not to be considered. Based on USACE EM 1110-2-2200, Gravity Dam Design, Section 3-3 Loads, Item (1) General, paragraph (a):

The earthquake loadings used in the design of concrete gravity dams are based on design earthquakes and site-specific motions determined from seismological evaluation. As a minimum, a seismological evaluation should be performed on all projects located in seismic zones 2, 3, and 4. Seismic zone maps of the United States and Territories and guidance for seismic evaluation of new and existing projects during various levels of design documents are provided in ER 1110-2-1806, Earthquake Design and Analysis for Corps of Engineers Projects.

Referencing Figure C-1 the Seismic zone map of the United States found in ER 1110-2-1806, the site is located in zone 1 therefore a seismological evaluation is not warranted. Nonetheless earthquake loading was determined to use with the PA Code load combinations. The seismic response coefficient for the dam was determined using ASCE 7-05 procedures. Two types of earthquake loads, inertia forces and hydrodynamic forces, were determined based on EM 1110-2-2200.

6.8.3. Miscellaneous Design Requirements

6.8.3.1. Joints and Waterstops

Expansion joints and contraction joints will be required during design of the emergency spillway to reduce the risk of crushing or spalling of the concrete along these interfaces due to thermal expansion and differential movement. Contraction joints are located along all of the spillway structure at a spacing of approximately 12 and 25 feet to control cracking. Waterstops have been provided along all joints to produce a water tight structure. At locations where waterstops need to join at two different angles or where different size waterstops meet or join, the use of split waterstops will be prohibited.

6.8.3.2. Concrete Finish Evaluation

The class of concrete finish was evaluated for construction of the emergency spillway structure. Based upon EM 1110-2-2000 "Standard Practice for Concrete for Civil Works Structures", a Class AHV Finish is a special finish that was developed by the USACE for spillways or other water passages where the velocity of the water is expected to be 40 feet per second or greater. The materials and workmanship for forming the Class AHV Finish is the same as a Class A Finish, except the use of steel forms is permitted with the Class AHV Finish and the allowances for offsets are more restrictive. Due to the restrictive nature and the increased construction cost associated with the use of the Class AHV Finish, all concrete structures will be constructed with a Class A Finish on all surfaces exposed to view and a Class D Finish on all surfaces against which backfill will be placed.

6.9. Analysis of Embankment Raise

6.9.1. Lake Embankment Area

An analysis of the stability of the proposed embankment raise is required by PA Code Chapter 105, Section 105.97. The proposed embankment raise consists of a 15 foot wide crest with a downstream side slope of three horizontal to one vertical (3H:1V) and an upstream side slope that varies between 3H:1V and 8H:1V. The height of new fill proposed for the embankment raise will vary between 6 feet and 8.5 feet and will create a uniform crest elevation over the entire 530 linear feet of embankment of 814 feet. A minimum 15 feet wide embankment core will be constructed using structural cohesive fill from an elevation two feet below the existing ground surface of the embankment to the crest of the proposed embankment raise at elevation 814 feet. General fill will be used to grade the shallower slopes of the embankment raise. A plan and section of the embankment is presented on the Drawings.

To determine if the existing slopes to remain and the proposed slopes of the embankment raise will be stable after construction and during variations in water surface elevations in the lake associated with stormflow, an analysis of the geometry of the slope, the strength parameters of the existing and proposed embankment soils, and the location of groundwater must be performed. A stability analysis to determine the factor of safety with respect to these conditions was performed.

The analysis was performed using the SLIDE computer software program, developed by Rocscience. The program provides a general solution of slope stability using two-dimensional limit equilibrium methods. The program calculates a factor of safety, which indicates whether or not the proposed embankment will fail under the worst service conditions for which it was designed. Failure of a slope is defined as the downward or outward movement of a slope and occurs when driving forces acting on the slope exceed the resisting forces. Movement may be caused by several conditions: a gradual disintegration of the structure of the soil, an increase in pore water pressure, or a modification of the slope. The analysis utilized the results of the laboratory testing to establish soil parameters and soil geometry needed for the generation of input and the development of tabular and graphical output.

The SLIDE software utilizes an Auto Refine Search Method for locating the global minimum safety factor for circular slip surfaces. The Auto Refine Search method is different from other search methods in SLIDE because the search for the lowest safety factor is refined as the search progresses. An iterative approach is used so that the results of one iteration are used to narrow the search area on the slope, in the next iteration. The Auto Refine Search method is a simple but effective algorithm for locating the global minimum circular slip surface. The Auto Refine Search method works as follows:

1. First, the slope surface, as defined by the Slope Limits, is divided into a number of divisions.
2. Circles are then generated between each pair of divisions.
3. The safety factors are then calculated for these circles and the lowest safety factor associated with each division along the slope is recorded.
4. This constitutes one iteration of the Auto Refine Search method.
5. The divisions with the lowest recorded factors of safety are then subdivided and the process is repeated.

A surface filter allows the user to put a limit on the elevation of the search, resulting in the search only looking for failure surfaces above a user-defined elevation. A minimum depth option also exists. Surfaces with a depth less than this value are filtered out of the analysis. This allows the user to ignore shallow failure surfaces.

The factor of safety calculated by SLIDE was compared against acceptable factors of safety published in applicable code standards. Table 6-1b of EM 1110-2-1913 provides the following minimum factors of safety for earthfill dams:

Condition	Required Factors of Safety
End of Construction	1.3
Sudden Drawdown	1.2
Long-Term (Steady Seepage)	1.4

PA Code Chapter 105, Section 105.97 (c.) provides the following minimum factors of safety.

Condition	Required factors of Safety
Normal Pool with steady state seepage	1.5
Maximum Pool with steady state seepage	1.4
Sudden drawdown	1.2

Cross-sections of the embankment for design were developed using the information obtained during the geotechnical investigation. Consideration was given to the vertical height of the slope, the minimum and maximum elevation of the water surface associated with low flow and high flow periods, the type of soil that the slope will be constructed with, the various soil zones and the depth to bedrock to arrive at a preliminary section for analyses. Using these variables, the section discussed above was developed.

The location of the phreatic surface within the embankment was determined using the elevation of the groundwater documented during the subsurface investigation or professional judgment when evaluating worst case hydrostatic conditions. A finite element model was developed to estimate the steady-state groundwater conditions. The horizontal permeability was assumed to be 2 times greater than the vertical permeability for the newly placed fill soils. These are conservative assumptions, which will increase the seepage through the embankment in the stability model, which will decrease the stability factor of safety.

This finite element groundwater model was evaluated to estimate the phreatic surface in steady-state conditions and then the minimum FS for slope stability was estimated using the steady-state phreatic surface.

The stability of the upstream and downstream slopes was evaluated using the following scenario/load conditions.

Load Condition/Scenario 1 and 4 – Normal Lake Elevation/Normal Embankment Phreatic Surface: This is the most common condition, occurring when the lake is at its normal pool elevation and a phreatic surface is established through the embankment, based upon the elevation of the water table identified during performance of the subsurface investigation. A static (Load Condition 1) and seismic (Load Condition 4) analysis were performed.

Load Condition/Scenario 2 – Normal Lake Elevation/ Elevated Embankment Phreatic Surface: This is the worst case scenario, occurring after a flood of adequate duration has increased the phreatic surface within the embankment to an elevation equal to the top of the embankment. The floodwater in the lake then recedes quickly to normal pool elevation, thereby creating an embankment that is fully saturated with no lateral water forces.

Load Condition/Scenario 3 – Lake at Flood Elevation/ Normal Embankment Phreatic Surface: This scenario assumes the lake water level is at normal pool elevation and has a rapid drawdown to being empty.

Load Condition/Scenario 5 – Post Construction/Existing Phreatic Surface: This scenario assumes the lake is empty and all grading is complete. The phreatic surface is based on the water levels determined from the installed piezometers.

Material parameters used in this analysis were based on site specific laboratory testing, published values for typical soils, and our experience with similar materials. New fill for the embankment will consist of cohesive low permeability fill (Structural Cohesive Fill) will be placed to construct the core of the Panther Hollow Lake dam. The remaining fill will consist of general site fill (General Fill). These material parameters are shown in Table 2.

Table 2 –New Fill Material Parameters

Material Type	Unit Weight (pcf)	Angle of Friction (degrees)	Cohesion (psf)	Permeability (cm/sec)
Structural Cohesive Fill	125	20	100	1×10^{-6}
General Fill	125	20	75	1×10^{-5}

The existing fill on site is predominantly fine-grained (i.e. low to highly plastic silts and clays) towards the existing ground surface and has an increase in sand content with an increase in depth. Zones of coarse-grained material were noted a varying depths in the test borings logs. The existing fill parameters used in the analysis are as follows:

Table 3 – Existing Fill Material Parameters

Material Type	Unit Weight (pcf)	Effective Angle of Friction (degrees)	Effective Cohesion (psf)	Permeability (cm/sec)	Undrained Cohesion (psf)	Undrained Cohesion Increase With Depth (psf/ft)
Existing Fill	101	33.7	144	1.29×10^{-5}	764	6

6.9.2. Conclusions

Based on the calculated and minimum factors of safety which are shown in Table 4, all of the analyzed scenarios meet or exceed the minimum factors of safety per the Pennsylvania Code. The proposed cut and fill slopes for the embankment should be stable if constructed in accordance with the design specifications.

Table 4 – Stability Analysis Summary

	Calculated FS	Minimum FS
Scenario #1	2.91	1.5
Scenario #2 – Downstream Slope	2.38	1.4
Scenario #2 – Upstream Slope	2.91	1.4
Scenario #3	3.15	1.2
Scenario #4	2.57	1.1
Scenario #5	3.20	1.3

The printed output for the stability analyses, the graphical presentation of the factors of safety associated with the critical failure surface, and additional discussion of the analysis is presented in the Geotechnical Report in Appendix C.

6.10. Water Line Relocation

An existing 15-inch diameter waterline will need to be relocated as a result of this proposed project. The existing waterline is located directly beneath the proposed dam embankment. The proposed waterline alignment is shown on the drawings. The waterline will be relocated outside of the embankment limits to allow for future maintenance on the waterline without disturbing and affecting the integrity of the embankment.

7. CONSTRUCTABILITY, PERMITTING, OPERABILITY, AND MAINTENANCE

7.1. General

As discussed in section 6.3 of this report, the Panther Hollow Lake will be dewatered to allow for the excavation of soils/sediment within the lake and return it to conditions that may have existed during original construction. Dewatering will also allow for construction of the Treatment Wetlands at the east side of the lake. The treatment wetland provides additional wetland area to the project and improves water quality prior to the water entering the lake. The lake will provide greater storage capacity as a result of the excavation of years of sediment accumulation, which aids in protection of downstream residents against flooding during storm events and also creates a healthier condition for plants and fish habitat. This approach provides an economic and constructability savings when compared to hydraulic dredging, which does not reduce moisture contents of soils/sediment that are excavated or regraded.

7.2. Constructability

The majority of the work associated with this project involves the need to excavate or place fill, as well as, the use of cast-in-place and precast concrete. The principal spillway pipe and emergency spillway open channel require the placement of cast-in-place concrete. Steel reinforcement will be installed for structural support of the cast-in-place concrete and formwork will be constructed to obtain the proper design geometry. Precast concrete manhole structures will be utilized at two locations. These will be provided by precast concrete manufacturers.

The majority of the excavation and placement of earth will be performed in prior to concrete activities. Excavation will be performed within the footprint of the existing lake, the forebay pond area and the Treatment Wetland area. Excavation to install the emergency spillway pipe will also be performed.

Overexcavation will be performed on the existing dam embankment where the embankment raise is to be constructed. Overexcavation will involve removing two feet of soil from the top of the existing embankment where the embankment core component of the embankment raise is to be constructed and replacing the overexcavation with compacted select fill. Embankment details are provided in the drawings. .

Fill placement will be performed during construction of the embankment raise and at various locations around the perimeter of the lake. Two types of fill will be placed. Structural cohesive fill will be used in the embankment core to raise the crest elevation to 814 feet. This material may be available on-site or it may be imported from an off-site borrow location. General fill will be utilized at other fill locations.

Earthmoving and concrete work use conventional construction techniques. The procedures associated with preparing and performing tasks using these construction materials is moderately easy. The relatively small work area may allow for limited use of dump trucks to move material from one location to another. Excavating equipment that can also haul short distances may be utilized. The concrete work is primarily surface concrete placement with easy access to the concrete placement locations. Reinforcement within the concrete requires no intricate bends and will be easy to install, either in mats or in individual bars. Waterstops will be required in joints associated with the emergency spillway. Installation of these items requires modification to formwork to facilitate extension of the waterstop to an adjacent concrete slab.

Placement of the waterstop and joining will be performed at the locations shown on the drawings and according to the manufacturers installation guide.

In addition to the concrete and earthwork described above, other ancillary tasks include installation of piping and valves, demolition of existing structures, installation of riprap erosion protection and vegetation of disturbed areas. These activities are also moderately easy to complete and utilize common non-complicated construction techniques. The pipe to be utilized will be High Density Polyethylene (HDPE) pipe with butt fusion joints. The joining method requires relatively specialized equipment and labor. Elbows required for the pipe installation will be factory manufactured and delivered to the site. HDPE pipe allows some flexibility in location, as a result of its ability to bend slightly and will facilitate easy connection to fixed structures.

The most challenging aspect of the proposed project is site access, due to the very steep topography surrounding the site on the north, south and east sides, the park setting and the railroad tracks bordering the site on the west side of the lake. Mobilizing equipment and hauling material to and from the site will require smaller equipment. Four site access routes have been identified; two of which will require CSX permission. The third access route utilizes park paths and trails and may be difficult due to the need to maintain public access through the park. The fourth access involves grading down a moderately steep slope north of the lake and removing several trees. It will be the Contractor’s responsibility to provide a viable access route to the site.

7.3. Permitting

A PADEP Dam Safety Permit application will be prepared and submitted in accordance with PA Code Chapter 105 in conjunction with this Design Report presenting the proposed rehabilitation activities related to the dam and lake.

A National Pollution and Discharge Elimination System (NPDES) for construction activities application will be submitted to the Allegheny County Conservation District to address the procedures for controlling pollution during construction. Appropriate Erosion and Sediment Control measures are discussed and illustrated within the NPDES application. Upon approval of and receipt of the NPDES permit letter from ACCD, the approval letter will be sent to PADEP.

An Erosion and Sediment Control Plan application will be submitted to the Allegheny County Conservation District. The plan is needed for construction activities in excess of one acre in size.

An Environmental Assessment has been prepared to meet regulatory criteria under Title 25 of the Pennsylvania Code, Chapter 105, Subchapter B Dams and Reservoirs. It also is required in order to obtain compliance under a 2008 consent decree from the U.S. Environmental Protection Agency (EPA) and state and federal laws that mandate reduction and elimination of sewage contamination from local rivers and streams. The Environmental Assessment is attached as Appendix G.

7.4. Operability

Operations of the Panther Hollow Lake Dam are minimal. The concrete emergency spillway is a fixed crest structure, and does not possess any moving appurtenances. The proposed low level outlet pipe and valve located on the south side of the lake will need to be operated at least once per year. At a minimum, this would occur at the annual inspection, in accordance with PA Code Chapter 105. An Emergency Action Plan (EAP) for the Panther Hollow Lake Dam will be prepared and provided to PADEP under separate cover.

7.5. Maintenance

In addition to the periodic Owner and PADEP inspection, routine visual inspections of the structure will be performed after a rainfall event exceeding a 10 year 24 hour storm event to verify that the structure is operating as intended. Locations to be observed will include the emergency spillway concrete structure, the principal spillway riser structure, the forebay pond and the Treatment Wetlands. Maintenance of these areas will be initiated if conditions vary from those previously reported or as designed. An Operation, Maintenance and Inspection (OM&I) Manual will be prepared and provided to PADEP under separate cover.

8. DRAWINGS AND SPECIFICATIONS

The drawings associated with the design of the Project have been developed using the preliminary drawings developed for the PDM. Drawings have been updated to represent the proposed design. The drawing numbers for the appropriate submission and the corresponding drawing titles are presented in a Drawing List in Appendix F.

Information contained within the Project Specifications include Technical Specifications from the Construction Specifications Institute (CSI) and the Unified Facilities Guide Specifications (UFGS), including Division 01 – General Requirements, Division 02 – Existing Conditions, Division 03 – Concrete, Division 31 – Earthwork, Division 32 – Exterior Improvements, Division 33 – Utilities and Division 35 – Waterway and Marine Construction. Front end specifications, including those of Division 00 – Procurement and Contracting Requirements, will be provided by PWSA. The Bid Form from Division 00 – Procurement and Contracting Requirements is attached as Appendix F. The Project Specifications is attached as Appendix F.

9. QUANTITIES, CONSTRUCTION SEQUENCE AND SCHEDULE

9.1. Quantity Estimate

A detailed quantity estimate, including summary sheets, has been developed for all work features. The quantities are provided in the calculation Brief in Appendix E. The quantity estimate includes all sketches, calculations, assumptions, and backup information required to support the quantities listed on the quantity summary sheets. As applicable, references to drawings are included.

9.2. Construction Sequence and Procedures

Construction sequencing for of the Project will be performed based on the Contractor's preferred method of construction using the information as presented in the drawings and specifications. PWSA will rely, in part, on the experience of the Contractor and their performance on projects involving similar scope to establish a cost effective and economical construction process. The construction sequence would consider the use of this contract in identifying the activity, the duration, and the timing of the work. Some general construction items that will need to be considered include the following:

- Mobilization of Equipment
- Survey to establish contractor work limits and control points for construction
- Dewatering of the lake to accommodate "in-the-dry" construction
- Diversion berming to route streamflow and stormwater around the lake
- Installation of temporary construction facilities
- Installation of temporary erosion and sediment pollution (E&S) control measures
- Clearing, grubbing, tree removal, and topsoil stripping
- Demolition/removal of the existing features needed for construction
- In-the-dry excavation of lake soils/sediment, grading of Treatment Wetlands and construction of forebay pond
- Construction of embankment raise and general fill placement around lake
- Construction of a new concrete emergency spillway
- Construction of a new principal spillway pipe system and emergency drawdown pipe
- Vegetating disturbed areas
- Removal of temporary E&S control measures
- Removal of diversion berming and natural rewatering of the lake to the normal water surface level
- Final Inspection

9.3. Construction Schedule

As part of the DR, a schedule for construction of the Project was developed. The schedule was developed using the information presented in this DR, information from PWSA, and the design drawings and specifications. The construction schedule is presented in Appendix F.

The schedule lists tasks and approximate start and finish dates. It does not identify predecessors and successors or develop float for overlapping tasks. Based upon the schedule provided, the Notice to Proceed is anticipated to be awarded in June 2020 with construction completion anticipated to be in December 2021. However, several factors may influence the schedule for construction which are briefly discussed below.

1. Permitting Process: Prior to the start of construction, the following permits are required for construction:
    a. General NPDES Permit (PAG-02) for Stormwater Discharges Associated with Construction Activities
    b. Erosion and Sediment Control Application
    c. PADEP Dam Safety Permit

    The time needed by State agencies to review and approve permits cannot be quantified. Review time is affected by the workload of the agency, the level of detail applied by the reviewer to the permit, the time required to address comments, and the number of cycles that comments are generated.

2. Drawdown of Lake: The rate at which the reservoir can be drawn down is subject to requirements established by PADEP and the PAF&BC. This drawdown, in conjunction with any additional groundwater or precipitation entering the lake, may impact the time to completion.

3. Unknown Subsurface Conditions: Although a subsurface investigation was performed, the potential exists for conditions to be different than that identified in the several borings advanced throughout the project site.

APPENDIX A

APPLICATION FOR A DAM PERMIT (SECTION 1.4)

3140-PM-BWEW0001 Rev. 6/2018

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

Coordination #

APPLICATION FOR A DAM PERMIT

Before completing this form, read the step-by-step instructions provided with this Dam Permit Application package.

AGENCY USE ONLY

Application ID# (Assigned by DEP) ________ RECEIVED DATE ________ CHECK NO. ________

Program Application No. ________ REQUIRED APP. FEE ________ AMOUNT $ ________

SECTION A. APPLICANT IDENTIFIER

Applicant Name: CITY OF PITTSBURGH

SECTION B. PROJECT LOCATION DATA

Name of stream and/or body of water. **Panther Hollow Lake**

Corps District where project will occur.

☐ Baltimore ☐ Philadelphia ☒ Pittsburgh

Name of the U.S.G.S. 7½ Minute Quadrangle Map where project is located: 40079D8, Pittsburgh East

Indicate location of project on this map by measuring (in inches) from the lower left corner:

North:(up) 7 inches; East (to the right) 5 inches; Latitude: 42.4369 Longitude: 79.9492

Project purpose and need.: Construction is required to bring existing dam into compliance with PADEP regulations-Title 25, Chapter 105, Subpart B-Dams and Reservoirs. See Project Narrative and Design Report for additional information.

SECTION C. PROJECT DATA

Application Type:

☐ New Dam ☒ Modification of Existing Dam ☐ Operation & Maintenance of Existing Dam

Drainage Area to Dam 200 (acres) or (square miles) Maximum Depth to Top of Dam 10 feet

Crest Length 500 feet

Impoundment Surface Area:
at normal pool 2 acres
at top of dam 4 acres

Storage Volume:
at normal pool 9 acre-feet
at top of dam 33 acre-feet

Will/Does the dam store a fluid or semi-fluid other than water?

☐ Yes ☒ No

Size Category:

☐ A ☐ B ☒ C

Hazard Potential Category:

☐ 1 ☐ 2 ☒ 3 ☐ 4

Hazard Potential Category Justification Breach Analysis performed in accordance with PADEP Guidance document entitled "Guidelines for Performing an Incremental Dam Breach Analysis and Downstream Inundation Study"

SECTION D. DETERMINATION OF APPLICATION FEES (DEP FEES ONLY)

The fee required for a project authorized under this permit shall be consistent with 25 Pa. Code § 105.13 (relating to regulated activities – information and fees). To determine the application fee, please complete the Chapter 105 Fee(s) Calculation Worksheet (3150-PM-BWEW0553). Submission of this worksheet is optional. Please provide the completed worksheet and a check for the applicable fee(s) made payable to the "Commonwealth of Pennsylvania Clean Water Fund."

SECTION E. APPLICATION COMPLETENESS CHECKLIST

(Applicant must place an entry – Y = Yes, N = No, N/A = Not Applicable – in each left side column space. See Sections 105.13, 105.13a, 105.13b, 105.14, 105.15, 105.81, and 105.82 for additional details.)

REQUIREMENT	Applicant Entry	DEP Use Only
1. Permit application properly signed, sealed and witnessed	Y	
2. Completed Permit Application and General Information Form	Y	
3. Application Fee (Worksheet 3150-PM-BWEW0553 is optional)	Y	
4. Copies and proof of receipt – Act 14 notification	Y	
5. PHMC Project Review Form	Y	
6. Completed PNDI Form (see instructions)	Y	
7. Site Plan (including cross sections and location maps)	Y	
8. Project description narrative	Y	
9. Color photographs with map showing locations taken	Y	
10. Erosion and Sedimentation Control Plan and approval letter (see instructions)	Y	
11. Hydrologic and hydraulic analysis	Y	
12. Stormwater Management Analysis w/consistency letter	Y	
13. Floodplain Management Analysis w/consistency letter	N/A	
14. Risk Assessment	N/A	
15. Environmental Assessment form	Y	
16. Alternatives Analysis	Y	
17. Mitigation plan	N/A	
18. Proof of title or adequate flowage easements (see instructions)	Y	
19. Data on site and construction materials	Y	
20. Design drawings, reports and technical construction specifications	Y	
21. Emergency Action Plan (May submit after approval of breach analysis)	Y	
22. Instrument performance monitoring plan	N/A	
23. Proof of financial responsibility (see instructions)	N/A	
24. Data on chemical content, viscosity and other characteristics	N/A	
25. Operation and Maintenance Manual	Y	
26. Copies of most recent inspection reports	N/A	
27. Professional engineer's embossed seal and certification	Y	
28. Proposed time for commencement and anticipated start of construction	Y	

FAILURE TO PROVIDE ALL THE REQUIRED INFORMATION WILL DELAY THE PROCESSING OF THE APPLICATION AND MAY RESULT IN THE APPLICATION BEING PLACED **ON HOLD** WITH **NO ACTION**, OR IT MAY BE CONSIDERED WITHDRAWN AND THE FILE CLOSED, RESULTING IN FORFEITURE OF THE APPLICATION FEE.

SECTION F. OTHER APPROVALS

LIST APPLICATIONS MADE AND APPROVALS, CERTIFICATIONS, DENIALS OR NOTICES OF VIOLATION RECEIVED FROM FEDERAL, INTERSTATE, STATE OR LOCAL AGENCIES FOR STRUCTURES, CONSTRUCTION DISCHARGES OR OTHER ACTIVITIES DESCRIBED IN THIS APPLICATION.

Joint Permit Application prepared for review by Southwest District of PADEP. The project area excludes the area covered under this Application for a Dam permit.

National Pollutant Discharge Elimination System Permit Application prepared for review by Allegheny County Conservation District.

SECTION G. CERTIFICATION AND SIGNATURE

If Privately Owned, all owners (such as husband and wife) must sign. One or more members authorized to sign on behalf of an entire partnership must sign. For a Corporation, the president, vice president or other responsible official is required to sign. For Political Subdivision, signatures of a chief officer or other responsible official empowered to sign is required with the seal affixed and attested by the clerk. For Commonwealth departments, boards, commissions, receivers, trustees and authorities, a department head, bureau director, executive director, chairman, commissioner or other responsible official is required to sign. Signatures other than above must be accompanied by a power of attorney or other notarized legal documentation indicating authorization to sign on behalf of the applicant.

Application is hereby made for a permit to authorize the activities described herein. I certify I am familiar with the information contained in this application, and to the best of my knowledge and belief, such information is true, complete and accurate. I further certify I possess the authority to undertake the proposed activities.

I grant permission to the agencies responsible for authorization of this work, or their duly authorized representative, to enter the project site for inspection purposes during working hours. I will abide by the conditions of the permit or license if issued and will not begin work without the appropriate authorization.

BY: ______________________
(PRINT NAME)

______________________ ______
(SIGNATURE) (DATE)

SEAL

____
(TITLE)

WITNESS: ______________________

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)

Client ID# ____ **APS ID#** ____
Site ID# ____ **Auth ID#** ____
Facility ID#

DEP USE ONLY
Date Received & General Notes

CLIENT INFORMATION

DEP Client ID# | **Client Type / Code** AUTH

Organization Name or Registered Fictitious Name: City of Pittsburgh | **Employer ID# (EIN)** | **Dun & Bradstreet ID#**

Individual Last Name | **First Name** | **MI** | **Suffix** | **SSN**

Additional Individual Last Name | **First Name** | **MI** | **Suffix** | **SSN**

Mailing Address Line 1 | **Mailing Address Line 2**

Address Last Line – City: Pittsburgh | **State**: PA | **ZIP+4** | **Country**: USA

Client Contact Last Name | **First Name** | **MI** | **Suffix**

Client Contact Title | **Phone** | **Ext**

Email Address | **FAX**

SITE INFORMATION

DEP Site ID# | **Site Name**: Panther Hollow Lake

EPA ID# | **Estimated Number of Employees to be Present at Site**

Description of Site
Existing pond located within Schenley Park.

County Name: Allegheny | **Municipality**: Pittsburgh | **City** ☒ **Boro** ☐ **Twp** ☐ | **State**

County Name | **Municipality** | **City** ☐ **Boro** ☐ **Twp** ☐ | **State**

Site Location Line 1: Schenley Park | **Site Location Line 2**

Site Location Last Line – City: Pittsburgh | **State**: PA | **ZIP+4**: 15213

Detailed Written Directions to Site
From I-376 W, take exist 73B, Turn right onto Boulevard of the Allies, turn right onto the Panther Hollow Rd. ramp, continue onto Frank Curto Dr./Schenley Dr., turn left onto Frew St. Ext, access the vehicle access road through the gates, follow trail down to the lake.

Site Contact Last Name | **First Name** | **MI** | **Suffix**

Site Contact Title | **Site Contact Firm**

Mailing Address Line 1 | **Mailing Address Line 2**

Mailing Address Last Line – City	State	ZIP+4
Pittsburgh	PA	

Phone	Ext	FAX	Email Address

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)

Client to Site Relationship
OTHER, the owner of the site is the City of Pittsburgh. PWSA is the regulatory agency performing the project which requires upgrades to the lake on the City's property.

FACILITY INFORMATION

Modification of Existing Facility	Yes	No
1. **Will this project modify an existing facility, system, or activity?**	☒	☐
2. **Will this project involve an addition to an existing facility, system, or activity?**	☒	☐

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☐	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	Mine DrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☒	Dam Location		☐	Oil & Gas Wastewater Storage Impoundment	
☐	Deep Mine Safety Operation -Anthracite		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Bituminous		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Residual Waste Operation	
☐	Encroachment Location (water, wetland)		☐	Storage Tank Location	
☐	Erosion & Sediment Control Facility		☐	Water Pollution Control Facility	
☐	Explosive Storage Location		☒	Water Resource	
			☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	42	26	13	79	56	57

Horizontal Accuracy Measure Feet --or-- Meters

Horizontal Reference Datum Code
☐ North American Datum of 1927
☒ North American Datum of 1983
☐ World Geodetic System of 1984

Horizontal Collection Method Code

Reference Point Code

Altitude Feet --or-- Meters

Altitude Datum Name
☐ The National Geodetic Vertical Datum of 1929
☐ The North American Vertical Datum of 1988 (NAVD88)

Altitude (Vertical) Location Datum Collection Method Code

Geometric Type Code

Data Collection Date

Source Map Scale Number Inch(es) = Feet
--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
Panther Hollow Lake Dam Rehabilitation

Project Description
Rehabilitation of the existing Panther Hollow Lake and earthen dam. Work includes dredging of the existing lake, excavation and fill, earthen embankment raise, installation of spillway pipe, and restoration of disturbed areas.

Project Consultant Last Name	First Name	MI	Suffix
Sullivan	Patrick	J.	P.E.

Project Consultant Title		Consulting Firm	
Principal		Civil and Environmental Consultants, Inc.	
Mailing Address Line 1		**Mailing Address Line 2**	
333 Baldwin Road			
Address Last Line – City		**State**	**ZIP+4**
Pittsburgh		PA	15205
Phone	**Ext** **FAX**	**Email Address**	
412-249-1574		psullivan@cecinc.com	

Time Schedules	Project Milestone (Optional)
06-20-2020	Anticipated Project commencement
12-31-2020	**Anticipated Project completion**

1. **Have you informed the surrounding community and addressed any concerns prior to submitting the application to the Department?** ☒ Yes ☐ No
2. **Is your project funded by state or federal grants?** ☐ Yes ☒ No
   Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.
   Aspect of Project Related to Grant
   Grant Source: ______
   Grant Contact Person: ______
   Grant Expiration Date: ______
3. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☐ Yes ☒ No
   Note: If "No" to Question 3, the application is not subject to the Land Use Policy.
   If "Yes" to Question 3, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☐ Yes ☐ No
2. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☐ Yes ☐ No
3. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☐ Yes ☐ No
   Note: If the Applicant answers "No" to either Questions 1, 2 or 3, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below.
   If the Applicant answers "Yes" to questions 1, 2 and 3, the Applicant should respond to questions 4 and 5 below.
4. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☐ Yes ☐ No
5. **Have you attached Municipal and County Land Use Letters for the project?** ☐ Yes ☐ No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No

3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☐ Yes	☒ No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐ Yes	☐ No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐ Yes	☐ No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐ Yes	☐ No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage. **4.0.1 Total Disturbed Acreage** 6	☒ Yes	☐ No
5.0	**Does the project involve any of the following?** If "Yes", respond to 5.1-5.3. If "No", skip to Question 6.0.	☒ Yes	☐ No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☒ Yes	☐ No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☒ Yes	☐ No
5.3	**Floodplain Projects by the commonwealth, a Political Subdivision of the commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐ Yes	☒ No
6.0	**Will the project involve discharge of stormwater or wastewater from an industrial activity to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☐ Yes	☒ No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☐ Yes	☒ No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. **8.0.1 Estimated Proposed Flow (gal/day)**	☐ Yes	☒ No
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☐ Yes	☒ No
	9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐ Yes	☐ No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). **10.0.1 Gallons Per Year (residential septage)** ______ **10.0.2 Dry Tons Per Year (biosolids)** ______	☐ Yes	☒ No

11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. **11.0.1 Dam Name** Panther Hollow Lake Dam	☒ Yes	☐ No
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. **12.0.1 Dam Name** Panther Hollow Lake Dam	☒ Yes	☐ No
13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** If "Yes", identify each type of emission followed by the amount of that emission. **13.0.1 Enter all types & amounts of emissions; separate each set with semicolons.**	☐ Yes	☒ No
14.0	**Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes", check all proposed sub-facilities. **14.0.1 Number of Persons Served** **14.0.2 Number of Employee/Guests** **14.0.3 Number of Connections**	☐ Yes	☒ No
	14.0.4 Sub-Fac: Distribution System	☐ Yes	☐ No
	14.0.5 Sub-Fac: Water Treatment Plant	☐ Yes	☐ No
	14.0.6 Sub-Fac: Source	☐ Yes	☐ No
	14.0.7 Sub-Fac: Pump Station	☐ Yes	☐ No
	14.0.8 Sub Fac: Transmission Main	☐ Yes	☐ No
	14.0.9 Sub-Fac: Storage Facility	☐ Yes	☐ No
15.0	**Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?**	☐ Yes	☒ No
16.0	**Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. **16.0.1 Supplier's Name**	☐ Yes	☐ No
	16.0.2 Letter of Approval from Supplier is Attached	☐ Yes	☐ No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body?** If "Yes", should reference both Water Supply and Watershed Management. **17.0.1 Stream Name**	☐ Yes	☒ No
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. **18.0.1 Type & Amount**	☐ Yes	☒ No
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?**	☐ Yes	☒ No
20.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **20.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **21.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No

22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **<u>Note</u>:** Applicant may need a Storage Tank Site Specific Installation Permit. **22.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
23.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **<u>Note</u>:** Applicant may need a Storage Tank Site Specific Installation Permit. **23.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
24.0	**Will the intended activity involve the use of a radiation source?**	☐ Yes	☒ No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name ______________________

______________________ ______________________ ______________________
Signature **Title** **Date**

APPENDIX B

WETLAND AND STREAM DELINEATION REPORT (SECTION 5.2.5)

Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

WETLAND AND WATER RESOURCES REPORT

Prepared For:

The City of Pittsburgh, Department of Public Works
Parks Maintenance Division
and
Pittsburgh Water and Sewer Authority

Prepared By:

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

Permit

Wetland and Water Resources Delineation Report
The City of Pittsburgh, Department of Public Works and Pittsburgh Water and Sewer Authority
Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

On behalf of Pittsburgh Water and Sewer Authority (PWSA), Civil & Environmental Consultants, Inc. (CEC) conducted an investigation for streams, wetlands, and other waterbodies for the Panther Hollow Lake Rehabilitation Project. The Panther Hollow Lake Rehabilitation project is located in the northwestern portion of Schenley Park within the City of Pittsburgh, Allegheny County, Pennsylvania. The purpose of the investigations was to identify and delineate potentially jurisdictional features in the vicinity of the proposed project site that are subject to regulation by the U.S. Army Corps of Engineers (USACE) and the Pennsylvania Department of Environmental Protection (PADEP. Sections 2 and 3 of this report present the methodology and findings of these investigations, respectively.

2.0 METHODOLOGY

2.1 BACKGROUND DATA SOURCES

A study area was established based on the proposed project plan. The following data sources were then reviewed to aid in the identification and delineation of wetlands, streams, and other waters within the study area:

- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle mapping;
- U.S. Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) Database;
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI); and

Historical aerial imagery from various sources.

2.2 WETLAND DELINEATION METHODOLOGY

CEC ecologists reviewed the study area for potential wetlands in accordance with the routine, onsite determination methodology described in the U.S. Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987); referred to hereafter as Corps Manual, supplemented by the following technical guidance documents:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (January 2012); referred to hereafter as Regional Supplement;
- *National Wetland Plant List* (Lichvar, et al. 2016); and
- *Field Indicators of Hydric Soils in the United States* (USDA-NRCS 2017).

CEC ecologists walked the study area and collected sampling points at wetlands and representative upland locations. Data collected at each sampling point was recorded on a Wetland Determination Data Form.

At each sampling point, the following parameters were assessed: vegetation, soils, and hydrology. First, visual estimates of percent absolute cover of plant species were recorded for each of the following stratums, when present: tree, sapling/shrub, herb, and woody vine. A determination of whether the plant community was dominated by hydrophytic (wetland) plants was then made using the Rapid Test or Dominance Test indicators. Next, soils were typically sampled to a depth of at least 16 inches, and the soil profile was evaluated to determine if it exhibited hydric soil indicators. Lastly, indicators of wetland hydrology (e.g. surface water, high water table, saturation, etc.) were recorded, if present. If a parameter was determined to be significantly disturbed or naturally problematic, procedures described in the Corps Manual and Regional Supplement for atypical and problematic situations were applied.

The onsite sampling point data, in conjunction with the information compiled during the preliminary data gathering were used to determine if the sampling point was located in a wetland. If a wetland was identified, further sampling was performed to locate the wetland/non-wetland boundary. Each wetland was also classified according to the system developed by Cowardin et al. (1979). If more than one Cowardin classification type was identified within a wetland, the boundary between the types was located. Wetland boundaries located using a Trimble GeoExplorer® series GPS unit.

2.3 STREAM AND OTHER WATERS DELINEATION

CEC ecologists assessed the site for streams and other waters such as ponds, seeps, springs, and vernal pools. These aquatic resources can be identified by the presence of an ordinary high water mark in accordance with USACE Regulatory Guidance Letter No. 05-05: Ordinary High Water Mark Identification (USACE 2005).

An OHWM is defined by Federal Regulations (CFR) Part 328.3(e) as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (U.S. Congress 1986).

For streams, physical and biological data were used to infer the stream's hydrologic flow regime, using a weight-of-evidence approach. CEC used field indicators such as flow, substrate composition, presence of defined bed and bank, origin of hydrologic sources, presence/absence of vegetation within the stream channel, and presence/absence benthic macroinvertebrates, fish, and other aquatic biota to classify onsite stream segments into one of three stream types as defined by USACE (2017):

- **An ephemeral stream** has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.
- **An intermittent stream** has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.
- **A perennial stream** has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

The uppermost limit of an ephemeral stream is established where the stream loses its defined bed and bank or ordinary high water mark, and a predominance of upland vegetation was observed in the channel. When present, streams were located using a Trimble GeoExplorer® series GPS unit. The physical characteristics of the streams and field observations were summarized on field data forms.

3.0 FINDINGS

The results of the background data review and field reconnaissance are presented below. Field data forms, photographs, and other supporting data are enclosed as Appendices.

3.1 BACKGROUND DATA REVIEW

3.1.1 Topographic and NWI Maps

The Panther Hollow Lake Rehabilitation project is located in the northwestern portion of Schenley Park. This includes the region north of Boulevard of the Allies, south of Phipps Conservatory and Botanical Gardens and Schenley Drive, and below the Panther Hollow Road Bridge. Within this reach is Phipps Run, which flows southwest in a steep-sloped valley between Schenley Drive and West Circuit Road, and Panther Hollow Run, which flows west-northwest in the central valley of Schenley Park north of Panther Hollow Road. The USGS 7.5-minute topographic quadrangle map (Figure 1) does not identify any streams within this study area. The NWI data (Figure 2) identifies one permanently flooded palustrine unconsolidated bottom (PUBH) wetland that is Panther Hollow Lake. Soil map units from the SSURGO dataset (Figure 2) that occur within the study area are listen in Table 3-1.

3.1.2 USDA Soils Maps

Table 3-1 identifies the soil types found within the study area according to USDA-NRCS (2008) mapping, as depicted on Figure 2. None of the soil types found within the study area are rated as hydric, and all are rated as either high runoff (UB) or well drained (GQF).

3.2 FIELD RECONNAISSANCE

CEC ecologists conducted field investigations of the study area between May 24 and August 29, 2018. A discussion of the aquatic resources identified is provided below. Data forms and photographs for delineated features are enclosed as Appendices. Tables 3-2 and 3-3 summarize the wetlands and streams identified within the study area, respectively. Figure 3 depicts the delineated boundaries of aquatic resources, Test Sites, and photographs.

3.2.1 General Site Description

The Panther Hollow Lake Rehabilitation project is located in the northwestern portion of Schenley Park. The lake is met by steep hillslopes to the north and south, a pair of railroad tracks to the west, a small, historic footbridge at its mouth on the eastern side, and the confluence of Panther Hollow Run and Phipps Run just upstream of the bridge. A gravel foot trail loops around the perimeter of the lake, and a small concrete overflow channel occurs from the stream confluence around the north side of the lake where it ties into a stormwater pipe.

3.2.2 Wetland Delineations

Two (2) wetlands were identified within the project study area. Wetland 7 was delineated as a 0.292-acre palustrine emergent (PEM) wetland where the NWI PUBH wetland occurs. Wetland 8 had both palustrine scrub-shrub/palustrine emergent (PSS/PEM) characteristics, and separate test sites were dug to confirm these conditions. The PEM portion of Wetland 8 covered 0.27 of the 0.32-acre total. A summary of the wetlands identified and delineated within the study area are listed in Table 3-2.

3.2.3 General Site Description

Two (2) perennial streams were identified within the project study area. Panther Hollow Run (Stream 10) consists of a total length of 4,024 ft before entering the eastern side of Panther Hollow Lake. Phipps Run consists of a total length of 2,372 feet before meeting Panther Hollow Run.

TABLE 3-1
SOIL MAPPING UNITS WITHIN THE STUDY AREA

Soil Mapping Unit Name	Soil Mapping Unit Symbol	Drainage Class	Hydric Rating (Landform)
Urban land	UB	High runoff class	No
Gilpin-Upshur complex, very steep	GQF	Well drained	No

TABLE 3-2
WETLANDS WITHIN THE STUDY AREA

Waters Name	Cowardin Classification[1]	Test Sites	Photo Number	Acres	Latitude (NAD 83)	Long. (NAD 83)	Proximal Water body	Probable USACE Jurisdictional Status[2]
Wetland 7	PEM	TS-12	1, 9	0.292	40.43711	-79.9472	Panther Hollow Lake	RPW
Wetland 8	PEM	TS-13	2	0.27	40.43651	-79.94567	Panther Hollow Run (CEC Stream 10)	RPW
Wetland 8	PSS	TS-32	3	0.05	40.43711	-79.94629	Panther Hollow Run (CEC Stream 10)	RPW
Total Acres				0.612				

1 PEM – Palustrine Emergent Wetland; PSS – Palustrine Scrub Shrub Wetland; PFO – Palustrine Forested Wetland; PUB – Palustrine Unconsolidated Bottom; and POW – Palustrine Open Water.

2 Jurisdictional Status is the opinion of CEC and must be confirmed by PADEP review and/or a USACE Jurisdictional Determination. RPW – non-navigable relatively permanent waters; non-RPW – non-navigable not relatively permanent waters; and TNW – Traditionally Navigable Water. Adjacent means bordering, contiguous, or neighboring, but separated from other waters by man-made dikes or barriers, natural river berms. Abutting means in direct contact with other waters. Isolated means lacking a "discrete surface water connection" with other waters of the U.S. and lacking an interstate commerce connection.

TABLE 3-3
STREAMS WITHIN THE STUDY AREA

CEC Stream Code	Waters Name	Waters Classification	Average Top-of-Bank Channel Width	Linear Feet Within Study Area	Photo Number	Protected Use Designation[1]	Stocked or Wild Trout Stream[2]	Probable Jurisdictional Status[3]
Stream 010	Panther Hollow Run	Perennial	10	428	5, 6	WWF	No	RPW
Stream 022	Phipps Run	Perennial	8	189	7, 8	WWF	No	RPW
Total Linear Feet				617				

1 Designated Uses, Existing Uses, or Special Protections as classified by PA Code Title 25 Chapter 93: WWF – Warm Water Fishery; CWF – Cold Water Fishery; TSF – Trout Stocked Fishery; HQ – High Quality; MF – Migratory Fishery; or EV – Exceptional Value.

2 As listed as a stocked or approved trout waters or wild trout stream by the PFBC from http://www.fish.state.pa.us/waters_trout.htm. Unlisted unnamed tributaries are listed by their assessed receiving waters.

3 Jurisdictional Status is the opinion of CEC and must be confirmed by PADEP review and/or a USACE Jurisdictional Determination. RPW – non-navigable relatively permanent waters, a tributary where flow is year-round or continuous (generally 3 months or longer) at least "seasonally"; non-RPW – non-navigable not relatively permanent waters, a tributary without year-round or seasonally continuous flows (generally less than 3 months of flow); and TNW – Traditionally Navigable Water.

4.0 REGULATORY CONSIDERATIONS

A wetland and stream jurisdictional determination meeting (related to this delineation report) with regulatory agencies has not occurred at the site. Wetlands, streams and other waters that meet the guidelines contained in the Corps Manual, Regional Supplement, and Regulatory Guidance Letter No. 05-05 are subject to regulation by USACE as "waters of the U.S.", as defined by 33 CFR 328.3(a) (U.S. Congress 1986). USACE has authority to permit the discharge of dredged or fill material into waters of the U.S. under Section 404 of the federal Clean Water Act (U.S. Congress 1977). Additionally, Section 401 of the Clean Water Act requires state agencies to evaluate whether discharges to these waters comply with state water quality standards (U.S. Congress 1977). A Section 401 Water Quality Certification is required for activities that require federal permits or authorizations.

The PADEP has coinciding jurisdiction over "waters of the Commonwealth" as established by the Dam Safety and Encroachments Act (P.L. 1375, No. 325) and the Clean Streams Law (P.L. 1987, No. 3941). The PA Code of State Regulations, in Title 25, Chapter 105 Dam Safety and Waterway Management, defines "Waters of the Commonwealth," as any watercourse, stream, waterbody, or wetland, including their floodways. Similar to the USACE, PADEP generally considers channels to be potentially jurisdictional if they exhibit defined bed and banks, whether natural or artificial, with perennial or intermittent flow. The PADEP regulates encroachments, defined as "*any structure or activity which changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water,*" through the Chapter 105 permit process. The floodway is defined as extending 50 feet from the top of bank of watercourses if not delineated by a FEMA study.

In Pennsylvania, the USACE has delegated authority to the PADEP to authorize minor qualifying activities through the state-wide Section 404 permit titled PA State Programmatic General Permit 4 (PASPGP-4), with concurrent review by USACE for certain categories of impacts. A Joint Permit Application to PADEP and USACE is typically required for activities with more significant impacts that exceed the thresholds of PA Chapter 105 General Permits and PASPGP-4. In addition to encroachments, permits for discharges to waters, including from construction stormwater runoff or erosion, may be required under National Pollutant Discharge Elimination System (NPDES) and PA Chapter 102 regulations.

Title 25, Chapter 93 of the PA Code sets forth designated uses and water quality standards for surface waters that are used to determine eligibility and evaluate encroachments authorized under Chapter 105. Aquatic life use designations include Cold Water Fishes (CWF), Warm Water Fishes (WWF), Migratory Fishes (MF), and Trout Stocking (TSF). Statewide water uses including Water Supply and Recreation listed in Table 2 of PA Chapter 93.4 apply to all waterbodies unless a specific exception is indicated in PA Chapter 93.9(a)—93.9(z).

Waterbodies may also be designated special protection as High Quality (HQ) or Exceptional Value (EV) waters. HQ waterbodies are surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water by satisfying one or more of the conditions listed in PA Chapter 93.4b(a). EV waterbodies are surface waterbodies of high quality that satisfy one or more of the conditions listed in PA Chapter 93.4b(b). Also, the PA Fish and Boat Commission (PFBC) classifies streams as Approved Trout Waters that have significant portions that are open to public fishing and are stocked with trout, in accordance with Title 58, Chapter 63.20. The PFBC also lists streams as *Stream Sections that Supports Natural Reproduction of Trout* in accordance with PA Code Title 58, Chapter 57.11. Wetlands located within the floodplain of PFBC-listed wild trout streams and their tributaries thereto are provided EV protection in accordance with PA Code Chapter 105.17.

5.0 CONCLUSIONS

Two wetland areas totaling 0.612 acre were identified and delineation within the study area. A total of 6,396 linear feet of stream channel across 2 streams were identified. Wetland 7 is a PEM cattail stand on the eastern side of Panther Hollow Lake, and is fed by the confluence of Panther Hollow Run and Phipps Run. Wetland 8 is a PEM/PFO adjacent to Panther Hollow Run and Phipps Run near their confluence. Panther Hollow Lake is classified as a NWI PUBH wetland and is fed by both Panther Hollow Run and Phipps Run and by surface runoff throughout Schenley Park and the surrounding urban landscape. Panther Hollow Run and Phipps Run are both perennial streams that tend to carry high sediment loads, react strongly to large rain events, and have erosive forces that shift the stream channel and sand/gravel bars located throughout.

All the streams and wetlands identified within the study area are anticipated to be considered waters subject to jurisdiction by state and federal agencies. Additionally, the area within 50 feet of the top of the stream banks would be jurisdictional as a floodway under PADEP Chapter 105. Therefore, CEC anticipates that impacts or encroachments to these resources as a result of proposed construction activities would require PA Chapter 105 and/or CWA Section 404 permits and Section 401 WQC. Direct or indirect discharges, including construction runoff, to these resources may require National Pollutant Discharge Elimination System permits. A floodplain permit from the local municipal or county floodplain coordination may be required for activities within a mapped FEMA floodplain. Additional authorization may be required for other activities that have direct or indirect impacts to these aquatic resources. In general, CEC recommends that site design include avoidance and/or minimization of impacts to these features to the extent practicable to fulfill the project purpose and need.

6.0 LEVEL OF CARE

CEC’s wetlands and stream delineation services were conducted in a manner consistent with the criteria contained in the 1987 Corps Manual and 2012 Regional Supplement, and with the level of care and skill ordinarily exercised by members of the environmental consulting profession practicing contemporaneously under similar conditions in the locality of the project. It must be recognized that the delineation of waters was based on field observations and CEC's professional interpretation of the criteria in the 1987 Corps Manual and the Regional Supplements at the time of our fieldwork. The regulatory jurisdiction of aquatic resources identified in this report is the opinion of CEC and must be confirmed by USACE through a formal Jurisdictional Determination process or equivalent state agency review. Wetland determinations may change subsequent to CEC's delineation based on changes in the regulatory criteria, seasonal variations in hydrology, alterations to drainage patterns, or other human activities and/or natural land disturbances.

7.0 REFERENCES

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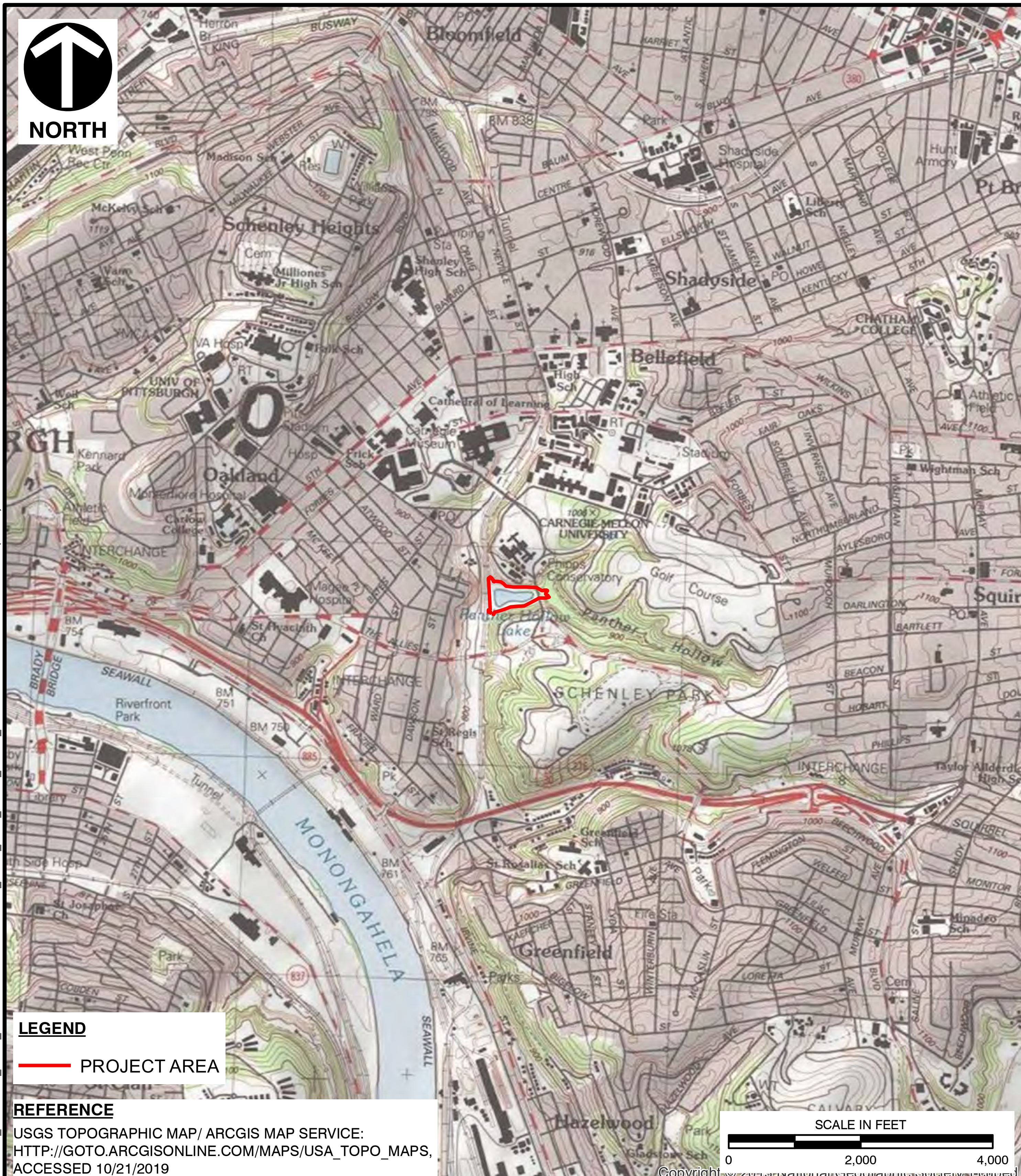

LEGEND

PROJECT AREA

REFERENCE

USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS, ACCESSED 10/21/2019

CEC
Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205-9072
412-429-2324 · 800-365-2324
www.cecinc.com

PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE
REHABILITATION PROJECT
ALLEGHENY COUNTY, PENNSYLVANIA

SITE LOCATION MAP

DRAWN BY: SML	CHECKED BY: MO	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO: 1
DATE: 10/21/2019	SCALE: 1 " = 2,000 '	PROJECT NO: 174-960	

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LEGEND

- PROJECT AREA
- SOIL MAP UNIT
- NWI WETLANDS

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PANTHER HOLLOW LAKE
REHABILITATION PROJECT
ALLEGHENY COUNTY, PENNSYLVANIA

NWI WETLANDS AND SOILS MAP

DRAWN BY: SML	CHECKED BY: MO	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO: 2
DATE: 10/21/2019	SCALE: 1 " = 200 '	PROJECT NO: 174-960	

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REFERENCE
Esri, HERE, Garmin, (c) OpenStreetMap contributors.
Accessed: 10/21/2019.

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES
GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017.

LEGEND

- TEST SITE (TS)
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- PEM WETLAND
- PSS WETLAND
- LAKE
- PROEJCT AREA

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DELINEATION MAP

DRAWN BY: SML	CHECKED BY: MO	APPROVED BY: * Hand signature on file	DRAFT	FIGURE NO:	3
DATE: 10/21/2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960			

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WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: PITTSBURGH Sampling Date: MAY 25, 2018

Applicant/Owner: PWSA State: PA Sampling Point: TS-12

Investigator(s): KHG KKF Section, Township, Range: City of Pittsburgh

Landform (hillslope, terrace, etc.): EDGE OF LAKE Local relief (concave, convex, none): NONE Slope (%): 0%

Subregion (LRR or MLRA): LRR-N Lat: 40.437117 Long: -79.947227 Datum: NAD 83

Soil Map Unit Name: WATER (W) NWI classification PUBh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area within a Wetland?	WETLAND-7
Hydric Soil Present? Yes X No		Yes X No
Wetland Hydrology Present? Yes X No		

Remarks:
WETLAND IS LOCATED IN PANTHER HOLLOW LAKE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):

Water Table Present? Yes X No ___ Depth (inches): 3"BG

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): to surface

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: TS-12

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Herb Stratum (Plot size: 5' RADIUS)			
1. TYPHA LATIFOLIA	30%	YES	OBL
2. IMPATIENS CAPENSIS	8%	NO	FACW
3. LEERSIA ORYZOIDES	10%	NO	FACW
4. BIDENS FRONDOSA	10%	NO	FACW
5. CAREX STIPATA	2%	NO	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

Purple loosestrife and yellow IRIS PRESENT IN MOST PARTS OF THE WETLAND

SOIL

Sampling Point: TS- 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100%	—	—	—	—	SILT	FULLY SATURATED w/ REDUCED ORGANIC

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:

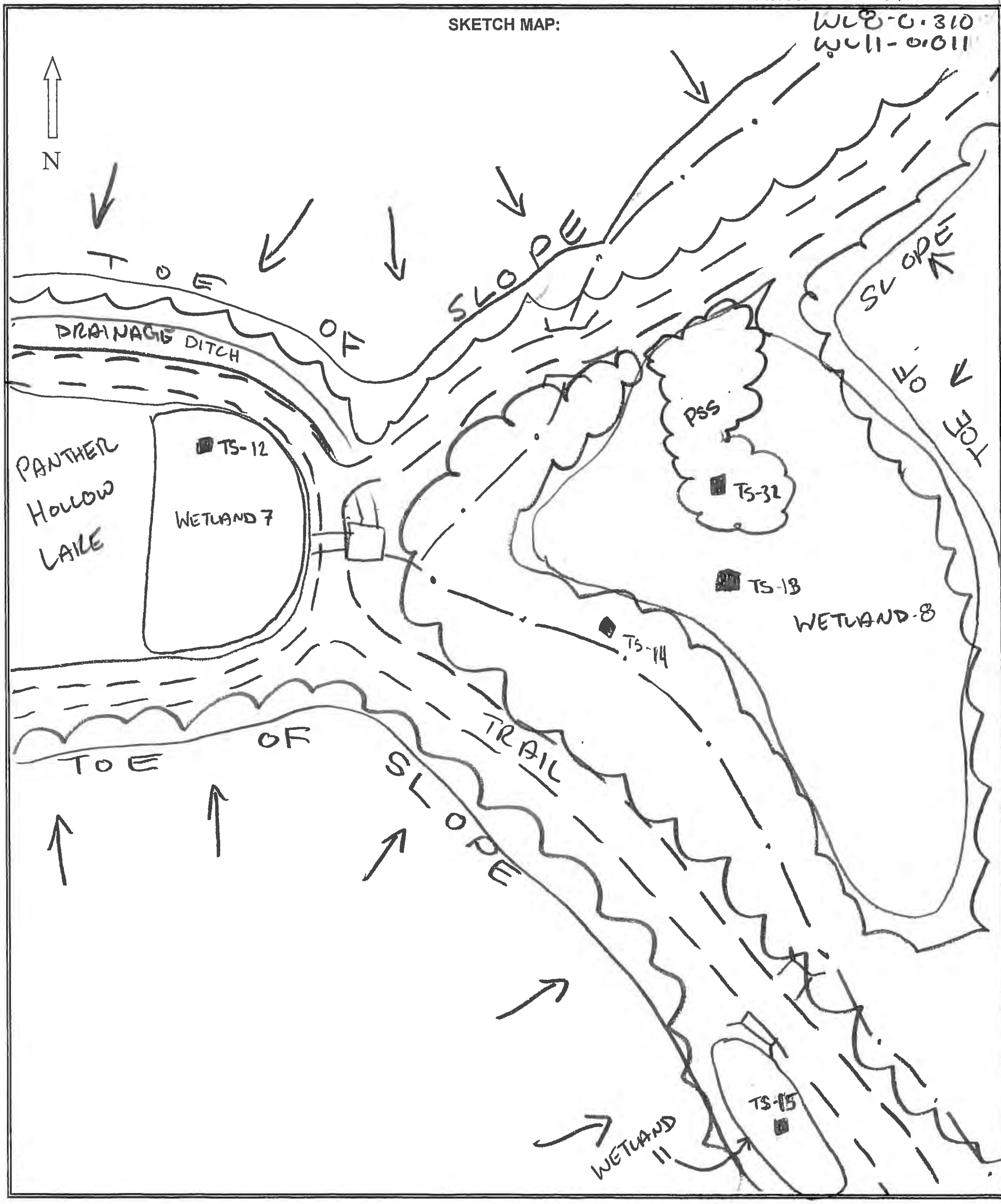
SOILS ARE FULLY SATURATED

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING

Wetland ID: WETLAND 7, 8, & 11

Date: MAY 25, 2018

Acres: WL 7 0.292
WL 8 - 0.310
WL 11 - 0.011



Notes:

1. Show approximate size and shape of wetland boundaries, adjacent drainage features (streams, ponds, etc.), photograph view, test site location, adjacent reference features (buildings, roads, etc.).
2. Show approximate dimensions of major axes of wetland (i.e., length and width)

WETLAND FUNCTION FIELD INDICATORS - DATA FORM

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING
Wetland ID: WETLAND-7

Wetland Functions:			Notes/Observations:
Wildlife Habitat		nut bearing trees and shrubs (Table 1A)	
		plants with fleshy fruit (Table 1B)	
		plants with abundant edible seeds (Table 1C)	
	X	plants with edible fleshy roots, tubers, root stocks (Table 1D)	TYPHA
		aquatic vegetation beds (Table 1E)	
		forested or shrub wetland	
		vernal pool habitat (amphibian breeding)	
		headwater salamander habitat (rocky spring/seep)	
		standing snags >10" dbh w/cavities > 2" dia	
		trees >10" dbh	
		down woody debris >6" dbh	
		vegetated hummocks/tussocks	
		forest or shrub thicket bordering >50% wetland perimeter	
		native plants comprise >90% vegetative cover	
		moderate to high interspersion of plant communities	
		moderate to high vegetation - open water interspersion	
		habitat for rare or endangered species	
		live or standing dead trees with exfoliating bark	
	X	wildlife observations: RED WINGED BLACKBIRDS	
Flood Storage	X	located within an active floodplain	
		located within 100-year floodplain	
	X	located adjacent to a pond or lake	PANTHER HOLLOW LAKE
		wetland is relatively large and/or part of a large complex	
	X	vegetation is dense and deep rooted to slow floodwater	
	X	depressional topography	
		regulated or restricted outlet (inflow>>outflow)	
Discharge		seep or spring wetland	
		wetland contributes to stream flow	
		located within stream headwaters	
		located immediately below (downstream) of a dam, impoundment	
	X	permanent hydroperiod	
Recharge	X	depressional topography	
		have an inlet but no outlet	
	X	watershed soils have a slow infiltration rate or impervious	
		wetland along a loosing stream reach	
		groundwater slopes away from wetland	
Pollution Prevention		well-developed detrial/organic mat on soil surface	
		vegetatively diverse	
		vegetation consists of persisten, deep-rooted plants (willows, *Carex*)	
		wetland is relatively large and/or part of a large complex or mosaic	
	X	seasonal to permanent hydroperiod	
		permanent pool	
	X	depressional topography	
		restricted outlet (inflow>>outflow)	
	X	located upslope of a water body (river, stream, pond, lake, etc.)	PANTHER HOLLOW ROAD
	X	located downslope of a pollution source (road, crops, livestock, etc.)	URBAN DEVELOPMENT
	X	wetland visited during growing season	
Recreation/Study Area/Social Value		located within or adjacent to a park, refuge, gameland, etc.	
		used for hunting, trapping, fishing, hiking, boating, etc.	
		fish spawning or nursery area (water willow, SAV, fringe wetland)	
		connected with a stocked or wild game fish stream	
		habitat for rare or endangered species	
		exceptional value wetland	
		adjacent to a High Quality stream	
		located in watersheds with flooding or water quality problems	
		located in/near publically funded watershed improvement project	
		record of scientific study at this area	
		included in statewide listing of historical or archaeological sites	
		regionally rare or unique wetland/ecological or geological feature(s)	
		supports at least one USFWS National Species of Special Emphasis	
		used for timber production	

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: PITTSBURGH Sampling Date: MAY 25, 2018

Applicant/Owner: PWSA State: PA Sampling Point: TS-13

Investigator(s): KHG KKF Section, Township, Range: City of Pittsburgh

Landform (hillslope, terrace, etc.): FLOOD PLAIN Local relief (concave, convex, none): NONE Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-N Lat: 40.436505 Long: -79.945665 Datum: NAD 83

Soil Map Unit Name: URBAN LAND (UB) NWI classification N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation No, Soil No, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? WETLAND-8 Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

WETLAND IS LOCATED UP STREAM OF PANTHER HOLLOW LAKE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 4"BG
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): to Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: TS-13

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' RADIUS)			
1. MALUS SP	3 %	NO	—
2. CORNUS AMOMUM	2 %	NO	FACW
3. FRAXINUS PENSYLVANICA	5 %	YES	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 % = Total Cover		
Herb Stratum (Plot size: 5' RADIUS)			
1. GLYCERIA STRIATA	30 %	YES	OBL
2. EQUISETUM ARVENSE	15 %	NO	FAC
3. IMPATIENS CAPENSIS	15 %	NO	FACW
4. LUDWIGIA ALTERNIFOLIA	10 %	NO	FACW
5. IRIS PSEUDACORUS	30 %	YES	OBL
6. RANUNCULUS HISPIDUS	20 %	YES	FAC
7. CAREX STIPATA	10 %	NO	OBL
8. EPILOBIUM SPP.	1 %	NO	—
9.			
10.			
11.			
12.			
	131 % = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

ALL TREES ROOTED OUTSIDE OF WETLAND

EPILOBIUM COULD NOT BE IDENTIFIED TO SPECIES DUE TO A LACK OF LEAVES.

MALUS COULD NOT BE IDENTIFIED TO SPECIES DUE TO HIGH LEVELS OF HYBRIDIZATION.

SOIL

Sampling Point: TS-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	92%	10YR 3/4	8%	C	PL	SiLo	VERY SATURATED

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 136, 122)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes _X_ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: Pittsburgh Sampling Date: Aug 29, 2018
Applicant/Owner: PWSA State: PA Sampling Point: TS-32
Investigator(s): KHG MJO Section, Township, Range: City of Pittsburgh
Landform (hillslope, terrace, etc.): TOE OF SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 0-1
Subregion (LRR or MLRA): LRR-N Lat: 40° 26' 13.59" N Long: 79° 56' 46.63" W Datum: NAD 83
Soil Map Unit Name: URBAN LAND (UB) NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** WETLAND-8 PSS Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:
CAM A PHOTO 1-SE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	
Water Table Present?	Yes X	No ___	Depth (inches): 11" BG	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): to surface	**Wetland Hydrology Present?** Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: TS-32

Tree Stratum (Plot size: 30' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX BABYLONICA	15%	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15% = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX NIGRA	60%	YES	OBL
2. FRANGULA ALNUS	20%	NO	FAC
3. LIGUSTRUM VULGARE	20%	NO	FACU
4. LONICERIA MORROWII	3%	NO	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	103% = Total Cover		

Herb Stratum (Plot size: 5' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. GLYCERIA Sp	40%	YES	FACW
2. IMPATIENS CAPENSIS	30%	YES	FACW
3. PELTANDRA VIRGINICA	2%	NO	OBL
4. EPILOBIUM COLORATUM	2%	NO	FACW
5. TOXICODENDRON RADIANS	1%	NO	FAC
6. RANUNCULUS Hispidus	15%	NO	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	90% = Total Cover		

Woody Vine Stratum (Plot size: 30' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. NONE			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

GLYCERIA WAS NOT IDENTIFIED TO SPECIES BUT IS ASSUMED TO BE FACW OR WETTER AS ALL SPECIES IN ALLEGHENY CO ARE FACW + WETTER.

SOIL

Sampling Point: TS-32

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
8"	—	—	—	—	—	—	—	ORGANIC
0-8	10YR 3/2	100%	—	—	—	—	SILT	Lots OF ORGANIC
8-14	10YR 2/1	100%	—	—	—	—	SDLo	EXTREMELY SATURATED
14-16	10YR 2/1	100%	—	—	—	—	CLLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:

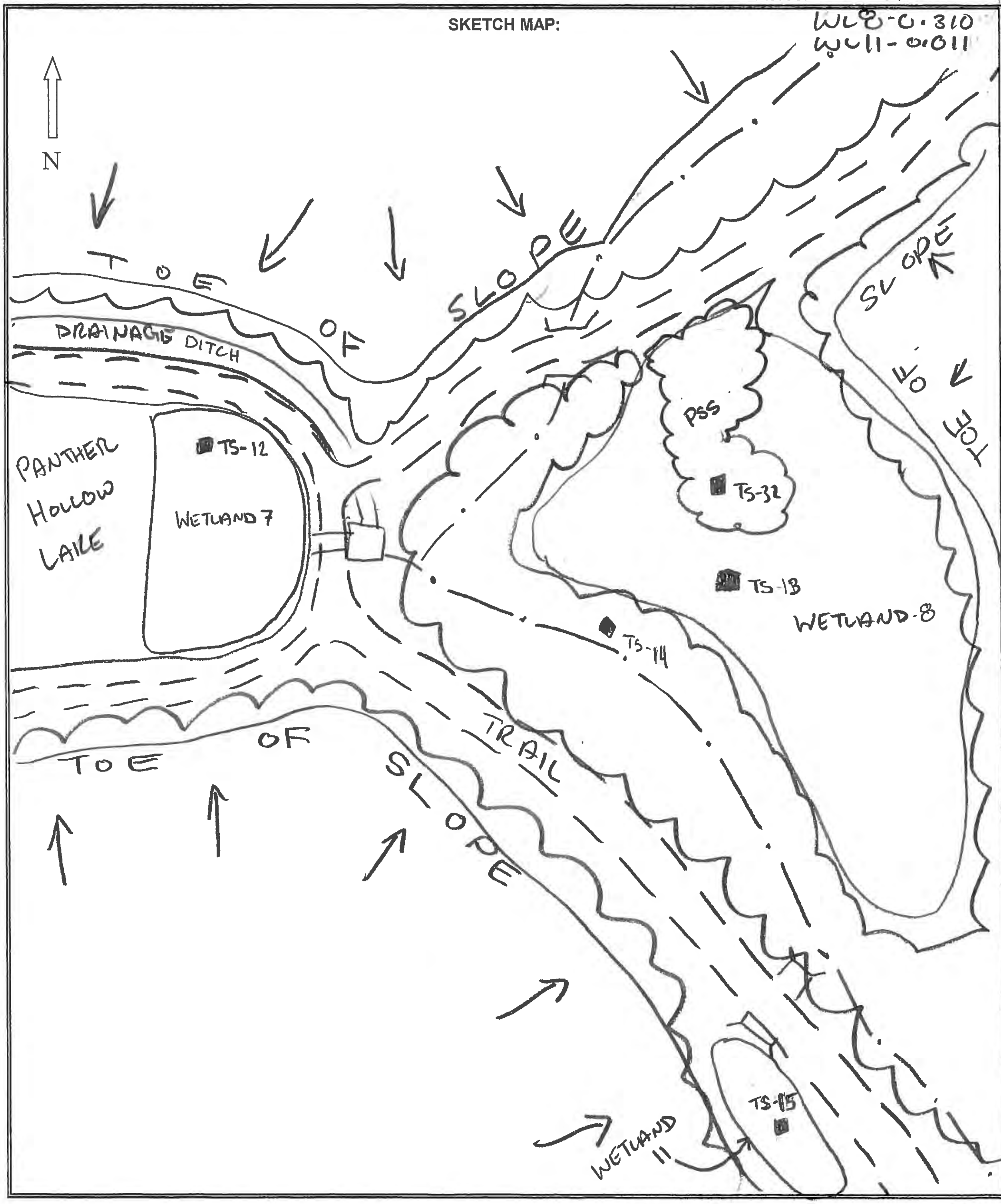
Project/Site: 174-960 Four Mile Run Daylighting

Wetland ID: Wetland 7, 8, & 11

Date: May 25, 2018

Acres: WL 7 0.292
WL 8 0.310
WL 11 0.011

SKETCH MAP:



Notes:

1. Show approximate size and shape of wetland boundaries, adjacent drainage features (streams, ponds, etc.), photograph view, test site location, adjacent reference features (buildings, roads, etc.).
2. Show approximate dimensions of major axes of wetland (i.e., length and width)

WETLAND FUNCTION FIELD INDICATORS - DATA FORM

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING

Wetland ID: WETLAND-8

Wetland Functions:			Notes/Observations:
Wildlife Habitat		nut bearing trees and shrubs (Table 1A)	
	X	plants with fleshy fruit (Table 1B)	Crab apple
	X	plants with abundant edible seeds (Table 1C)	CAREX
	X	plants with edible fleshy roots, tubers, root stocks (Table 1D)	IRIS
		aquatic vegetation beds (Table 1E)	
		forested or shrub wetland	
		vernal pool habitat (amphibian breeding)	
		headwater salamander habitat (rocky spring/seep)	
		standing snags >10" dbh w/cavities > 2" dia	
		trees >10" dbh	
		down woody debris >6" dbh	
		vegetated hummocks/tussocks	
	X	forest or shrub thicket bordering >50% wetland perimeter	
		native plants comprise >90% vegetative cover	
		moderate to high interspersion of plant communities	
		moderate to high vegetation - open water interspersion	
		habitat for rare or endangered species	
		live or standing dead trees with exfoliating bark	
		wildlife observations:	
Flood Storage	X	located within an active floodplain	
		located within 100-year floodplain	
		located adjacent to a pond or lake	
	X	wetland is relatively large and/or part of a large complex	
	X	vegetation is dense and deep rooted to slow floodwater	
		depressional topography	
	X	regulated or restricted outlet (inflow>>outflow)	
Discharge		seep or spring wetland	
		wetland contributes to stream flow	
		located within stream headwaters	
		located immediately below (downstream) of a dam, impoundment	
	X	permanent hydroperiod	
Recharge		depressional topography	
	X	have an inlet but no outlet	
		watershed soils have a slow infiltration rate or impervious	
		wetland along a loosing stream reach	
		groundwater slopes away from wetland	
Pollution Prevention		well-developed detrial/organic mat on soil surface	
		vegetatively diverse	
	X	vegetation consists of persisten, deep-rooted plants (willows, *Carex*)	
		wetland is relatively large and/or part of a large complex or mosaic	
	X	seasonal to permanent hydroperiod	
		permanent pool	
		depressional topography	
	X	restricted outlet (inflow>>outflow)	
	X	located upslope of a water body (river, stream, pond, lake, etc.)	PANTHER HOLLOW LAKE
	X	located downslope of a pollution source (road, crops, livestock, etc.)	URBAN AREA
	X	wetland visited during growing season	
Recreation/Study Area/Social Value		located within or adjacent to a park, refuge, gameland, etc.	
		used for hunting, trapping, fishing, hiking, boating, etc.	
		fish spawning or nursery area (water willow, SAV, fringe wetland)	
		connected with a stocked or wild game fish stream	
		habitat for rare or endangered species	
		exceptional value wetland	
		adjacent to a High Quality stream	
		located in watersheds with flooding or water quality problems	
		located in/near publically funded watershed improvement project	
		record of scientific study at this area	
		included in statewide listing of historical or archaeological sites	
		regionally rare or unique wetland/ecological or geological feature(s)	
		supports at least one USFWS National Species of Special Emphasis	
		used for timber production	

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: PITTSBURGH Sampling Date: MAY 25, 2018

Applicant/Owner: PWSA State: PA Sampling Point: TS-14

Investigator(s): KHG KKF Section, Township, Range: CITY OF PITTSBURGH

Landform (hillslope, terrace, etc.): VALLEY Local relief (concave, convex, none): NONE Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-N Lat: 79°56'46.51" N Long: 40° 26' 12.85" Datum: NAD 83

Soil Map Unit Name: URBAN LAND (UB) NWI classification NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes ___ No X Wetland Hydrology Present? Yes X No	UPLAND to WETLAND - 7, 8, & 11 Is the Sampled Area within a Wetland? Yes ___ No X

Remarks:
TEST SITE IS LOCATED ADJACENT TO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):

Water Table Present? Yes ___ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): To Surface

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: TS-19

Tree Stratum (Plot size: 30' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. ULMUS AMERICANA	30%	YES	FACW
2. MACLURA POMIFERA	30%	YES	UPL
3. MORUS SP	10%	NO	FACU
4.			
5.			
6.			
7.			
8.			
	70% = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. GLEDITSIA TRIACANTHOS	15%	YES	FAC
2. LIRIODENDRON TULIPIFERA	15%	YES	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30% = Total Cover		

Herb Stratum (Plot size: 5' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. EQUISETUM ARVENSE	50%	YES	FAC
2. RANUNCULUS HISPIDUS	50%	YES	FAC
3. EUTHAMIA GRAMINIFOLIA	10%	NO	FAC
4. APOCYNUM CANNABINUM	5%	NO	FACU
5. CRYPTOTAENIA CANADENSIS	1%	NO	FAC
6. LYTHRUM SALICARIA	15%	NO	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	131% = Total Cover		

Woody Vine Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

- MORUS COULD NOT BE IDENTIFIED TO SPECIES DUE TO A LACK OF FRUIT BUT IS ASSUMED to BE FACU OR UPL + IS TREATED AS FACU FOR THE DOMINANCE TEST.

SOIL

Sampling Point: TS-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100%	—	—	—	—	SiLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ______ **No** X

Remarks:

Stream Survey Data Form

CEC Stream ID:	STREAM-10	Project:	174-960.001J
Date:	MAY 24, 2018	Investigator(s):	KKF, AxC, KHG

Channel Dimensions:		
Bank-to-bank width	10	ft
Est. Normal Pool Width	6	ft
Water depth	0.15	in
Bank height	0.4	ft
OHWM height	0.3	in

Channel Morphology:			
Meandering		Eroded/unstable banks	X
Riffles		Head-cutting	
Step-pool		Channelized / stabilized	
Alluvial bars / benches		Discontinuous channel	
Braided channels		Wetland fringe	X
Entrenched/incised		Origin within survey area	X

Hydrology:	
Perennial	X
Intermittent	
Ephemeral	

Flow:	
Dry	
Bed moist	
Standing water	
Flowing water	X
Ephemeral flow	

Source:	
Spring / seepage	X
Run-off	
Lake / pond	
Outflow / outfall	
Wetland	

Substrate (check >20%):			
Bedrock		Silt / sand	X
Boulder		Clay	
Cobble	✓	Detritus	
Gravel	X	Artificial	

Road crossing or other disturbance
- ☒ Bridge MULTIPLE BRIDGES
- ☐ Ford
- ☐ Culvert (Diameter: ______)
- ☐ Other:

Stream shading: ☒ 75 - 100% ☐ 50 - 74% ☐ 25 - 49% ☐ 0 - 24%

Water quality observations: ☒ water color is clear ☐ siltation ☐ discolored, oily film, scum, AMD, algal mat, odor, etc.

Ordinary High Water Marks (OHWM) as lateral limits:

- ☐ undercut banks
- ☐ alluvial vs. colluvial soils
- ☐ exposed roots
- ☒ vegetation matted down, bent, or absent
- ☒ leaf litter disturbed or washed away
- ☐ silt deposits
- ☐ water staining
- ☐ litter and debris along banks
- ☒ destruction of terrestrial vegetation
- ☒ drift or wrack
- ☒ sediment sorting
- ☐ erosion or scour
- ☐ observed high flow event
- ☐ abrupt change in plant community

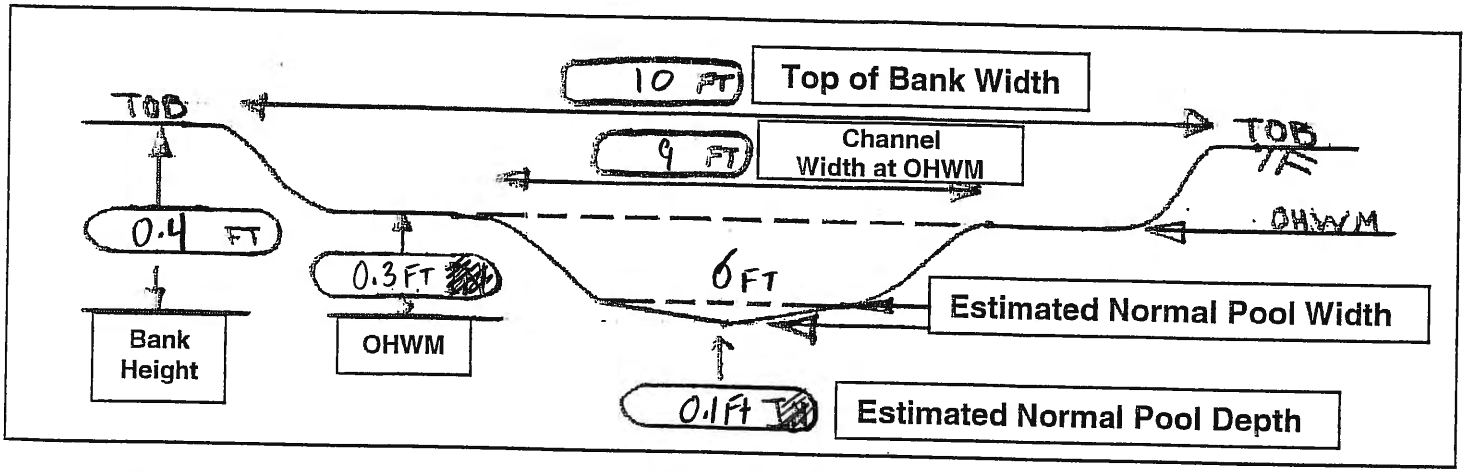
Aquatic Life: (Indicator: P - Perennial; I – Intermittent)

Organism		# or abundance	Organism		# or abundance
Fish	P		Crayfish (Decapoda)	P	
Salamander	P/I		Aquatic sowbugs (Isopoda)	I	
Freshwater mussels	P/I		Aquatic beetles (Coleoptera)	P	
Clams	P/I		Water bugs (Gerro/Nepomorpha)	P	
Mayfly (Ephemeroptera)	P		Water pennies (Psephenidae)	P	
Stonefly (Plecoptera)	P	X	Leeches (Hirudinea)	I	
Caddisfly (Tricoptera)	P	X	Segmented worms (Oligochaeta)	I	
Dragonfly/ Damselfly (Odonata)	P		Flatworms (Platyhelminthes)	I	X
Alderfly/Dobsonfly (Megaloptera)	P		Periphyton	P	
Cranefly (Tipulidae)	P		Aquatic vegetation	P	
Scud (Amphipoda)	I	X	Whirligig beetles (Gyrinidae)	I	
Black fly (Simulidae)	I		Other:		
Midge (Chironomidae)	P/I				

None observed. Circle one: absent, dry, non-wadeable, or lacking suitable habitat/substrate

CEC Stream ID:	STREAM 10	Project:	174-960.001J

Record cross-sectional measurements below:



Photographs (upstream, downstream, overview at crossing):

#	Description	Facing
	PLEASE SEE PHOTO LOG	

PA-WV format 2/2016

Notes:

UPPER PORTION OF PANTHER HOLLOW RUN

Stream Survey Data Form

CEC Stream ID:	STREAM 22	Project:	174-960.001J
Date:	MAY 25, 2018	Investigator(s):	KKF KHG

Channel Dimensions:		
Bank-to-bank width	18	ft
Est. Normal Pool Width	1.5	ft
Water depth	0.3 FT	in
Bank height	1.5	ft
OHWM height	FT	in

Channel Morphology:			
Meandering		Eroded/unstable banks	X
Riffles		Head-cutting	X
Step-pool		Channelized / stabilized	
Alluvial bars / benches		Discontinuous channel	
Braided channels		Wetland fringe	
Entrenched/incised		Origin within survey area	X

Hydrology:	
Perennial	X
Intermittent	
Ephemeral	

Flow:	
Dry	
Bed moist	
Standing water	
Flowing water	X
Ephemeral flow	

Source:	
Spring / seepage	
Run-off	
Lake / pond	
Outflow / outfall	X
Wetland	

Substrate (check >20%):			
Bedrock	X	Silt / sand	
Boulder	X	Clay	
Cobble	X	Detritus	
Gravel		Artificial	

Road crossing or other disturbance

- ☒ Bridge
- ☐ Ford
- ☐ Culvert (Diameter: ______)
- ☐ Other:

Stream shading: ☒ 75 - 100% ☐ 50 - 74% ☐ 25 - 49% ☐ 0 - 24%

Water quality observations: ☒ water color is clear ☒ siltation MILD ☐ discolored, oily film, scum, AMD, algal mat, odor, etc.

Ordinary High Water Marks (OHWM) as lateral limits:

- ☐ undercut banks
- ☐ alluvial vs. colluvial soils
- ☐ exposed roots
- ☒ vegetation matted down, bent, or absent
- ☒ leaf litter disturbed or washed away
- ☐ silt deposits
- ☐ water staining
- ☐ litter and debris along banks
- ☒ destruction of terrestrial vegetation
- ☒ drift or wrack
- ☒ sediment sorting
- ☐ erosion or scour
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- ☐ abrupt change in plant community

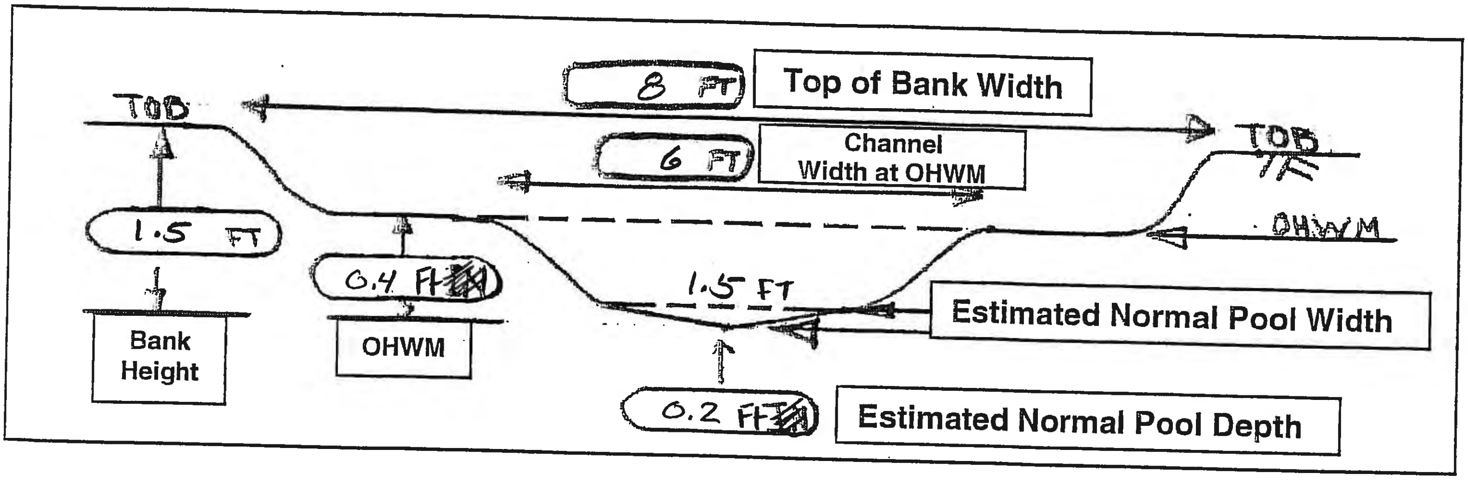
Aquatic Life: (Indicator: P - Perennial; I – Intermittent)

Organism		# or abundance	Organism		# or abundance
Fish	P		Crayfish (Decapoda)	P	
Salamander	P/I		Aquatic sowbugs (Isopoda)	I	
Freshwater mussels	P/I		Aquatic beetles (Coleoptera)	P	
Clams	P/I		Water bugs (Gerro/Nepomorpha)	P	
Mayfly (Ephemeroptera)	P		Water pennies (Psephenidae)	P	
Stonefly (Plecoptera)	P		Leeches (Hirudinea)	I	
Caddisfly (Tricoptera)	P	X	Segmented worms (Oligochaeta)	I	
Dragonfly/ Damselfly (Odonata)	P		Flatworms (Platyhelminthes)	I	
Alderfly/Dobsonfly (Megaloptera)	P		Periphyton	P	
Cranefly (Tipulidae)	P		Aquatic vegetation	P	
Scud (Amphipoda)	I		Whirligig beetles (Gyrinidae)	I	
Black fly (Simulidae)	I		Other:		
Midge (Chironomidae)	P/I				

None observed. Circle one: absent, dry, non-wadeable, or lacking suitable habitat/substrate

CEC Stream ID:	STREAM 22	Project:	174-960.001J

Record cross-sectional measurements below:



Photographs (upstream, downstream, overview at crossing):

#	Description	Facing
	PLEASE SEE PHOTO LOG	

PA-WV format 2/2016

Notes:

FLOWS INTO STREAM 10

PANTHER HOLLOW LAKE REHABILITATION PROJECT
PWSA

Photo 1: TS-12 in Wetland 7
May 25, 2018

Photo 2: TS-13 in Wetland 8 (PEM)
May 25, 2018

Photo 3: TS-32 in Wetland 8 (PSS)
August 29, 2018

Photo 4: TS-14 Upland Reference Site for Wetlands 7 & 8
May 25, 2018

Photo 5: Panther Hollow Run facing upstream
October 21, 2019

Photo 6: Panther Hollow Run facing downstream
October 21, 2019

PANTHER HOLLOW LAKE REHABILITATION PROJECT
PWSA

Photo 7: Phipps Run facing upstream
May 24, 2018

Photo 8: Phipps Run facing downstream at confluence with Panther Hollow Run
May 24, 2018

Photo 9: Wetland 7 edge at Panther Hollow Lake
May 24, 2018

APPENDIX C

DAM STABILITY AND GEOTECHNICAL REPORT (SECTION 5.7)

October 21, 2019

Mr. Alex Sciulli, P.E.
Chief of Program Management
Pittsburgh Water and Sewer Authority
1200 Penn Avenue
Pittsburgh, PA 15222

Dear Mr. Sciulli:

Subject: Dam Stability and Geotechnical Report
Panther Hollow Lake Rehabilitation Project
Pittsburgh, Allegheny County, Pennsylvania
CEC Project 174-960.001I

Civil & Environmental Consultants, Inc. (CEC) presents for your use this dam stability and geotechnical report for the above referenced project. This report presents CEC's opinions on the soil, bedrock, and groundwater conditions at the site, and our conclusions and recommendations for site development and earthwork, foundations, and subgrade stabilization.

CEC appreciates the opportunity to be of service to you on this project. Please call if you have any questions or comments.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Jonathan M. Niemiec, P.E.
Project Manager

Patrick J. Sullivan, Jr., P.E.
Principal

Enclosures

cc: Timothy J. Nuttle, PhD
Brandon C. Vatter, P.E.
Jim Turner, P.E.

PITTSBURGH
PENNSYLVANIA

PGH2O

Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

DAM STABILITY AND GEOTECHNICAL REPORT

Prepared For:

The City of Pittsburgh, Department of Public Works
Parks Maintenance Division
and
Pittsburgh Water and Sewer Authority

Prepared By:

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JONATHAN M. NIEMIEC
ENGINEER
No. PE078190

10/21/19

CEC
Civil & Environmental Consultants, Inc.

TABLE OF CONTENTS

Page

TABLES

APPENDICES

SUMMARY

This summary is presented for introductory purposes only and should be used in conjunction with the complete report. If the project design changes from what is described herein and what is shown on the attached figures, Civil & Environmental Consultants, Inc. (CEC) should review and revise, if necessary, the conclusions and recommendations presented herein.

General Information: The site is located in Schenley Park in the City of Pittsburgh, Allegheny County, Pennsylvania and covers an area of approximately 2.43 acres. The site is bounded to the north by the Phipps Conservatory; to the east by Phipps Run, Panther Hollow Run, and Hollow Run Trail; to the south by woods; and to the east by CSX railroad tracks. Proposed modifications to the existing Panther Hollow Lake requires a permit to be filed with the Pennsylvania Department of Environmental Protection (PADEP) to show that the dam meets the requirements of Pennsylvania Code Title 25, Chapter 105, Subchapter B.

Subsurface Investigation: Eight standard test borings were drilled totaling 188.2 feet of soil and bedrock sampling via hollow stem augers and SPT methods during four separate investigations between June 2018 and September 2019. One of these test borings was converted to a piezometer to measure groundwater. The test boring and piezometer locations are shown on Figure GT-01 in Appendix B. The test boring logs are presented in Appendix C.

Slope Stability: CEC analyzed the stability at the proposed critical slope location along the proposed dam embankment raise. CEC concludes that the fill embankments and cut slopes should be adequately stable if constructed in accordance with the recommendations presented herein. CEC analyzed the slopes to meet the requirements of Pennsylvania Code Title 25, Chapter 105, Subchapter B.

Subgrade Preparation: Topsoil should be stripped and stockpiled prior to fill placement and construction. Roots, brush, grass, and other deleterious materials below the topsoil should also be removed. After removing topsoil and other deleterious materials, exposed subgrades should be proof-rolled using a soil compactor weighing at least 10 tons. If the subgrade displays excessive elasticity or deformation during the proof-roll, the deflecting material should be over-excavated and replaced with suitable fill material placed and compacted in accordance with the recommendations below. Excavate to a depth where suitable material is encountered, or to a depth determined by CEC.

Excavations: Existing fill will likely be encountered in site excavations. CEC recommends that final excavated slopes be excavated no steeper than 3H:1V. Fill slopes should be planned no steeper than 3H:1V. Use temporary drainage measures, such as diversions, drains, and pumping, if water is encountered during excavations.

Over-excavations: An approximately 2-foot over-excavation is proposed beneath the core of the dam embankment. The over-excavation is necessary to reduce settlement caused by the new fill, to improve slope stability, and to reduce seepage beneath the dam embankment. The over-excavations should be replaced with suitable compacted fill in accordance with the recommendations presented herein.

Structural Cohesive Fill: CEC recommends that all new fills needed to develop the dam embankment core be constructed as controlled and well-compacted structural cohesive fill. CEC recommends using cohesive material classifying as CL based on the USCS with a maximum particle size of 6 inches.

General Fill: CEC recommends that all new fill outside the embankment core be constructed as controlled and well-compacted general fill. General fill placed at the site should not contain rock pieces larger than 6 inches in dimensional size and should classify as GW, GP, GM, GC, SW, SP, SM, SC, ML, or CL based on the USCS.

Fill Placement and Compaction: All fill should be placed in a controlled manner in maximum 8-inch thick loose lifts. Fill material containing more than 10% fines should be compacted to at least 95% of the maximum dry density. Structural cohesive fill material should be placed between optimum moisture content and 3% above optimum moisture content as estimated by the standard Proctor (ASTM 698) compaction test. General fill should be within 3% of optimum moisture content. Perform grain size analysis with hydrometer (ASTM D422), Atterberg limits (ASTM D4318), natural moisture content (ASTM D2216), and standard Proctor (ASTM D698) on all fill material to verify it's suitability as structural cohesive fill and general fill. Density and moisture content testing, in accordance with ASTM D6938, should be performed on all new fill material placed at the site. Perform density testing for every 10,000 square feet of fill placed at the site, with a minimum of one tests per lift. Density testing should also be performed every 100 linear feet along utility trenches (if applicable), with a minimum of one test per lift.

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of our geotechnical engineering services is to perform a subsurface investigation at the site to develop opinions on the soil, bedrock, and groundwater conditions, and present geotechnical conclusions and recommendations for site development and earthwork.

1.2 SCOPE OF SERVICES

In order to achieve the above-stated purpose, CEC completed the following scope of services.

(1) CEC coordinated the execution of the office and field work.

(2) CEC located the test borings in the field and obtained their coordinates from topographic drawings.

(3) CEC subcontracted Terra Testing, Inc. (Terra) and AWK Drilling (AWK-D) to perform subsurface investigations consisting of eight testing borings where one was converted into a piezometer.

(4) CEC provided a field representative to monitor the drilling, observe the materials encountered, obtain groundwater measurements, make modifications to the programs as necessary, and prepare field logs.

(5) CEC subcontracted Geotechnical Testing Services, Inc. (GTS) and to perform geotechnical laboratory testing on samples obtained during the subsurface investigations.

(6) CEC reviewed the results of the drilling and laboratory testing, and performed geotechnical analyses to develop conclusions and recommendations for site development and earthwork, dam design, and other site development considerations.

(7) CEC prepared this dam stability and geotechnical report summarizing the data obtained and presenting conclusions and recommendations in accordance with the purpose.

1.3 AUTHORIZATION

Our geotechnical engineering services were performed, and this report was prepared in general accordance with the Pittsburgh Water and Sewer Authority (PWSA) Request for Proposal for the Four Mile Run Green Stormwater Infrastructure (GSI) Project (No. PWSA89) dated January 10, 2018, our Proposal for Professional Services dated February 18, 2018, and our letter dated April 9, 2018. CEC received authorization to proceed prior to performing our scope of services outlined in Section 1.2.

1.4 STANDARD OF CARE

The services performed by CEC were conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical engineering profession practicing contemporaneously under similar conditions in the locality of the project. No warranty, express or implied, is made. Appendix A contains a document entitled "Important Information About This Geotechnical-Engineering Report." This document further explains the realities of geotechnical engineering and the limitations that exist in evaluating geotechnical issues.

1.5 REPORT LIMITATIONS

This report was prepared for the purpose of design development. Reliance on this report by any party other than PWSA or its authorized agents is expressly forbidden. Contractors should not rely on this report for purposes of bid development. The conclusions and recommendations presented herein were developed based on the site layout and grading shown on Figure GT01 in Appendix B. If the layout or grading changes, subsequent to issuance of this report, CEC will need to review the revisions and, if necessary, revise our conclusions and recommendations presented herein.

2.0 DATA OBTAINED

2.1 GENERAL INFORMATION

Panther Hollow Lake is a man-made reservoir in Schenley Park within the City of Pittsburgh and covers approximately 2.43 acres. Two tributaries, Phipps Run and Panther Hollow Run, converge immediately upstream of the lake and provide the majority of the base and storm flow from the Oakland neighborhood of Pittsburgh near Carnegie Mellon University and from the Squirrel Hill neighborhood. The lake has a concrete step edge with pedestrian paths around the perimeter. This area surrounding Panther Hollow Lake is highly utilized not only as a passage but also as social commons. The project proposes to modify the height of the embankments at Panther Hollow Lake to increase the lake's capacity to manage stormwater, create a coarse sediment forebay and fine sediment treatment wetland, and spillway system to allow more effective handling of stormwater. Based upon the proposed grading changes, a permit must be filed to the Pennsylvania Department of Environmental Protection (PADEP). As part of the permit application, the stability of the dam must be evaluated per Pennsylvania Code Title 25, Chapter 105, Subchapter B. This project is part of a larger project referred to as Four Mile Run Stormwater Infrastructure Project.

2.2 SITE TOPOGRAPHY, SOILS, MINING, AND GEOLOGY

2.2.1 Site Topography

Excavation and fill placement at the site is proposed along the existing embankments for the Panther Hollow Lake. Existing topography generally slopes towards Panther Hollow Lake from the north, east, and south. The grass area between the lake and the CSX railroad is the current location of the existing embankment and is shallow sloping. The existing normal pool elevation and maximum embankment elevation are at Elevation 806 and Elevation 810, respectively. Proposed cut and fill slopes for the site are limited to be no steeper than 3H:1V (3Horizontal:1Vertical). The proposed maximum pool will be Elevation 813 with the maximum elevation of the dam at Elevation 814.

2.2.2 Site Soils and Landslide Features

The online United States Department of Agriculture (USDA) soil survey for Allegheny County, Pennsylvania indicates that the soils consist of Urban Land; human transported material or pavement, buildings, and other artificially covered areas. According to the United States Geological Survey (USGS) Open File Maps 79-1314 (D-1) "Landslide and Related Features of the Pittsburgh East, PA Quadrangle," soil and rock susceptible to land sliding are present along the hillsides to the north and south of Panther Hollow Lake.

2.2.3 Geology, Mining, and Coal

The online Pennsylvania Geologic Map GIS database published by the USGS was reviewed to determine the site bedrock geology. This resource indicates that the bedrock at the site is Pennsylvanian-aged and belongs to the Glenshaw Formation. The Glenshaw Formations consists predominantly of shale, claystone, and red beds with less frequent sandstone, siltstone, and thin limestone and coal. The base of the Glenshaw Formation is at the top of the Upper Freeport Coal.

According to the online PADEP Mine Subsidence Insurance and Pennsylvania Mine Map Atlas resources, no surface or underground mining has taken placed at the project site. According to the Mineral Resource Report 89, "Coal Resources of Allegheny County, Pennsylvania", the Pittsburgh Coal seam is at approximate Elevation 1080, which is over 200 feet above the existing site ground surface elevations. This indicates that the Pittsburgh Coal has been eroded and is not present at the site.

2.3 SUBSURFACE INVESTIGATIONS

2.3.1 Previous Subsurface Investigation by Others

Prior to the investigations performed by CEC, two subsurface investigations were completed for the Four Mile Run Green Stormwater Infrastructure project by AWK Consulting Engineers, Inc. (AWK) and Sci-Tek Consultants, Inc. (Sci-Tek). Test Boring AWK B-10 was performed within the limits of the existing Panther Hollow Lake embankment. The test boring log for AWK B-10 in included in Appendix C.

2.3.2 CEC Subsurface Investigation

From June 11, 2018 to June 12, 2018, AWK-D completed three standard test borings (designated PZ-1, PZ-2, and PZ-3) and from November 7, 2018 to September 30, 2019, Terra completed 41 standard test borings across the Four Mile Run Stormwater Infrastructure Project site to investigate subsurface conditions. Eight of these test borings were drilled along the existing Panther Hollow Lake embankment (B-4, B-5, B-6, B-13, B-14, B-30, B-31, and PZ-1) totaling approximately 188 feet of soil and bedrock sampling. PZ-1 was a test boring that was converted to a piezometer to measure groundwater. The test borings and piezometer locations along Panther Hollow Lake are shown on Figure GT-01 in Appendix B and the logs for these borings are include in Appendix C.

Generally the test borings were advanced through the soil zone using hollow stem auger drilling methods and sampled continuously or at 3-foot centers using a split-spoon sampler and standard penetration tests (SPTs). A split-spoon sampler is a 2-inch outside diameter (OD) tube which is driven into the soil to be sampled. The sampler can be split-open lengthwise for easy removal and visual identification of the soil obtained. The SPT generally consists of driving the 2-inch OD sampling spoon using a 140-pound hammer freely falling a distance of 30 inches. The number of blows required to drive the spoon in successive 6-inch increments is recorded. The first 6-inch increment is considered a seating interval and is not used to estimate soil conditions. The sum of the number of blows required to drive the sampler through the second and third increments is considered the "N" value of the soil. The "N" value is used to estimate the relative density of coarse-grained soil or the consistency of fine-grained soil. Relative density and consistency can be used as a measure of soil strength and compressibility. Details of the SPT are described in the American Society for Testing and Materials (ASTM) Standard D1586. The test borings ranged in depth from approximately 14 to 39 feet bgs. Three of the test borings were advanced to split-spoon refusal on bedrock. CEC defines split-spoon refusal as the depth at which 50 blows or more are required to drive the sampling spoon 6 inches or less through residual soil. Hollow stem augering and split-spoon sampling of bedrock was performed in two of the test borings to observe the quality of the bedrock prior to terminating the test boring. CEC's project representative described the soil color, texture, apparent origin, and apparent moisture content of the split-spoon samples obtained during drilling.

Relatively undisturbed Shelby tube samples were obtained for laboratory testing from test borings at intervals where fine-grained existing fill soils were encountered. Details of Shelby tube sampling procedures are described in ASTM D1587.

The piezometer at PZ-1 consisted of inserting a 2-inch PVC pipe with a slotted screen portion at the bottom of the borehole and backfilled with sand around the screen. The remainder of the borehole was backfilled around the pipe to the ground surface with bentonite.

Detailed soil descriptions appear on the logs completed by CEC's field representative and can be found in Appendix C. Appendix C also contains a summary of the definitions of standard terms and symbols used on the logs and in this report. A summary of the results of the subsurface investigation is presented on Table 1.

2.4 WATER LEVEL MEASUREMENTS

During the subsurface investigations, groundwater was encountered at the completion of soil sampling only in Test Boring B-14 at approximately 13 feet bgs. Due to the high level of pedestrian activity in the area no test borings were left open after the completion of soil sampling, therefore 24-hour water level measurements were not obtained.

The groundwater elevations at PZ-1 were continuously monitored using a digital data logger. The piezometer was constructed with five feet of slotted 2-inch PVC well screen and a solid PVC riser pipe extending to the surface. A sand filter pack was installed around the well screen followed by a bentonite pellet seal to isolate the screen interval. The borehole annulus around the riser pipe was filled with bentonite chips above the sand and pellet seal. After installation, an immediate water level of 14.1 feet bgs was obtained. Extended groundwater level measurements through October 2019 have been obtained and are shown in Table 3. The water level measurements obtained from the test borings and piezometers are summarized in Table 1.

2.5 GEOTECHNICAL LABORATORY TESTING

Laboratory testing was performed on select samples obtained during drilling to determine engineering characteristics of the site soils. The laboratory testing included grain size analysis, Atterberg limits (plasticity), moisture content, consolidated undrained (CU) triaxial, and hydraulic conductivity (permeability). Unified Soil Classification System (USCS) designations were determined from the results of the grain size and Atterberg limits testing. Complete laboratory test results are presented in Appendix D and summarized in Table 2.

Table 1
Subsurface Investigation Summary

Test Boring Designation	Approximate Existing Ground Elevation (ft)	Approximate Thickness of Topsoil (ft)	Approximate Thickness of Fill (ft)	Approximate Thickness of Alluvial Soil (ft)	Approximate Thickness of Residual Soil (ft)	Total Thickness of Soil Sampled (ft)	Total Thickness of Bedrock Sampled (ft)	Total Thickness of Soil and Bedrock Sampled (ft)	Approximate Top of Bedrock Elevation (ft)	Water Level At Soil Sampling Completion (ft bgs)	Water Level At Rock Coring Completion (ft bgs)	Water Level After at Least 24 Hours[1] (ft bgs)
B-4	810.0	--	20.0	--	--	20.0	--	20.0	--	--	--	Backfilled Immediately
B-5	810.1	--	20.0	--	--	20.0	--	20.0	--	--	--	Backfilled Immediately
B-6	805.6	--	30.4	--	3.6	34.0	5.1	39.1	771.6	--	--	Backfilled Immediately
B-13	806.0	0.4	23.6	--	2.5	26.5	1.4	27.9	779.5	--	--	Backfilled Immediately
B-14	807.0	0.3	28.2	--	5.7	34.2	--	34.2	772.8	12.8	--	Backfilled Immediately
B-30	809.0	--	14.0	--	--	14.0	--	14.0	--	--	--	Backfilled Immediately
B-31	810.0	--	17.0	--	--	17.0	--	17.0	--	--	--	Backfilled Immediately
PZ-1	807.1	0.3	15.7	--	--	16.0	--	16.0	--	14.1	--	4.0
Total						**181.7**	**6.5**	**188.2**				

-- Not Encountered/Not Obtained
1. Piezometer water levels are summarized on Table 3

Table 2
Laboratory Testing Summary

Test Boring	Sample Depth (ft bgs)	Sample Origin	USCS Classifiction or (Visual Description)	USCS Group Symbol	Moisture Content (%)	% Passing No. 200 Sieve (%)	Liquid Limit(1)	Plastic Limit(1)	Plasticity Index(1)	Unit Weight (pcf)	Effective Stress		Total Stress		Hydraulic Conductivity (cm/sec)
											Angle of Friction (degrees)	Stress Cohesion (psf)	Angle of Friction (degrees)	Stress Cohesion (psf)	
B-13	6.0 - 9.0	Fill	Lean Clay	CL	34.1	95.5	40	21	19	--	--	--	--	--	--
B-13	15.0 - 19.0	Fill	Sandy Elastic Silt	MH	55.1	54.9	62	37	25	--	--	--	--	--	--
B-14	1.5 - 4.5	Fill	Sandy Fat Clay	CH	27.6	66.9	50	27	23	--	--	--	--	--	--
B-14	10.0 - 12.0	Fill	Sandy Lean Clay	CL	45.0	58.1	46	23	23	--	--	--	--	--	--
B-30	6.0 - 8.0	Fill	Gravelly Lean Clay with Sand	CL	26.7	53.8	45	26	19	122.1	--	--	--	--	1.8E-06
B-31	3.0 - 5.0	Fill	Sandy Elastic Silt with Gravel	MH	39.1	52.9	56	31	25	97.0	33.7	144	13.1	691.2	--
B-31	8.0 - 10.0	Fill	Silty Sand	SM	44.0	29.7	--	--	--	96.6	41.4	43.2	7.3	633.6	--
B-31	15.0 - 17.0	Fill	Silty Sand	SM	37.9	37.1	--	--	--	87.2	--	--	--	--	2.4E-05

Notes:

-- Test was not performed / Not Applicable

(1) Atterberg Limits performed on portion of sample passing #40 sieve.

Table 3
Piezometer Construction and Water Table Elevation Information[1]

Test Boring Designation	Ground Elevation (ft)	Well Bottom Elevation (ft)	Screen Length (ft)	High Water Table Elevation[2] (ft)	Low Water Table Elevation[3] (ft)	Water Table Fluctuation (ft)
PZ-1	807.1	792.1	5.0	805.8	801.09	4.7

1. Pizometer well information from July 2018 to October 2019
2. Water level measured on 2/13/19
3. Water level measured on 10/4/19

3.0 CONCLUSIONS

CEC presents the following conclusions based on the data obtained, our observations, analyses performed, and our experience with similar materials. The test borings performed at this site represent the subsurface conditions at locations and times of the investigations. Subsurface conditions at other locations at the site may differ.

3.1 TOPSOIL CONDITIONS

Topsoil is defined as surficial soil that supports vegetative growth containing organic material concentrations visually exceeding about 10%. Topsoil up to approximately 5 inches thick was encountered in the test borings. Topsoil thickness and conditions may vary in other areas and may be interpreted differently by others. Topsoil is generally compressible and contains organic materials that decompose over time. The topsoil is not suitable to support new fills or structures, or for reuse as new fill. The topsoil may be suitable for reuse in landscaping or revegetation applications. Testing the topsoil for fertility or landscaping suitability was not included in the scope of this investigation.

3.2 EXISTING FILL CONDITIONS

The existing fill at the site was placed to construct the embankment for Panther Hollow Lake. Fill materials were encountered at the ground surface or directly beneath topsoil and ranged in thickness from approximately 14 to 30 feet and consisted of coarse and fine-grained material. Varying amount of deleterious materials (organics, roots, plastic, etc.) were noted throughout the existing fill. The consistency of the fine-grained existing fill was variable, ranging from very soft to very stiff but was primarily very soft to medium stiff. The coarse-grained existing fill that was encountered had relative densities ranging from very loose to medium dense but was primarily very loose to loose.

Laboratory testing was performed on eight samples of existing fill at depths ranging from 2 to 19 feet. According to the USCS the existing fill classified as CL (sandy lean clay and lean clay), CH (sandy fat clay), MH (sandy elastic silt and sandy elastic silt with gravel), and SM (silty sand). The liquid limits ranged from 40 to 62 with an average of approximately 50. The plastic limits ranged from 21 to 37 with an average of approximately 28. The fines content ranged from approximately 30% to 96% with an average of approximately 56%. The in-situ moisture content ranged from approximately 27% to 55% with an average of approximately 39%.

Hydraulic conductivity tests were performed on two undisturbed existing fill samples. The undisturbed permeabilities ranged from 2.4 x10^{-5} to 1.8x10^{-6} cm/sec with an average of 1.3 x 10^{-5} cm/sec. Two undisturbed CU triaxial tests were performed on existing fill samples from Test Boring B-31. CEC determined that the results from B-31 (8 – 10 feet bgs) were not representative of the observed conditions due to material inconsistencies and two different soil characteristics within the Shelby tube sample. Therefore, the CU triaxial results from B-3 were not used in our analyses. The CU triaxial test results from B-31 (3 – 5 feet bgs) appeared to be representative and resulted in an effective angle of friction and cohesion of approximately 34 degrees and 144 psf, respectively. The total strength angle of friction and cohesion reported from the B-30 CU test were 13 degrees and 691 psf, respectively.

Existing fill will be encountered during site grading excavations, and the proposed stormwater structures and utility excavations. Soft/loose soils are generally not suitable to support new fill or structural features such as box culverts or risers. If soft/loose soils are encountered at over-excavation subgrades or foundation subgrades, improvement of these materials by densification (if possible) or removal and replacement will be required.

Based on laboratory testing results, the moisture content of each existing fill sample was above the sample's plastic limit. A moisture content exceeding a material's plastic limit will render the material unsuitable for fill placement without moisture conditioning and lead to rutting, deflecting, and pumping during compaction efforts. Moisture conditioning such as drying, mixing with dryer material, or use of amendments such as hydrated lime may be required to achieve compaction when using the on-site existing fill for new fill.

3.3 RESIDUAL SOIL CONDITIONS

Residual soil (residuum) is defined as material that results from the physical and chemical weathering of bedrock. Residual soils may retain relic structures of the parent bedrock, such as bedding planes, but they are soft enough to be penetrated with a split-spoon sampler. When encountered, residual soil was beneath the existing fill and ranged from 3 to 6 feet in thickness. The residual soil sampled from the test borings consisted of decomposed claystone.

Residual soils are not expected to be encountered during excavations across the site. CEC concludes that residual soils if encountered at the site are generally suitable to for reuse as fill and to support new fill and structural features.

3.4 BEDROCK CONDITIONS

The top of bedrock is defined by CEC as the depth at which 50 blows or more are required to drive the sampling spoon 6 inches or less through residual soil. Bedrock was encountered in three of the test borings at depths that ranged from approximately 27 to 34 feet bgs. Bedrock core was not obtained as part of this investigation, however bedrock was sampled through hollow stem augering and split-spoon sampling. The bedrock encountered in the test borings consisted of claystone. Bedrock will be not be encountered during construction.

3.5 GROUNDWATER CONDITIONS

Water was present at the completion of soil sampling in Test Boring B-14 at a depth of approximately 13 feet bgs. Each test boring was backfilled after the completion of soil sampling therefore no extended water level measurements were recorded. Piezometer PZ-1 yielded a water level measurement of approximately 14 feet bgs after the completion of the installation. Extended water level measurements at PZ-1 were obtained from July 18th, 2018 through October 10th, 2019. The maximum recorded water level measurement was obtained on February 13, 2019 at approximately Elevation 806 and the minimum recorded water level measurement was obtained on October 4, 2019 at approximately Elevation 801. The average water level was approximately Elevation 803.

Based on the results of these measurements and the results of the analysis, CEC concludes that groundwater will likely be encountered during site excavations to install the proposed spillway pipes and during excavations within the existing pond. If water is encountered, it can generally be controlled using standard drainage techniques, such as diversion ditches and pumping.

3.6 SLOPE STABILITY

CEC analyzed the stability of the proposed slopes at the critical location (Cross Section A-A) shown on Figure GT-01 in Appendix B. The stability of the proposed and existing slopes was analyzed using Rocscience's Slide Version 8.0 software (Slide) and the minimum factor of safety (FS) was calculated using Spencer's method. A FS is commonly used to quantify the stability of a slope and is defined as the ratio of a slope's resisting forces to driving forces. The scenarios analyzed and minimum target factors of safety used are presented in the calculation in Appendix E and are based on the requirements in Pennsylvania Code Title 25, Chapter 105, Subchapter B. All scenarios evaluated at Cross Section A-A met or exceeded the minimum FS presented in the attached calculation. CEC concludes that the fill embankments and cut slopes should be adequately stable if constructed in accordance with the recommendations presented herein.

4.0 RECOMMENDATIONS

CEC presents the following recommendations for site development and earthwork. It may be necessary for CEC to perform additional analyses and develop revised recommendations if the final layout and grading are altered after this report is issued.

4.1 SITE DEVELOPMENT AND EARTHWORK

4.1.1 Subgrade Preparation

Topsoil should be stripped and stockpiled prior to fill placement and construction. Roots, brush, grass, and other deleterious materials below the topsoil should also be removed. After removing topsoil and other deleterious materials, exposed subgrades should be proof-rolled using a soil compactor weighing at least 10 tons. If the subgrade displays excessive elasticity or deformation during the proof-roll as determined by CEC, the deflecting material should be over-excavated and replaced with suitable fill material placed and compacted in accordance with the recommendations in Section 4.1.3. Excavate to a depth where suitable material is encountered, or to a depth determined by CEC.

4.1.2 Excavations

Existing Fill Over-excavation: CEC recommends an over-excavation of two feet of existing fill be performed directly underneath the proposed embankment core prior to fill placement. The over-excavation is necessary to reduce settlement caused by the new fill, to improve slope stability, and to reduce seepage beneath the dam embankment. The over-excavations should be replaced with suitable compacted fill in accordance with the recommendations presented in Section 4.1.3.

Cut Slopes: Grading for the dam will necessitate excavating cut slopes through existing fill. Permanent cut slopes should be graded as shown on Figure GT-01 – no steeper than 3H:1V. CEC anticipates that groundwater may be encountered during the existing fill excavation within the limits of Panther Hollow Lake. Use temporary drainage measures, such as diversions, drains, and pumping, if water is encountered during excavation. If cut slopes or portions of the cut slopes appear to be unstable, CEC recommends flattening or over-excavating and reconstructing the cut slopes.

4.1.3 New Fill

General: It is anticipated that excess fill generated from proposed site excavations will be utilized as fill at other locations around the perimeter of the lake. Soils excavated from the lake may be used as fill, provided they are suitable and meet the recommendations presented herein. Soils excavated from the lake that are not needed for fill placement or do not meet the requirement for new fill will be transported offsite and utilized as fill at ancillary project locations or disposed at an approved permitted facility.

General Fill: CEC recommends that all new fill outside the embankment core be constructed as controlled and well-compacted structural cohesive fill. Three of the eight existing fill samples that were tested classified as fat clay (USCS classification CH) or elastic silt (USCS classification MH). These soil types were encountered at various depth within the fill. These materials should not be used on site unless blended with suitable fill materials, lime, or other stabilizing agents. Additionally, deleterious materials (organics, roots, plastics, etc.) should be removed from the existing fill if used as general fill. General fill placed at the site and beyond or adjacent to the embankment core should not contain rock pieces larger than 6 inches in maximum dimension and should classify as GW, GP, GM, GC, SW, SP, SM, SC, ML, or CL based on the USCS.

Structural Cohesive Fill: CEC recommends that all new fills needed to develop the dam embankment core be constructed as controlled and well-compacted structural cohesive fill. CEC recommends using cohesive material classifying as CL based on the USCS with a maximum particle size of 6 inches. Structural cohesive fill should be placed between optimum moisture content and 3% above optimum moisture content as estimated by the standard Proctor (ASTM 698) compaction test to decrease its permeability. Do not use lime or cement to dry structural cohesive fill.

Fill Placement and Compaction: All fill should be placed in a controlled manner in maximum 10-inch thick loose lifts. Each lift should be compacted with at least 5 passes using a soil compactor weighing at least 10-tons. Fill material containing more than 10% fines should be compacted to at least 95% of the maximum dry density as determined by the standard Proctor Compaction test (ASTM D698). General fill should be within 3% of optimum moisture content and structural cohesive fill should be at or within 3% above optimum moisture content. Adjustments to the soil moisture by wetting or drying should be made as needed. Padded-drum compactors should be used to compact fine-grained fill material (silts and clays). Clean coarse-grained cohesionless soil containing less than 10% fines should be compacted to non-movement with at least 5 passes using a 10-ton or heavier smooth-drum vibratory soil compactor. At the end of each work day, new fill should be compacted with a smooth-drum roller to reduce the impact of precipitation.

Perform grain size analysis (ASTM D422), Atterberg limits (ASTM D4318), natural moisture content (ASTM D2216), and standard Proctor (ASTM D698) testing on new fill material to verify its suitability prior to construction. Density and moisture content testing, in accordance with ASTM D6938, should be performed on all new fill material placed at the site. Perform density testing for every 10,000 square feet of fill placed at the site, with a minimum of one test per lift. Density testing should also be performed every 100 linear feet along utility trenches (if applicable), with a minimum of one test per lift.

Bonding Bench (Detail 1, Figure GT-01): Bonding benches should be used where fill is being placed on existing slopes steeper than 10H:1V. Bonding benches should be made using a dozer during fill placement to bond, or notch, new fills into existing soils.

Weather Considerations: Fine-grained clayey soils are present at the site. These materials will be reused as new fill. Soils with moisture content at or below optimum moisture or greater than 3% above their optimum moisture content cannot be properly placed as new fill. If earthwork is performed during winter or spring months, or during inclement weather, fill placement will be difficult and the contractor should expect a reduction in productivity or lost work days. Earthwork operations of this scope can be significantly affected by inclement weather and/or precipitation. CEC recommends only performing earthwork during summer or early fall to reduce the impact of inclement weather.

4.2 CONSTRUCTION PHASE SERVICES

Geotechnical engineering is a two-phase process. Phase 1 includes a subsurface investigation, analysis, and preparation of a report presenting conclusions and recommendations. Phase 2 involves observing that field construction conditions do not differ from the anticipated conditions, assessing the appropriateness of the recommendations, and confirming that our recommendations are being properly implemented. As documented in this report, significant geotechnical issues are being addressed in the development of the site. Therefore, it is important to have CEC observe the actual conditions encountered during construction to determine if they conform to our conclusions and recommendations. The recommendations presented in this report are contingent on CEC observing:

- Over-excavations;
- Proof-rolling and subgrade conditions;
- Fill placement and compaction;
- Slope construction; and
- General Compliance with the geotechnical recommendations.

APPENDIX A

IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can

construction project.

Geotechnical-Engineering Services Are Performed for

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture

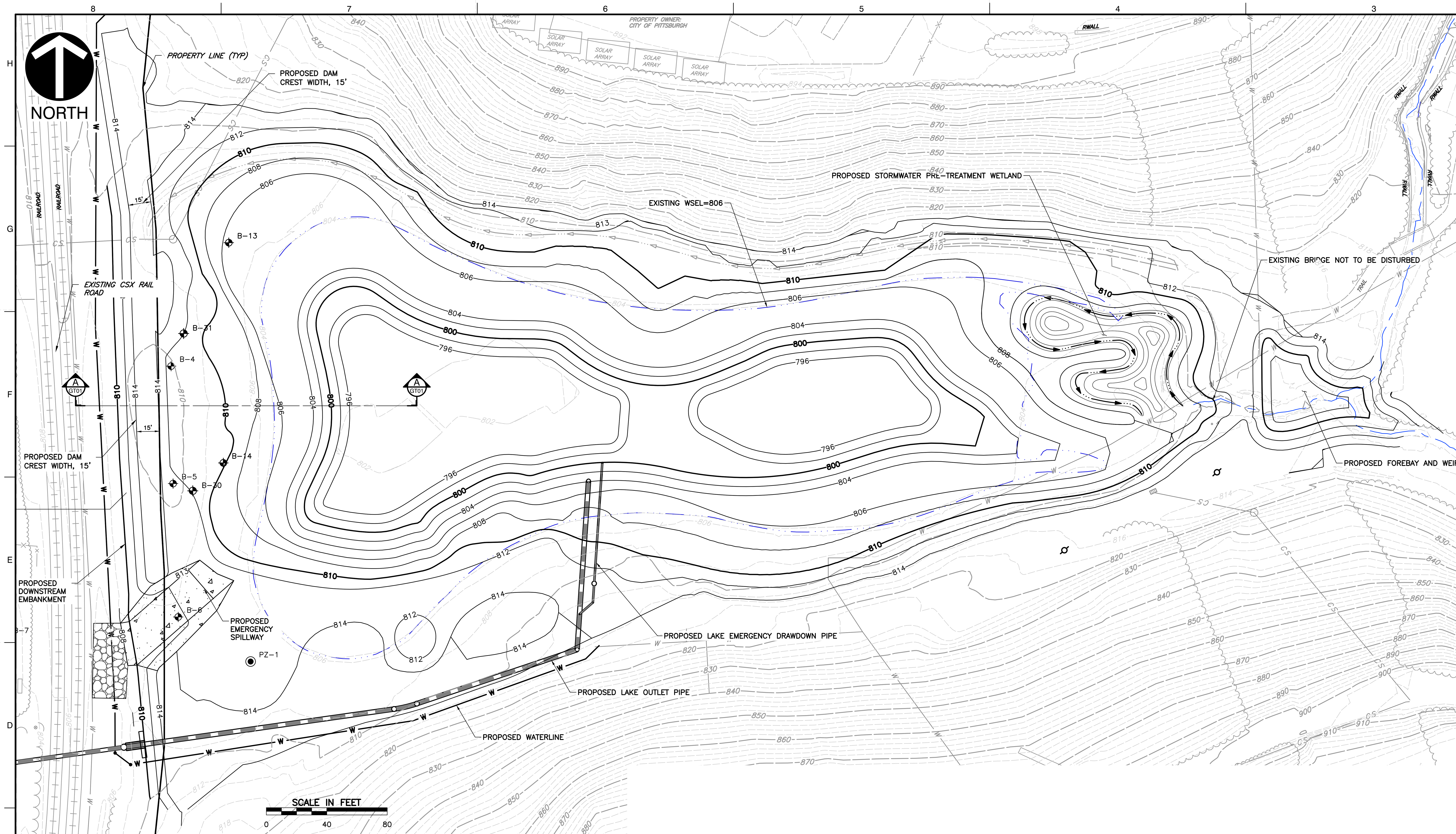
While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org   www.geoprofessional.org

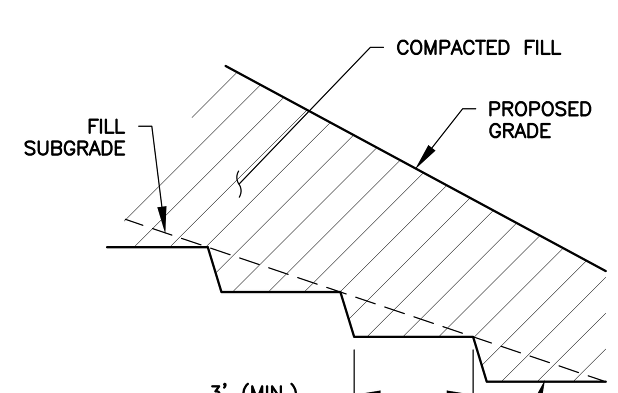
APPENDIX B

FIGURES



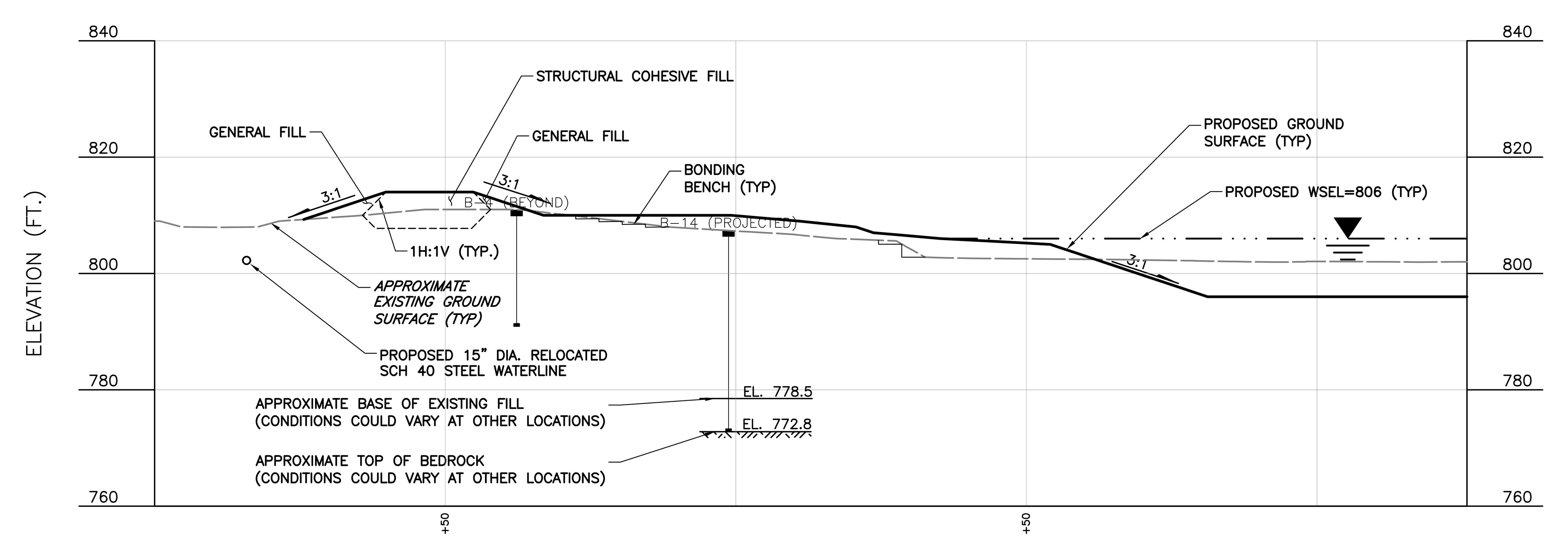
LEGEND

— —	EXISTING PROPERTY LINE
820	EXISTING INDEX CONTOUR
	EXISTING INTERMEDIATE CONTOUR
	EXISTING TREE
CS	EXISTING COMBINED SEWER LINE
ST	EXISTING STORM SEWER LINE
W	EXISTING WATER LINE
G	EXISTING GAS LINE
OH-E	EXISTING OVERHEAD ELECTRIC WIRES
UG-E	EXISTING UNDERGROUND ELECTRIC DUCT
780	PROPOSED INDEX CONTOUR
	PROPOSED INTERMEDIATE CONTOUR
W	PROPOSED WATERLINE
B-7	APPROXIMATE CEC TEST BORING LOCATION
AWK B-1	PREVIOUSLY CONDUCTED TEST BORING LOCATION (BY OTHERS)
PZ-#	PIEZOMETER INSTALLATION LOCATION

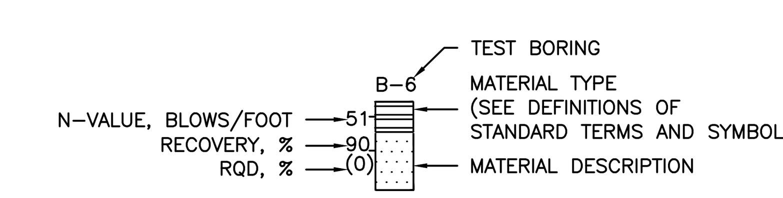


EXCAVATE A DOZER NOTCH INTO SOIL AS FILL PLACEMENT PROGRESSES TO PROVIDE A KEY BETWEEN THE FILL SUBGRADE AND NEW FILL MATERIALS. USE FOR ALL FILL PLACED AT THE SITE.

DETAIL 1
BONDING BENCH
NOT TO SCALE



CROSS SECTION A-A
SCALE H:1"=20'; V:1"=20'



REFERENCE

1. EXISTING CONTOURS DERIVED FROM A BARE-EARTH DIGITAL ELEVATION MODEL CONSTRUCTED FROM PAMAP LIDAR (LIGHT DETECTION AND RANGING) ELEVATION POINTS. TOPOGRAPHIC CONTOURS MAPPED AT AN INTERVAL OF 2 FEET; DEVELOPED BY PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY; DATED 2006.

GEOLOGIC CONDITIONS

1. THE TEST BORING INFORMATION PRESENTED HEREIN DEPICTS SUBSURFACE CONDITIONS AT THE TEST BORING LOCATIONS AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER.
2. GEOLOGIC CORRELATIONS BETWEEN TEST BORINGS ARE GENERALLY BASED ON STRAIGHT-LINE INTERPOLATION. ACTUAL CONDITIONS BETWEEN TEST BORINGS MAY DIFFER.

REVISION RECORD

NO	DATE	DESCRIPTION

CEC
Civil & Environmental Consultants, Inc.
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Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

PGH2O Pittsburgh Water & Sewer Authority

PITTSBURGH WATER & SEWER AUTHORITY
FOUR MILE RUN
STORMWATER IMPROVEMENT PROJECT
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JIO	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

GEOTECHNICAL BORING LOCATION PLAN
PANTHER HOLLOW LAKE DAM RESTORATION
AND FOREBAY POND

FIGURE NO.: **GT01**

P:\2017\174-960\-CADD\Dwg\GT01\174960-CV01-GT-01.dwg{GT01} LS:(10/21/2019 - cross) - LP: 10/21/2019 3:18 PM

APPENDIX C

TEST BORING LOGS

Rock Types

Rock Name	Characteristics	Symbol
Shale	Clay sized particles, shale has fissility which is a horizontal sheet-like or laminated feature.	
Claystone	Clay sized particles that are consolidated, lacking fissility.	
Siltstone	Composed of silt, normally breaks as irregular chunks	
Sandstone	Primarily sand sized particles modified w/ the descriptor fine, medium, or coarse.	
Conglomerate	Gravel sized grains and larger held together by finer material, called a breccia if clasts are angular.	
Limestone	Effervesses w/ diluted HCl, can be composed of clay up to gravel particles (fossils).	
Coal	Black and shiny, can break into cubes or conchoidally.	

Rock Quality Descriptions

Weathering

Completely Weathered: All rock material is decomposed and/or disintegrated. The original rock structure may still be intact.

Highly Weathered: More than half of the rock material is decomposed. Fresh rock is present only as a discontinuous framework or as corestones.

Moderately Weathered: Less than half of the rock material is decomposed. Fresh rock is present at a discontinuous framework or as corestones.

Slightly Weathered: Discoloration or staining indicates weathering of rock material on discontinuity surfaces. Rock may be discolored and softened.

Fresh: No visible signs of rock material weathering.

RQD

Descriptor	%
Very Poor	<25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	>90

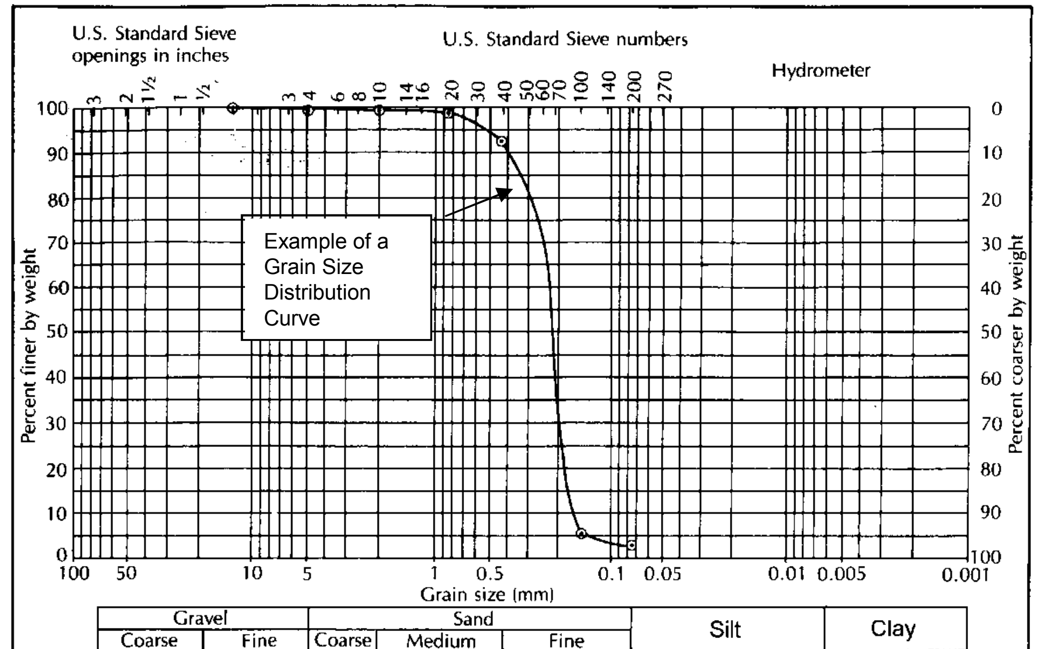
Brokenness

Descriptor	Fracture Spacing (in & ft)
Very Broken	< 1 (<0.08)
Broken	1-3 (0.08-0.25)
Moderately Broken	3-6 (0.25-0.5)
Slightly Broken	>6 (>0.5)

Rock Hardness

Descriptor	Field Criterion	Relative Unconfined Compressive Strength
Very Hard	Difficult to break w/ Hammer	> 30,000 psi
Hard	Hand-held sample breaks w/ Hammer	15,000 to 30,000 psi
Medium Hard	Cannot scrape surface w/ knife	7,500 to 15,000 psi
Soft	Cutting or scraping w/ knife difficult	3,500 to 7,500 psi
Very Soft	Can be cut w/ knife	< 3,500 psi

Grain Size Distribution Curve



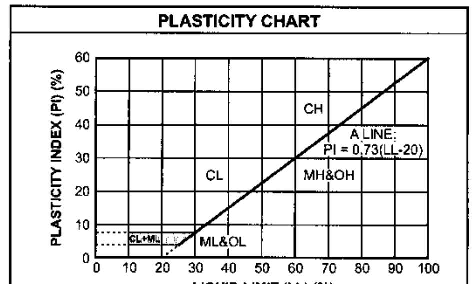
UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA		
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent .... GW, GP, SW, SP
More than 12 percent .... GM, GC, SM, SC
5 to 12 percent .... Borderline cases requiring dual symbols

PLASTICITY CHART



Glossary

Alluvial Soil: soil that has been deposited by moving water or developed on a floodplain or delta.

Bedrock: general term describing solid rock underlying the soil or any other unconsolidated surficial cover that is in place and continuous.

Colluvial Soil: incoherent soil and rock at the foot of a slope or cliff, deposited there principally by gravity.

Fill: material that has been placed by man in a controlled or uncontrolled manner; fill can include soil, rock, rubble, construction debris, etc.

Glacial Outwash: sand and gravel transported away from a glacier by streams of meltwater and deposited in a preexisting valley or over a plain in a sorted manner.

Glacial Till: a heterogeneous mixture of clay, sand, gravel, and boulders which is deposited by and underneath a glacier and is unsorted and unstratified.

"N" Value: is considered to be an indication of the relative density of coarse-grained soils (sand and gravel) or consistency of fine-grained soils (silt and clay).

Percent Recovery: total length of rock core retrieved in the core barrel divided by the total length of the core run.

Residual Soil: natural soil materials that retain relic structures of the underlying parent bedrock, such as bedding planes, but are soft enough to be penetrated by a split-spoon sampler.

Refusal: the depth at which 50 SPT hammer blows or more are required to drive the sampling spoon 6 inches or less.

Rock Quality Designation (RQD): the sum of the lengths of intact rock core pieces longer than 4 inches (excluding mechanical breaks) divided by the total length of the core run, expressed as a percentage.

Shelby Tube: a 2 to 3" thin walled sampling tube that is pushed into the soil to obtain a relatively undisturbed soil sample for geotechnical laboratory tests.

Split Spoon Sampler: a sampling tube which can be split-open lengthwise for easy removal and visual inspection of the soil obtained.

Standard Penetration Test (SPT) ASTM D1586 : in general the SPT consists of driving a 2-inch outside diameter split-spoon sampler 18 inches using a 140-pound hammer free falling a distance of 30 inches. The number of blows that is required to advance the spoon through successive 6-inch increments is recorded. The first increment is considered a seating of the sampler. The sum of the blows for the second and third increments is the "N" value.

Unconsolidated Material

Term	Grain Size (mm)	Example Size
Clay	<1/250	can't see grains
Silt	1/250 - 1/16	grains seen w/ naked eye
Fine Sand	1/16 - 1/4	table salt to sugar
Med. Sand	1/4 - 2.0	openings in a window screen
Course Sand	2.0 - 4.75	sidewalk salt
Gravel	4.75 - 75	pea to tennis ball
Cobble	75 - 300	orange to tennis ball
Boulder	>300	larger than a basketball

Modifiers for Soils with Two Grain Sizes

Term	%	Term	%
Trace	< 12	Some	12-30
Adjective (i.e. silty)	30-45	And	45-55

Moisture Content

Dry: Sample is dusty or very obviously very dry.
Moist: Anything that does not fit the definition of dry or wet.
Wet: Sample contains free water.

N-Value Rating

Fine-Grained Soils

Consistency	Blows/ft
Very Soft	0-2
Soft	3-4
Medium Stiff	5-8
Stiff	9-15
Very Stiff	16-30
Hard	>30

Coarse-Grained Soils

Relative Density	Blows/ft
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

Civil & Environmental Consultants, Inc.

Definition of Standard Terms and Symbols

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-4

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 11/9/19 **COMPLETED** 11/9/18
GROUND ELEVATION 810 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger & SPT
AT END OF SOIL SAMPLING --- N/A
CEC REP LDC **CHECKED BY** CEH
AT END OF CORING --- N/A
NOTES
24hrs AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
810		Dark brown CLAY, some rock fragments, trace organics, moist, soft to medium stiff, **(FILL)**	0	SS 1	60	2-2-3 (5)	0.25	
				SS 2	100	4-5-3 (8)	0.25	
805			5	SS 3	67	3-2-2 (4)	0.25	
800			10	SS 4	53	3-2-2 (4)	0	
		Dark gray to black sandy SILT, some rock fragments, trace organics, moist, very soft to soft, **(FILL)** *Brown clay lense observed between approximately 12.0 -12.4 feet bgs*		SS 5	100	1-1-1 (2)	0	
795			15	SS 6	100	1-1-1 (2)	0	
790			20	SS 7	100	1-2-2-2 (4)	0.2	
		Bottom of boring at 20.0 feet.						

BORING NUMBER B-5

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 11/9/18 **COMPLETED** 11/9/18
GROUND ELEVATION 810.1 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger & SPT
AT END OF SOIL SAMPLING --- N/A
CEC REP LDC **CHECKED BY** CEH
AT END OF CORING --- N/A
NOTES
24hrs AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
810	Dark brown silty CLAY, trace rock fragments, trace organics, moist, medium stiff, **(FILL)**	0	SS 1	67	2-2-3 (5)	1
	Reddish brown CLAY, dry, medium stiff, **(FILL)**		SS 2	80	4-4-4 (8)	.5
805	Dark brown to brown silty CLAY, trace rock fragments, moist, very soft to stiff, **(FILL)**	5	SS 3	133	4-4-7 (11)	.75
800	Dark gray to black sandy SILT, trace rock fragments, slag, and coal, trace organics, moist, very soft to medium stiff, **(FILL)**	10	SS 4	100	2-1-1 (2)	.25
			SS 5	100	3-2-3 (5)	0
795		15	SS 6	100	1-1-1 (2)	0
			SS 7	100	3-2-3-3 (5)	0
	Bottom of boring at 20.0 feet.	20				

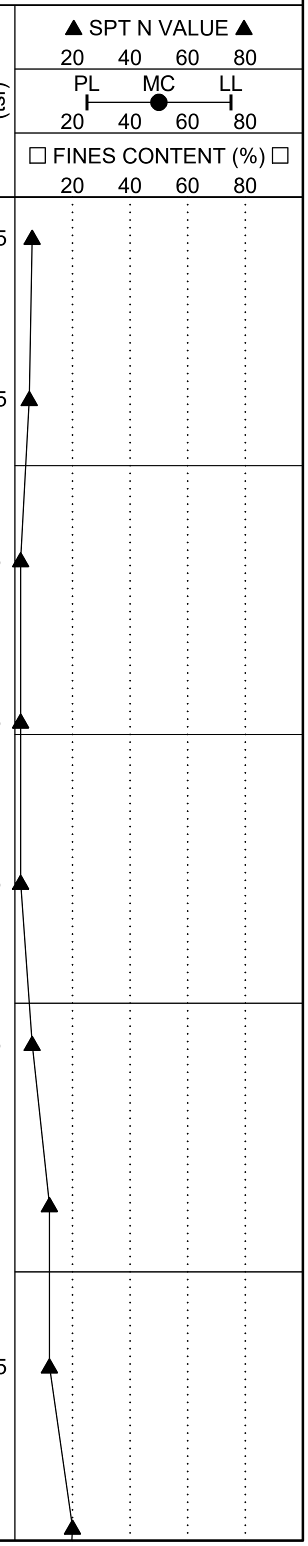
▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
☐ FINES CONTENT (%) ☐ 20 40 60 80

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-6

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 11/9/18 **COMPLETED** 11/9/18
GROUND ELEVATION 805.6 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger & SPT
AT END OF SOIL SAMPLING --- N/A
CEC REP LDC **CHECKED BY** CEH
AT END OF CORING --- N/A
NOTES
24hrs AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
805		Brown silty CLAY, trace rock fragments, moist, very soft to medium stiff, **(FILL)**	0	SS 1	47	2-2-4 (6)	0.75
				SS 2	47	2-3-2 (5)	0.75
800			5	SS 3	67	2-1-1 (2)	0.5
795		Dark gray to black sandy SILT, some clay, trace roots and rock fragments, moist, very soft to stiff, **(FILL)**	10	SS 4	100	1-1-1 (2)	.25
				SS 5	80	2-1-1 (2)	.25
790			15	SS 6	93	2-2-4 (6)	.25
		Gray CLAY, trace rock fragments, moist, stiff, **(FILL)**		SS 7	67	2-4-8 (12)	1
785			20				
		Dark brown to brown CLAY, trace rock and coal fragments, moist, stiff to very stiff, **(FILL)**		SS 8	100	2-4-8 (12)	1.25
			25	SS	100	9-9-11	2



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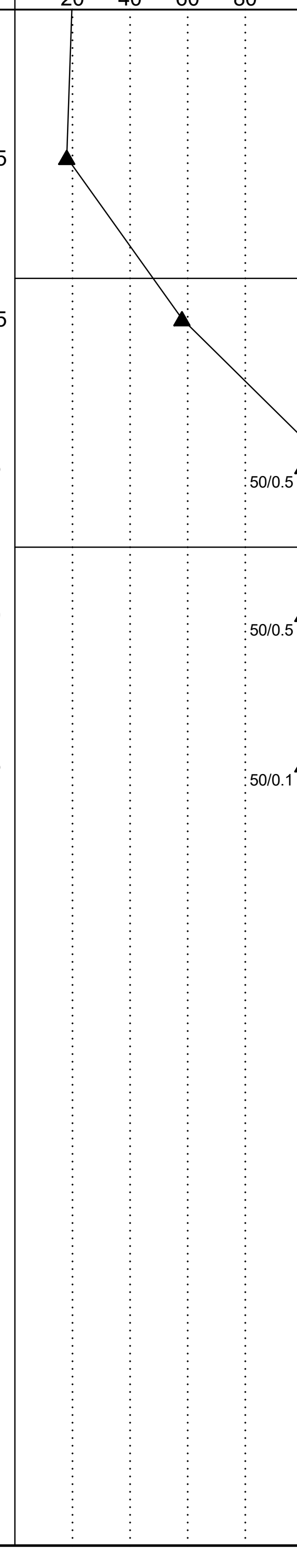
Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-6

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
780		Dark brown to brown CLAY, trace rock and coal fragments, moist, stiff to very stiff, **(FILL)** *(continued)*	25	9		(20)	
		Reddish brown gravelly CLAY, moist, very stiff, **(FILL)**		SS 10	100	8-8-10 (18)	1.75
775		Reddish brown with gray mottling CLAY, trace rock fragments, dry to moist, hard, *Probable decomposed claystone*, **(RESIDUAL SOIL)**	30	SS 11	100	18-23-35 (58)	2.75
		Reddish brown with gray mottling decomposed CLAYSTONE, dry, hard, **(RESIDUAL SOIL)**		SS 12	70	27-50/0.5	2.5
770		Reddish brown with gray mottling weathered CLAYSTONE, dry, **(BEDROCK)**	35	SS 13	100	50/0.5	3.0
				SS 14	100	50/0.1	4.5
		Bottom of boring at 39.1 feet.					

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80



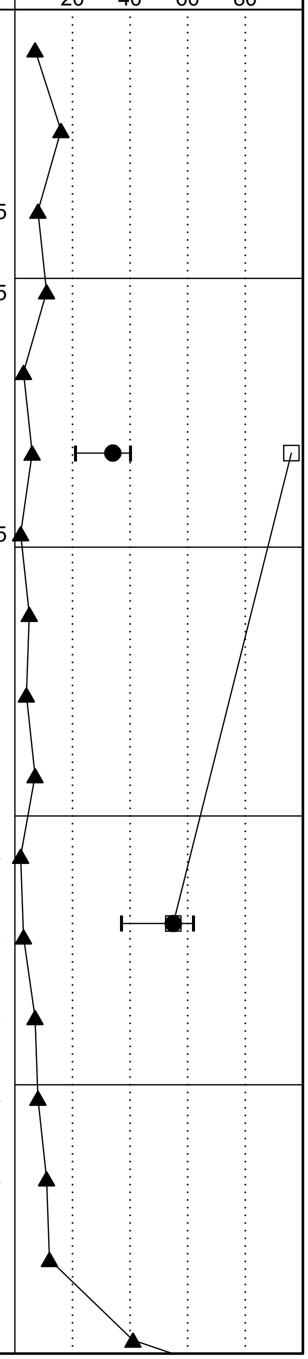
Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-13

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 7/8/19 **COMPLETED** 7/8/19
GROUND ELEVATION 806 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger & SPT
AT END OF SOIL SAMPLING --- Boring collapsed at 12.7 feet bgs
CEC REP JIO **CHECKED BY** JBB
AT END OF CORING --- Not Applicable
NOTES Elevation estimated from topographic survey
24hrs AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
		Topsoil - 0.4 feet	0				
805		Dark gray and brown CLAY, some rock fragments, trace sand, moist, medium stiff to very stiff, *Brick fragments observed in split-spoon samples*, **(FILL)** *Drill action indicates presence of probable cobble between 1.5 - 2.0 feet bgs*		SS 1	80	0-3-4 (7)	
				SS 2	100	5-9-7 (16)	
		Dark grayish brown CLAY, trace sand and rock fragments, moist, medium stiff, **(FILL)**		SS 3	80	9-4-4 (8)	3.25
		Dark brown and gray CLAY, some rock fragments, trace sand, moist, stiff, **(FILL)**	5	SS 4	73	4-6-5 (11)	1.25
800		Grayish brown CLAY, moist to wet, soft to medium stiff, **(FILL)**		SS 5	87	3-1-2 (3)	.5
				SS 6	60	3-3-3 (6)	.5
		Brown CLAY, trace sand and rock fragments, moist, very soft, **(FILL)**	10	SS 7	27	1-1-1 (2)	1.75
795		Grayish brown silty CLAY, some rock fragments, trace sand, moist to wet, soft to medium stiff, *Slag and brick fragments observed in split-spoon samples*, **(FILL)**		SS 8	47	1-3-2 (5)	
				SS 9	100	1-2-2 (4)	
			15	SS 10	67	3-4-3 (7)	
790		Brown sandy ELASTIC SILT, trace wood fragments, moist to wet, very soft to medium stiff, *Organic odor detected from split-spoon samples*, **(FILL)**		SS 11	100	0-1-1 (2)	.25
				SS 12	40	1-1-2 (3)	0.0
				SS 13	73	0-3-4 (7)	0.0
		Dark grayish brown CLAY, trace sand and rock fragments, wet, medium stiff to stiff, *Wet split spoon observed, **(FILL)***	20	SS 14	73	4-4-4 (8)	2.5
785				SS 15	100	2-5-6 (11)	2.5
		Brown clayey ROCK FRAGMENTS, some sand, moist to wet, medium dense, **(FILL)**		SS 16	80	3-5-7 (12)	
		Reddish brown decomposed CLAYSTONE, dry to moist, hard, **(RESIDUAL SOIL)**	25	SS	100	14-22-19	

▲ SPT N VALUE ▲ (20 40 60 80)
PL MC LL (20 40 60 80)
☐ FINES CONTENT (%) ☐ (20 40 60 80)



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Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-13

CLIENT Pittsburgh Water & Sewer Authority

PROJECT NAME Four Mile Run Green Stormwater Infrastructure

PROJECT NUMBER 174-960

PROJECT LOCATION Panther Hollow, Pittsburgh PA

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
		Reddish brown decomposed CLAYSTONE, dry to moist, hard, **(RESIDUAL SOIL)** *(continued)*	25	17		(41)		
780				SS 18	100	15-50/0.5		50/0.5
		Reddish brown weathered CLAYSTONE, dry, **(BEDROCK)**		SS 19	100	18-50/0.4		50/0.4

Bottom of boring at 27.9 feet.

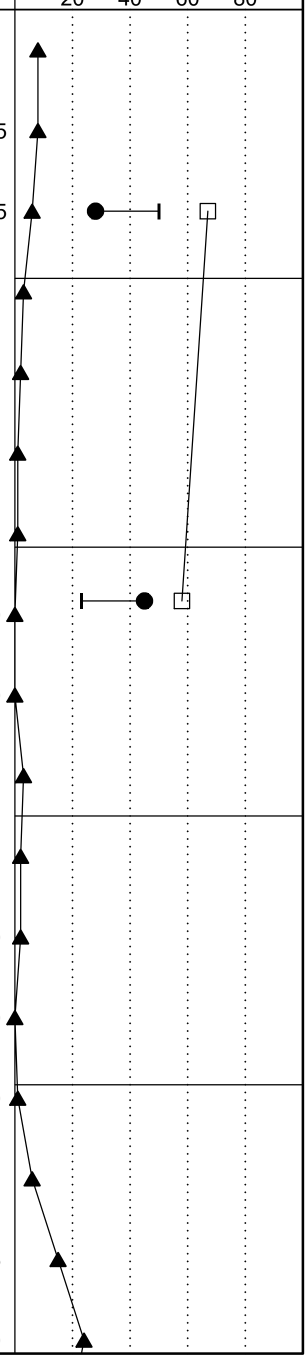
Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-14

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 7/9/19 **COMPLETED** 7/9/19
GROUND ELEVATION 807 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger & SPT
▽ **AT END OF SOIL SAMPLING** 12.8 ft / Elev 794.2 ft
CEC REP JIO **CHECKED BY** JBB
AT END OF CORING --- Not Applicable
NOTES Elevation estimated from topographic survey
24hrs AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
		Topsoil - 0.3 feet Dark brown SILT, some clay, trace rock fragments and roots, moist, medium stiff, **(FILL)**	0	SS 1	53	1-3-5 (8)	
805		Dark gray and brown FAT CLAY, some sand and rock fragments, moist, medium stiff, **(FILL)**		SS 2	87	5-4-4 (8)	2.25
				SS 3	53	2-3-3 (6)	1.25
		Dark gray and brown clayey SAND, trace rock fragments, moist, very loose, **(FILL)**	5	SS 4	53	2-2-1 (3)	
800		Dark gray ROCK FRAGMENTS, some sand and silt, trace organics, moist to wet, very loose, **(FILL)**		SS 5	60	3-1-1 (2)	
		Dark brown and black silty SAND, wet, very loose, **(FILL)**		SS 6	53	0-0-1 (1)	
			10	SS 7	0	0-0-1 (1)	
795		Dark brown sandy CLAY, trace rock fragments and organics, wet, very soft, **(FILL)**		SS 8	47	0-0-0 (0)	0.0
	▽	Dark grayish brown and black sandy SILT, wet, very soft to medium stiff, **(FILL)** *Plastic observed in SS-9*		SS 9	60	0-0-0 (0)	0.0
			15	SS 10	67	0-0-3 (3)	.5
				SS 11	60	1-1-1 (2)	
790		*Coal fragments observed in SS-12*		SS 12	100	1-1-1 (2)	0.0
				SS 13	80	0-0-0 (0)	0.0
			20	SS 14	100	0-0-1 (1)	0.0
785		*Wet split-spoon observed at SS-15*		SS 15	100	4-3-3 (6)	
		Grayish brown CLAY, trace rock fragments, moist, stiff, **(FILL)**		SS 16	100	4-6-9 (15)	3.5
		Reddish brown and gray CLAY, some sand and rock fragments, moist to wet, very stiff, **(FILL)**	25	SS	100	5-11-13	3.0

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
□ FINES CONTENT (%) □ 20 40 60 80



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Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

BORING NUMBER B-14

CLIENT Pittsburgh Water & Sewer Authority

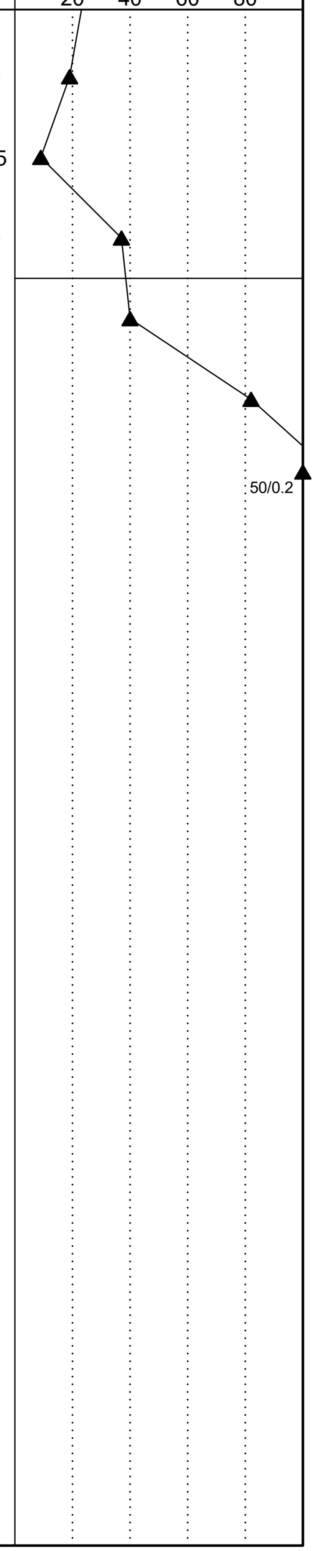
PROJECT NAME Four Mile Run Green Stormwater Infrastructure

PROJECT NUMBER 174-960

PROJECT LOCATION Panther Hollow, Pittsburgh PA

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
		Reddish brown and gray CLAY, some sand and rock fragments, moist to wet, very stiff, **(FILL)** *(continued)*	25	17		(24)	
780				SS 18	67	7-8-11 (19)	3.0
		Reddish brown and brown clayey ROCK FRAGMENTS, some sand, moist to wet, loose, **(FILL)**		SS 19	80	4-5-4 (9)	3.25
		Reddish brown and red decomposed CLAYSTONE, dry to moist, hard, **(RESIDUAL SOIL)**		SS 20	80	9-17-20 (37)	4.0
			30	SS 21	73	8-18-22 (40)	
775				SS 22	100	16-40-42 (82)	
				SS 23	100	10-40-50/0.2	
		Bottom of boring at 34.2 feet.					

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80



BORING NUMBER B-30

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 9/30/19 **COMPLETED** 9/30/19
GROUND ELEVATION 809 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger
AT END OF SOIL SAMPLING --- Dry
CEC REP JIO **CHECKED BY** JBB
AT END OF CORING --- Not Applicable
NOTES Elevation estimated from topographic survey
AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
			0				
				AU			
805			5				
		Pushed shelby tube between 6 - 8 feet bgs. Down pressure: 0 - 250 psi; Recovery: 1.6 feet. Offset 3' and augered down to 6 feet bgs. Pushed second tube between 6 - 8 feet bgs. Down pressure: 0 - 300 psi; Recovery: 1.3 feet.		ST 1			
800							
			10	AU			
		Pushed shleby tube between 12 - 14 feet bgs. Down pressure: 0 - 300 psi; Recovery: 0.0 feet.		ST 2			
795							
		Bottom of boring at 14.0 feet.					

BORING NUMBER B-31

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA
DATE STARTED 9/30/19 **COMPLETED** 9/30/19
GROUND ELEVATION 809 ft **BACKFILL** Cuttings
SOIL SAMPLING CONTRACTOR Terra Testing
WATER LEVELS:
SOIL SAMPLING METHOD Hollow Stem Auger
AT END OF SOIL SAMPLING --- Dry
CEC REP JIO **CHECKED BY** JBB
AT END OF CORING --- Not Applicable
NOTES Elevation estimated from topographic survey
AFTER DRILLING --- Backfilled Immediately

ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
			0	AU			
805		**Pushed shelby tube between 3 - 5 feet bgs. Down pressure: 0 - 250 psi; Recovery: 1.9 feet.**	5	ST 1			
				AU			
800		**Pushed shelby tube between 8 - 10 feet bgs. Down pressure: 0 - 500 psi; Recovery: 1.6 feet. Offset 3' and augered down to 8 feet bgs. Pushed second tube between 8 - 10 feet bgs. Down pressure: 0 - 325 psi; Recovery: 1.7 feet.**	10	ST 2			
				AU			
795		**Pushed shelby tube between 15 - 17 feet bgs. Down pressure: 0 - 400 psi; Recovery: 1.2 feet.**	15	ST 3			
		Bottom of boring at 17.0 feet.					

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

WELL NUMBER CEC PZ-1

CLIENT Pittsburgh Water & Sewer Authority
PROJECT NAME Four Mile Run Green Stormwater Infrastructure
PROJECT NUMBER 174-960
PROJECT LOCATION Panther Hollow, Pittsburgh PA

DATE STARTED 6/11/18 **COMPLETED** 6/11/18
ELEVATION 807.1 ft **CASING ELEVATION** 807.10 ft
SOIL SAMPLING CONTRACTOR AWK Drilling
WELL INSTALLED Yes **STICKUP** 0 ft above
SOIL SAMPLING METHOD Hollow Stem Auger & SPT
OUTER CASING 2", PVC
DRILLER Toby **CEC REP** EAM
DEVELOPMENT METHOD surging
DIAMETER **CORE SIZE**
RESULTS slightly cloudy
BACKFILL 2" Piezometer
YIELD 3 gal
MONITORING EQUIPMENT
LATITUDE **LONGITUDE**
KEY #
WATER LEVELS
NOTES
BEFORE CORING ---
AT END OF SOIL SAMPLING 14.1 ft / Elev 793.0 ft
AFTER SOIL SAMPLING ---
WELL ON 12/27/2018 4.0 ft / Elev 803.1 ft

DEPTH (ft)	SAMPLE TYPE	SAMPLE ID	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG
0	SS	1	55	1-3-4-6 (7)	
	AU				
5	SS	2	80	6-3-3-4 (6)	
	AU				
	SS	3	75	1-1-0-0 (1)	
	AU				
10	SS	4	90	0-0-0-0 (0)	
	AU				
	SS	5	95	0-0-1-3 (1)	
15	AU				
	SS	6	100	6-6/0.5	

MATERIAL DESCRIPTION

0.3 — Topsoil - 0.3 ft — 806.8

0.5 — Black SAND AND GRAVEL, moist, loose, **(FILL)** — 806.6

Dark brown silty CLAY, dry to moist, medium stiff, **(FILL)**
Gravel-sized sandstone fragments observed

Gray streaks and some gravel fragments observed between approximately 3 - 4 feet bgs

4.0 — 803.1

Black SILT, moist to wet, very soft to medium stiff, *Trace sand observed between approximately 4 - 5 feet bgs*, **(FILL)**

Some gravel fragments observed between approximately 6 - 8 feet bgs

13.0 — 794.1

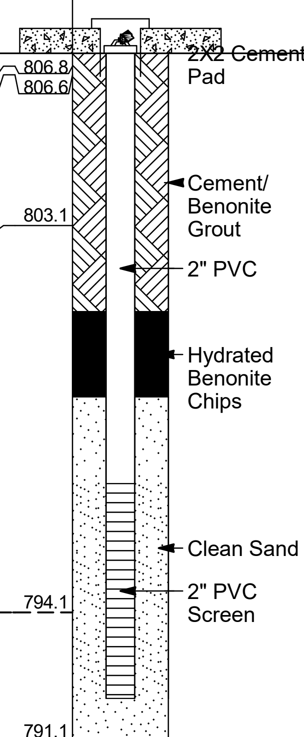
Black to brown CLAY AND SILT, moist, very soft to stiff, **(FILL)**

Trace gravel observed at approximately 15.0 feet bgs

16.0 — 791.1

Bottom of boring at 16.0 feet.

WELL DIAGRAM



pennsylvania DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

PG/PE Seal, Signature and Date

Boring **B-10** ECMS

District: County: Allegheny

SR Section

Baseline:

Sta. Offset

Segment Offset

Coordinates:

Lat. Long.

1356423.0390 E 409634.3070 N

Ground Elev. 805.9 ft.

Water Level Elev./Elapsed Time:

Initial 795.5 ft. Elapsed 0.0 hr.

Final 796.6 ft. Elapsed 48.3 hr.

Driller: B. Jones

Company: AWK Drilling, Inc.

Drilling Start: 01/10/2017 12:15 pm

Drilling Complete: 01/10/2017 1:30 pm

Grouting Complete: 01/13/2017 1:50 pm

Rig: CME 550

Hammer Type: Automatic

SPT Hammer Efficiency:

Assumed 0.8 Measured

Hammer Calibration Date:

Hole Type: Continuous SPT

Casing Type: Hollow Stem Auger

Casing I.D.: 3.25 in Casing Depth: 24.0 ft.

Rock Core Method:

Inspector: Jeremy Hamborsky

Inspector Cert. No. 259-11

Final Log Checked and Approved

By: Tyler Reynolds

Date: 1/24/2017

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
805		**TOPSOIL** 0.2'/El. 805.7			S-1	14-10-10 **Pen=2.00 tsf**	27	1.5	100	
		CLAY and medium **GRAVEL**, little Sand, very stiff, damp to moist, homogeneous, uniformly graded, rounded, medium plastic fines, dark brown gray, fill.	a-6 / cl	1.5	S-2	6-7-7 **Pen=2.00 tsf**	19	1.5	100	
				3.0	S-3	6-6-8 **Pen=2.00 tsf**	19	1.5	100	
		4.8'/El. 801.1		4.5	S-4	3-2-2 **Pen=1.00 tsf**	5	1.5	100	
800		**SAND** and **CLAY**, little Gravel, very loose to loose, damp to wet, homogeneous, uniformly graded, rounded to sub-rounded, medium plastic fines, dark gray black, fill.	a-2-6 / sc	6.0	S-5	2-1-1 **Pen=0.00 tsf**	3	1.5	100	
		-S-6: wood in tip.		7.5	S-6	4-3-2	7	1.0	67	
				9.0	S-7	1-1-1 **Pen=0.00 tsf**	3	1.5	100	
795				10.5	S-8	1-WOH-WOH **Pen=0.00 tsf**	0	0.4	27	
				12.0	S-9	WOH-WOH-1 **Pen=0.00 tsf**	1	1.5	100	
				13.5	S-10	1-1-1 **Pen=0.50 tsf**	3	1.5	100	

NOTE: -1 BULK SAMPLE OBTAINED 5.0' TO 15.0' pennsylvania DEPARTMENT OF TRANSPORTATION

ENGINEER'S LOG

Boring **B-10** ECMS ______ District: ______ County: Allegheny

SR ______ Section ______

Sta. ______ Offset ______

NOTE: N values and all graphical plots are for information only.

ELEV.	GRAPHIC	MATERIAL DESCRIPTION COMMENTS - OBSERVATIONS	AASHTO / USCS	SAMPLE DEPTH	SAMPLE No.	BLOW COUNTS (Blows/ 0.5ft)	N_{60} --- RQD %	REC (ft.)	REC (%)	◇ RQD % ◇ ⊙ Soil/Rock Rec.% ⊙ 20 40 60 80 ▲ SPT (N_{60}) ▲ 10 20 30 40
790		**SAND** and **CLAY**, little Gravel, very loose to loose, damp to wet, homogeneous, uniformly graded, rounded to sub-rounded, medium plastic fines, dark gray black, fill. *(Layer continued from the previous page.)* 20.3'/El. 785.6	a-2-6 / sc	15.0	S-11	WOH-WOH-WOH **Pen=0.00 tsf**	0	1.5	100	
				16.5	S-12	1-1-1 **Pen=0.00 tsf**	3	1.3	87	
				18.0	S-13	1-3-3 **Pen=0.00 tsf**	8	1.5	100	
785		Medium **GRAVEL** and **CLAY**, little Sand, medium dense, damp to wet, homogeneous, well graded, gray dark brown tan, fill. 25.5'/El. 780.4	a-2-6 / gc	19.5	S-14	2-3-5 **Pen=2.00 tsf**	11	1.5	100	
				21.0	S-15	3-5-7 **Pen=2.00 tsf**	16	1.3	87	
				22.5	S-16	6-8-13 **Pen=2.50 tsf**	28	1.2	80	
				24.0	S-17	6-8-10 **Pen=4.50 tsf**	24	1.5	100	
780		Bottom of boring.								
775										

NOTE: -1 BULK SAMPLE OBTAINED 5.0' TO 15.0'

APPENDIX D

LABORATORY TESTING RESULTS

PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	15.0' - 19.0'
Project No.	42276	Sample	S-11, 12, 13
		Lab Sample	42276001

Sample Color: **VERY DARK GRAY**
USCS Group Name: **SANDY ELASTIC SILT**
USCS Group Symbol: **MH** USDA: **LOAM** AASHTO: **A-7-5 (12)**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	584
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	4
Wet Wt Passing Split, gm	580
Dry Wt. Passing Split, gm	374
Total Sample Dry Wt, gm	378

Split Sample - Passing No. 4	
Tare No.	74
Tare + WS., gm	386.56
Tare + DS., gm	301.11
Tare, gm	145.92
Water Content of Split Sample	**55.1%**
Wt. of DS., gm	155.19
Wt. of +#200 Sample, gm	69.04

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	0	0.0%	100.0%	
1/2"	12.5	0	0.0%	100.0%	
3/8"	9.5	0	0.0%	100.0%	
No. 4	4.75	4.02	1.1%	98.9%	
No. 10	2	6.41	4.1%	94.9%	
No. 20	0.85	10.43	6.6%	88.2%	
No. 40	0.425	13.26	8.5%	79.7%	
No. 60	0.25	13.15	8.4%	71.4%	
No. 140	0.106	18.25	11.6%	59.7%	
No. 200	0.075	7.54	4.8%	54.9%	

HYDROMETER (-#200)

Tare No.	600	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	170.55	Wt. Dry Soil, gm (*-#200*)	23.93		Assumed
Wt. Tare, gm	141.62	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	23	25.2	4.6	18.4	0.0127	76.0	0.0316	41.8%
5	20	25.2	4.6	15.4	0.0127	63.6	0.0204	35.0%
15	18	25.2	4.6	13.4	0.0127	55.4	0.0119	30.4%
30	15.5	25.2	4.6	10.9	0.0127	45.0	0.0085	24.7%
60	13.5	25.1	4.6	8.9	0.0127	36.8	0.0061	20.2%
250	10	25.4	4.6	5.4	0.0126	22.3	0.0031	12.3%
1440	8.5	25	4.7	3.8	0.0127	15.7	0.0013	8.6%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**1.1**	Silt=37% Clay=17.9%	
Coarse=0; Fine=1.1		D60, mm	NA
% Sand (-#4 & +#200)	**44.0**	D30, mm	NA
Coarse=4.1; Medium=15.1; Fine=24.8		D10, mm	NA
% Fines (-#200)	**54.9**	Cc	NA
% Plus #200 (-3")	**45.1**	Cu	NA

USCS Description
SANDY ELASTIC SILT

USCS Group Symbol	Atterberg Limits Group Symbol
MH	MH - ELASTIC SILT

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	94.9
0.05	48.8
0.002	10.5

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	5.1	0
Sand	46.1	48.6
Silt	38.3	40.4
Clay	10.5	11.0

USDA Classification
LOAM

Performed By: VA/MAC Input Validation: JSJ Reviewed By: ALO Date Tested: 8/27/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	15.0' - 19.0'
Project No.	42276	Sample	S-11, 12, 13
		Lab Sample	42276001

Soil Description: VERY DARK GRAY ELASTIC SILT
(-#40 Fraction)

AS-RECEIVED W.C.

Tare Number	74
Wt. Tare & WS, gm	386.56
Wt. Tare & DS, gm	301.11
Wt. Tare, gm	145.92
Water Content, %	55.1

SAMPLE SUMMARY

Liquid Limit (LL), %	**62**
Plastic Limit (PL), %	**37**
Plasticity Index (PI)	**25**
USCS Group Symbol (*-#40 Fraction*)	**MH**
USCS Group Name (*-#40 Fraction*)	**ELASTIC SILT**
Sample Color:	**VERY DARK GRAY**

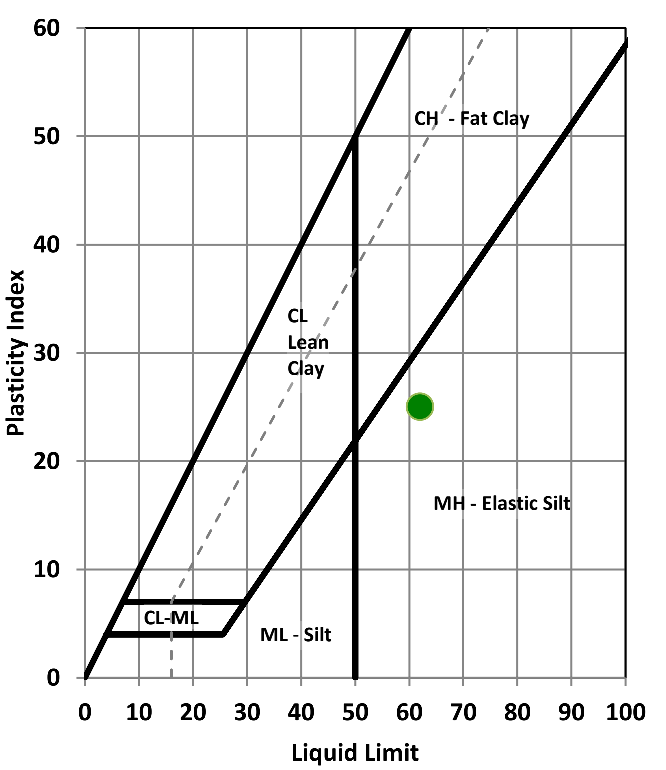
PLASTIC LIMIT

Points Run		3 Points	
Tare Number	411	424	332
Wt. Tare & WS, gm	17.80	18.02	18.02
Wt. Tare & DS, gm	15.87	16.07	16.19
Wt. Tare, gm	10.68	10.76	11.23
Water Content, %	37.2	36.7	36.9

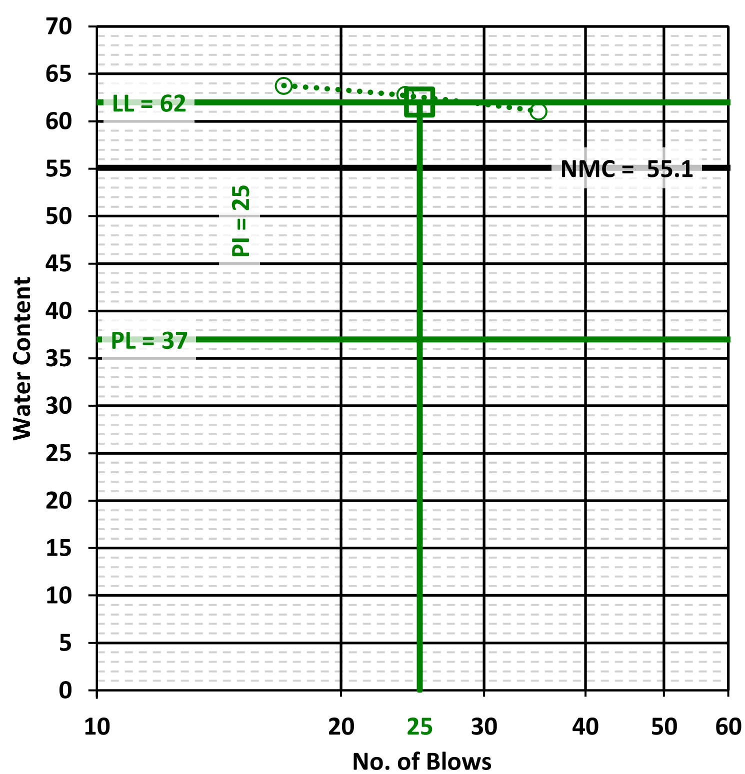
LIQUID LIMIT

		3 Points	
	339	403	308
	18.67	16.92	17.38
	15.79	14.54	15.00
	11.27	10.75	11.10
	63.7	62.8	61.0
# of Blows	17	24	35

PLASTICITY CHART



FLOW CURVE



Performed By: ZH	Input Validation: JSJ	Reviewed By: ALO	Date Tested: 8/27/2019

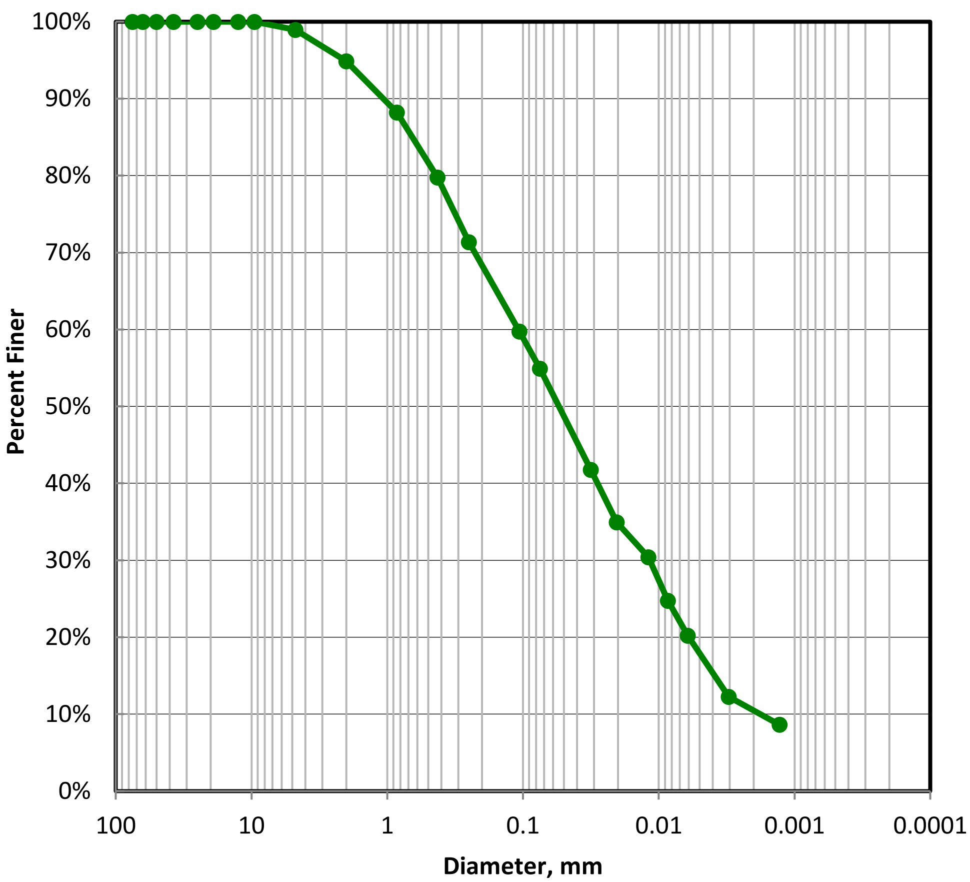
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	15.0' - 19.0'
Project No.	42276	Sample	S-11, 12, 13
		Lab Sample	42276001

Sample Color: **VERY DARK GRAY**

USCS Group Name: **SANDY ELASTIC SILT**

USCS Group Symbol: **MH** USDA: **LOAM** AASHTO: **A-7-5 (12)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	100.0%
3/8"	9.5	100.0%
No. 4	4.75	98.9%
No. 10	2	94.9%
No. 20	0.85	88.2%
No. 40	0.425	79.7%
No. 60	0.25	71.4%
No. 140	0.106	59.7%
No. 200	0.075	54.9%
NA	0.0316	41.8%
NA	0.0204	35.0%
NA	0.0119	30.4%
NA	0.0085	24.7%
NA	0.0061	20.2%
NA	0.0031	12.3%
NA	0.0013	8.6%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**1.1**	Silt=37% Clay=17.9%	
Coarse=0; Fine=1.1		D60, mm	NA
% Sand (-#4 & +#200)	**44.0**	D30, mm	NA
Coarse=4.1; Medium=15.1; Fine=24.8		D10, mm	NA
% Fines (-#200)	**54.9**	Cc	NA
% Plus #200 (-3")	**45.1**	Cu	NA

USCS Description

SANDY ELASTIC SILT

USCS Group Symbol	Atterberg Limits Group Symbol
MH	**MH - ELASTIC SILT**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	5.1	0
2	94.9			
		Sand	46.1	48.6
0.05	48.8			
		Silt	38.3	40.4
0.002	10.5			
		Clay	10.5	11.0

USDA Classification

LOAM

USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	15.0' - 19.0'
Project No.	42276	Sample	S-11, 12, 13
		Lab Sample	42276001

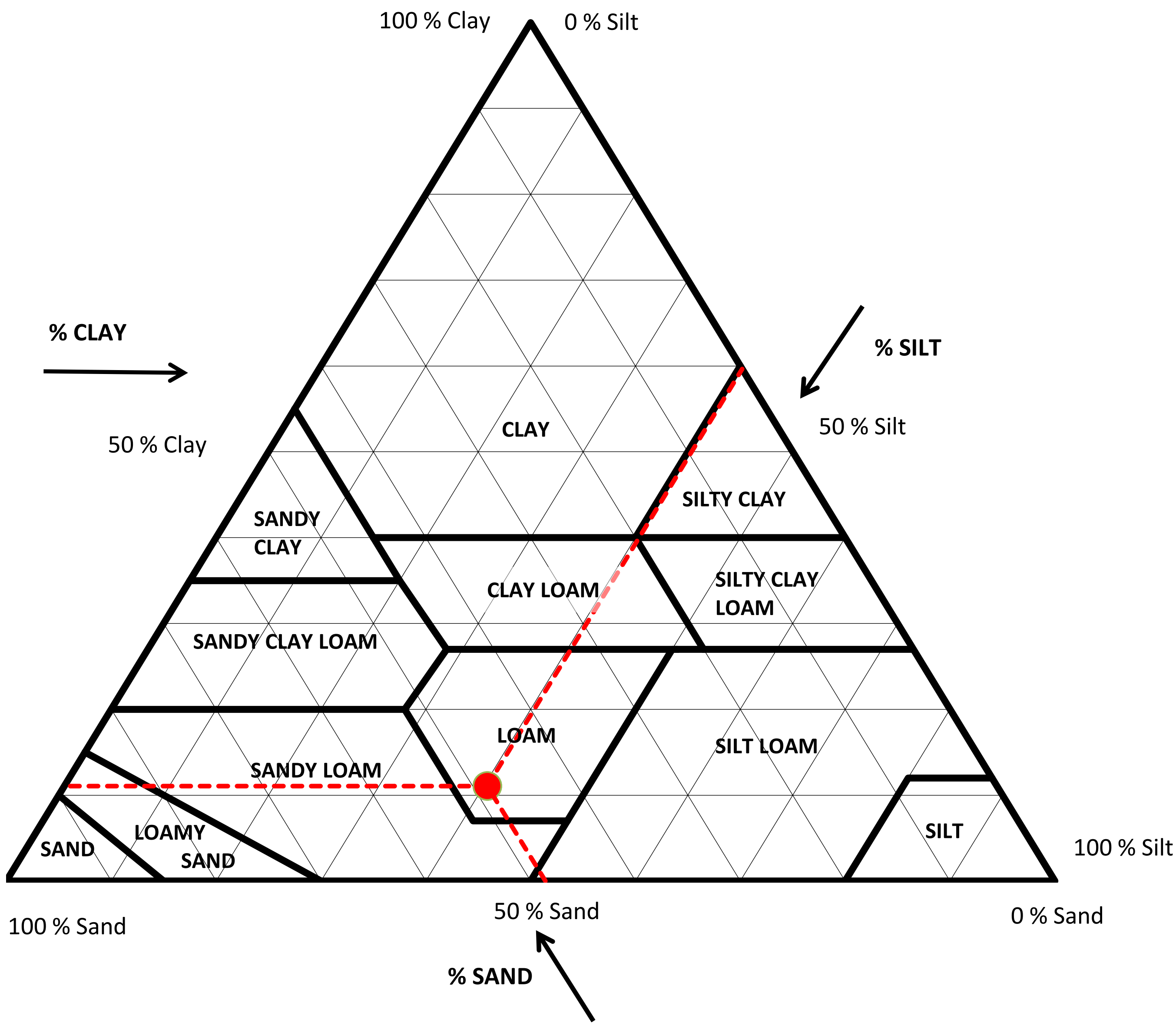
Sample Color: **VERY DARK GRAY**

USCS Group Name: **SANDY ELASTIC SILT**

USCS Group Symbol: **MH** USDA: **LOAM** AASHTO: **A-7-5 (12)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	48.6
Percent Silt, %	40.4
Percent Clay, %	11.0

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	5.7
Coarse Sand; 1-0.5	8.2
Medium Sand; 0.5-0.25	10.9
Fine Sand; 0.25-0.1	13.1
Very Fine Sand; 0.1-0.05	10.7
Total	**48.6**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	6.0' - 9.0'
Project No.	42276	Sample	SS-5, SS-6
		Lab Sample	42276002

Sample Color: **BROWN**
USCS Group Name: **LEAN CLAY**
USCS Group Symbol: **CL** USDA: **SILTY CLAY LOAM** AASHTO: **A-6 (19)**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	558
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	4
Wet Wt Passing Split, gm	553
Dry Wt. Passing Split, gm	412
Total Sample Dry Wt, gm	417
Split Sample - Passing No. 4	
Tare No.	2061
Tare + WS., gm	466.63
Tare + DS., gm	386.31
Tare, gm	150.78
Water Content of Split Sample	**34.1%**
Wt. of DS., gm	235.53
Wt. of +#200 Sample, gm	8.17

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	0	0.0%	100.0%	
1/2"	12.5	0	0.0%	100.0%	
3/8"	9.5	3.93	0.9%	99.1%	
No. 4	4.75	0.55	0.1%	98.9%	
No. 10	2	1.22	0.5%	98.4%	
No. 20	0.85	1.29	0.5%	97.9%	
No. 40	0.425	1.07	0.4%	97.4%	
No. 60	0.25	0.8	0.3%	97.1%	
No. 140	0.106	1.7	0.7%	96.4%	
No. 200	0.075	2.09	0.9%	95.5%	

HYDROMETER (-#200)

Tare No.	709	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	139.78	Wt. Dry Soil, gm (-#200)	38.27		Assumed
Wt. Tare, gm	96.51	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	35	25	4.7	30.3	0.0127	78.3	0.0290	74.8%
5	33	25	4.7	28.3	0.0127	73.1	0.0187	69.8%
15	30.5	25	4.7	25.8	0.0127	66.7	0.0110	63.7%
30	27	25	4.7	22.3	0.0127	57.6	0.0080	55.0%
60	24	25	4.7	19.3	0.0127	49.9	0.0057	47.6%
250	18	25.3	4.6	13.4	0.0126	34.6	0.0029	33.1%
1440	14	24.9	4.7	9.3	0.0127	24.0	0.0012	22.9%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**1.1**	Silt=50.8% Clay=44.7%	
Coarse=0; Fine=1.1		D60, mm	NA
% Sand (-#4 & +#200)	**3.4**	D30, mm	NA
Coarse=0.5; Medium=1; Fine=1.9		D10, mm	NA
% Fines (-#200)	**95.5**	Cc	NA
% Plus #200 (-3")	**4.5**	Cu	NA

USCS Description
LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
CL	CL - LEAN CLAY

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	98.4
0.05	86.6
0.002	28.6

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	1.6	0
Sand	11.8	12.0
Silt	58.1	59.0
Clay	28.6	29.0

USDA Classification
SILTY CLAY LOAM

Performed By: VA/MAC Input Validation: JSJ Reviewed By: ALO Date Tested: 8/27/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

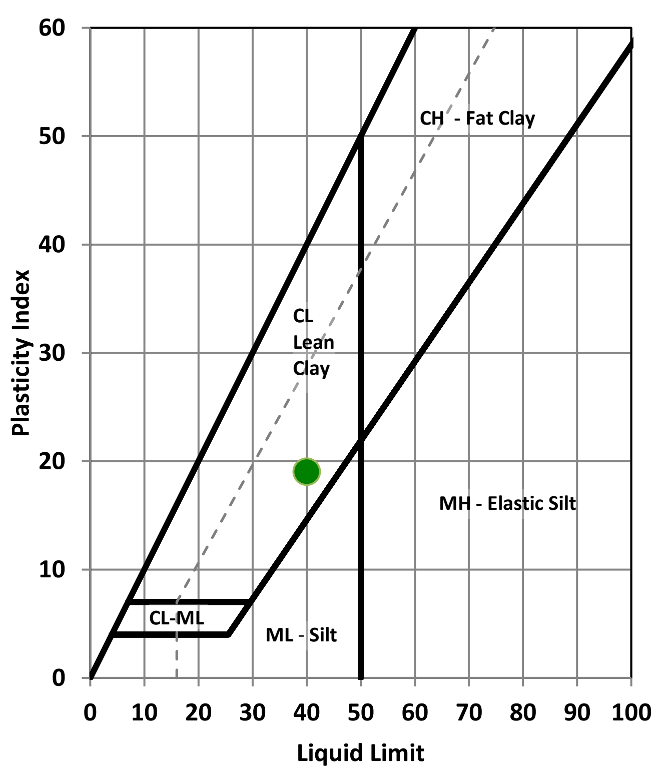
Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	6.0' - 9.0'
Project No.	42276	Sample	SS-5, SS-6
		Lab Sample	42276002

Soil Description: BROWN LEAN CLAY
(-#40 Fraction)

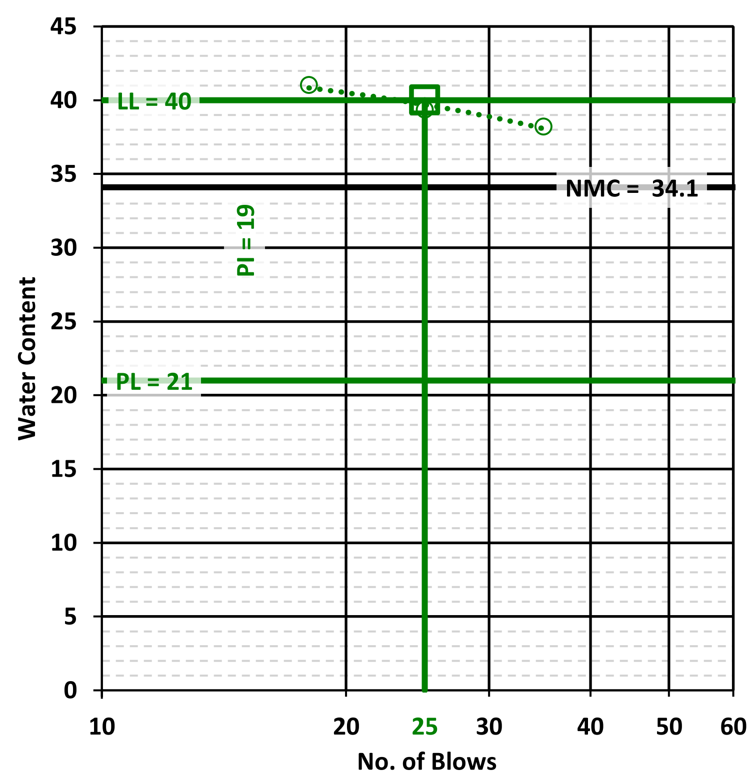
AS-RECEIVED W.C.		*SAMPLE SUMMARY*	
Tare Number	2061	Liquid Limit (LL), %	**40**
Wt. Tare & WS, gm	466.63	Plastic Limit (PL), %	**21**
Wt. Tare & DS, gm	386.31	Plasticity Index (PI)	**19**
Wt. Tare, gm	150.78	USCS Group Symbol (*-#40 Fraction*)	**CL**
Water Content, %	34.1	USCS Group Name (*-#40 Fraction*)	**LEAN CLAY**
		Sample Color:	**BROWN**

	PLASTIC LIMIT				*LIQUID LIMIT*		
Points Run		3 Points				3 Points	
Tare Number	324	706	469		409	702	493
Wt. Tare & WS, gm	18.99	18.82	17.46		18.32	20.34	18.46
Wt. Tare & DS, gm	17.61	17.68	16.28		16.10	18.12	16.32
Wt. Tare, gm	11.20	12.38	10.74		10.69	12.48	10.72
Water Content, %	21.5	21.5	21.3		41.0	39.4	38.2
				# of Blows	18	25	35

PLASTICITY CHART



FLOW CURVE



Performed By: ZH   Input Validation: JSJ   Reviewed By: ALO   Date Tested: 8/27/2019

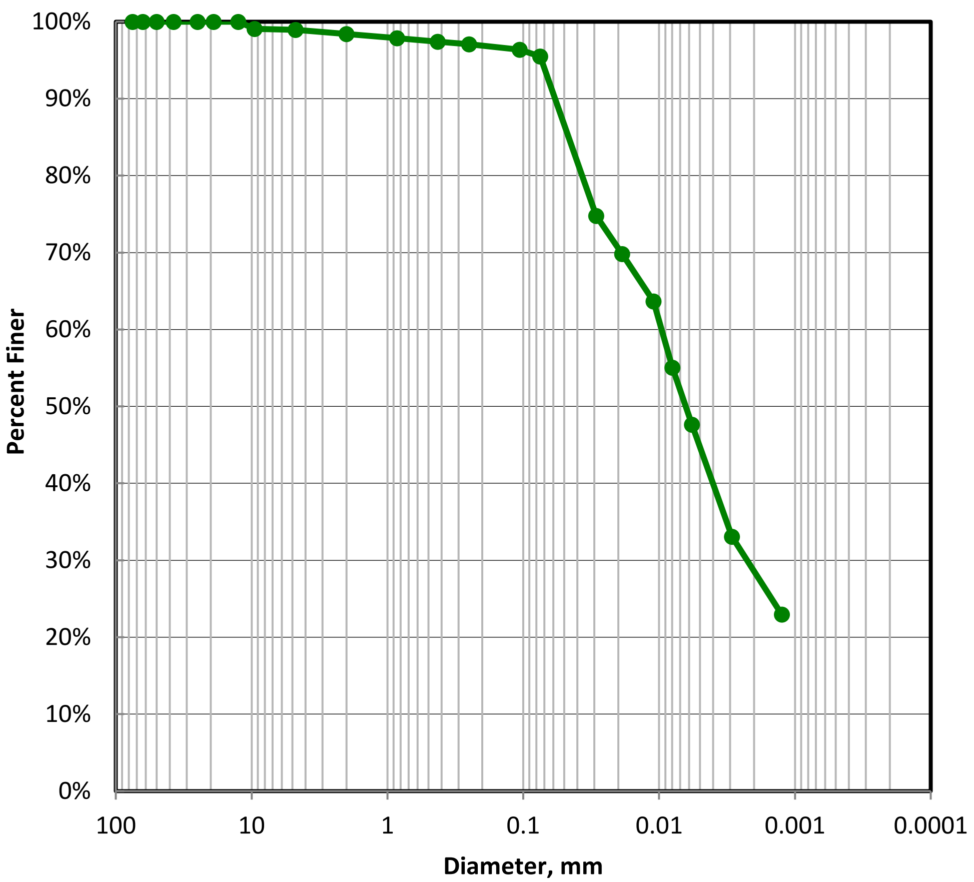
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	6.0' - 9.0'
Project No.	42276	Sample	SS-5, SS-6
		Lab Sample	42276002

Sample Color: **BROWN**

USCS Group Name: **LEAN CLAY**

USCS Group Symbol: **CL** USDA: **SILTY CLAY LOAM** AASHTO: **A-6 (19)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	100.0%
3/8"	9.5	99.1%
No. 4	4.75	98.9%
No. 10	2	98.4%
No. 20	0.85	97.9%
No. 40	0.425	97.4%
No. 60	0.25	97.1%
No. 140	0.106	96.4%
No. 200	0.075	95.5%
NA	0.0290	74.8%
NA	0.0187	69.8%
NA	0.0110	63.7%
NA	0.0080	55.0%
NA	0.0057	47.6%
NA	0.0029	33.1%
NA	0.0012	22.9%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**1.1**	Silt=50.8% Clay=44.7%	
Coarse=0; Fine=1.1		D60, mm	NA
% Sand (-#4 & +#200)	**3.4**	D30, mm	NA
Coarse=0.5; Medium=1; Fine=1.9		D10, mm	NA
% Fines (-#200)	**95.5**	Cc	NA
% Plus #200 (-3")	**4.5**	Cu	NA

USCS Description

LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
CL	CL - LEAN CLAY

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	1.6	0
2	98.4			
		Sand	11.8	12.0
0.05	86.6			
		Silt	58.1	59.0
0.002	28.6			
		Clay	28.6	29.0

USDA Classification

SILTY CLAY LOAM

USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-13
Client Project	174-960.001I - PWSA Four Mile Run	Depth	6.0' - 9.0'
Project No.	42276	Sample	SS-5, SS-6
		Lab Sample	42276002

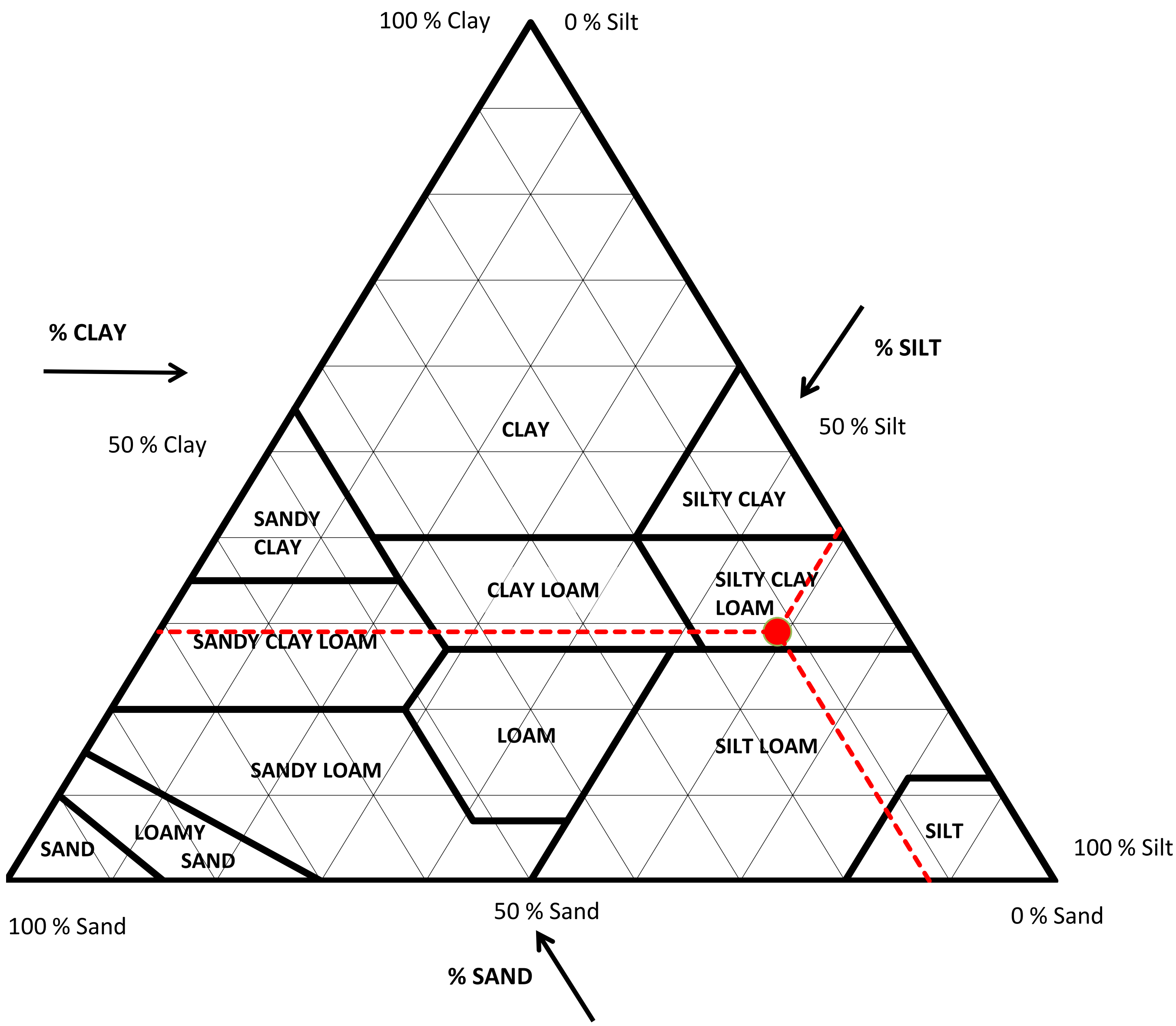
Sample Color: **BROWN**

USCS Group Name: **LEAN CLAY**

USCS Group Symbol: **CL** USDA: **SILTY CLAY LOAM** AASHTO: **A-6 (19)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	12.0
Percent Silt, %	59.0
Percent Clay, %	29.0

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	0.4
Coarse Sand; 1-0.5	0.5
Medium Sand; 0.5-0.25	0.4
Fine Sand; 0.25-0.1	0.9
Very Fine Sand; 0.1-0.05	9.7
Total	**12.0**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	1.5' - 4.5'
Project No.	42276	Sample	SS-2, SS-3
		Lab Sample	42276003

Sample Color: **VERY DARK GRAYISH BROWN**
USCS Group Name: **SANDY FAT CLAY**
USCS Group Symbol: **CH** USDA: **SILT LOAM** AASHTO: **A-7-6 (15)**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	387
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	44
Wet Wt Passing Split, gm	343
Dry Wt. Passing Split, gm	269
Total Sample Dry Wt, gm	313

Split Sample - Passing No. 4	
Tare No.	B04
Tare + WS., gm	194.26
Tare + DS., gm	170.46
Tare, gm	84.11
Water Content of Split Sample	**27.6%**
Wt. of DS., gm	86.35
Wt. of +#200 Sample, gm	19.04

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	9.83	3.1%	96.9%	
1/2"	12.5	11.58	3.7%	93.2%	
3/8"	9.5	6.6	2.1%	91.1%	
No. 4	4.75	16.37	5.2%	85.8%	
No. 10	2	4.24	4.2%	81.6%	
No. 20	0.85	3.49	3.5%	78.1%	
No. 40	0.425	2.94	2.9%	75.2%	
No. 60	0.25	2.67	2.7%	72.6%	
No. 140	0.106	3.96	3.9%	68.6%	
No. 200	0.075	1.74	1.7%	66.9%	

HYDROMETER (-#200)

Tare No.	939	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	135.97	Wt. Dry Soil, gm (*-#200*)	33.98		Assumed
Wt. Tare, gm	96.99	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	33.5	24.9	4.7	28.8	0.0127	83.8	0.0294	56.1%
5	32	24.9	4.7	27.3	0.0127	79.4	0.0188	53.1%
15	28.5	24.9	4.7	23.8	0.0127	69.3	0.0111	46.3%
30	25.5	24.9	4.7	20.8	0.0127	60.5	0.0080	40.5%
60	22	24.9	4.7	17.3	0.0127	50.3	0.0058	33.7%
250	17	25.3	4.6	12.4	0.0126	36.1	0.0029	24.1%
1440	13.5	24.9	4.7	8.8	0.0127	25.6	0.0013	17.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**14.2**	Silt=35.3% Clay=31.6%	
Coarse=3.1; Fine=11		D60, mm	NA
% Sand (-#4 & +#200)	**18.9**	D30, mm	NA
Coarse=4.2; Medium=6.4; Fine=8.3		D10, mm	NA
% Fines (-#200)	**66.9**	Cc	NA
% Plus #200 (-3")	**33.1**	Cu	NA

USCS Description
SANDY FAT CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
CH	CH - FAT CLAY

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	81.6
0.05	62.2
0.002	21.0

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	18.4	0
Sand	19.4	23.8
Silt	41.2	50.5
Clay	21.0	25.7

USDA Classification
SILT LOAM

Performed By: VA/MAC Input Validation: JSJ Reviewed By: ALO 'Date Tested: 8/27/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	1.5' - 4.5'
Project No.	42276	Sample	SS-2, SS-3
		Lab Sample	42276003

Soil Description: VERY DARK GRAYISH BROWN FAT CLAY
(-#40 Fraction)

AS-RECEIVED W.C.

Tare Number	B04
Wt. Tare & WS, gm	194.26
Wt. Tare & DS, gm	170.46
Wt. Tare, gm	84.11
Water Content, %	27.6

SAMPLE SUMMARY

Liquid Limit (LL), %	**50**
Plastic Limit (PL), %	**27**
Plasticity Index (PI)	**23**
USCS Group Symbol (*-#40 Fraction*)	**CH**
USCS Group Name (*-#40 Fraction*)	**FAT CLAY**
Sample Color:	**VERY DARK GRAYISH BROWN**

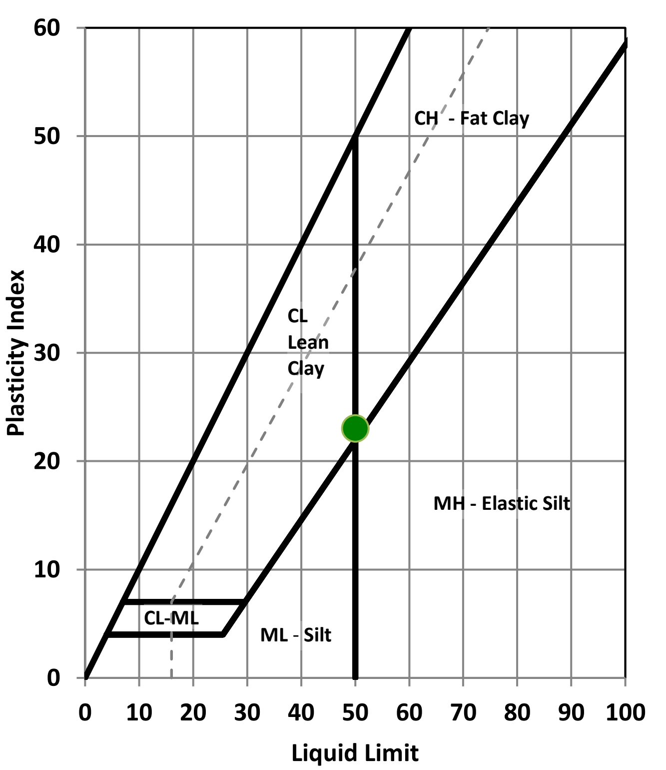
PLASTIC LIMIT

Points Run	3 Points		
Tare Number	333	331	334
Wt. Tare & WS, gm	18.64	17.99	17.80
Wt. Tare & DS, gm	17.09	16.56	16.41
Wt. Tare, gm	11.25	11.23	11.19
Water Content, %	26.5	26.8	26.6

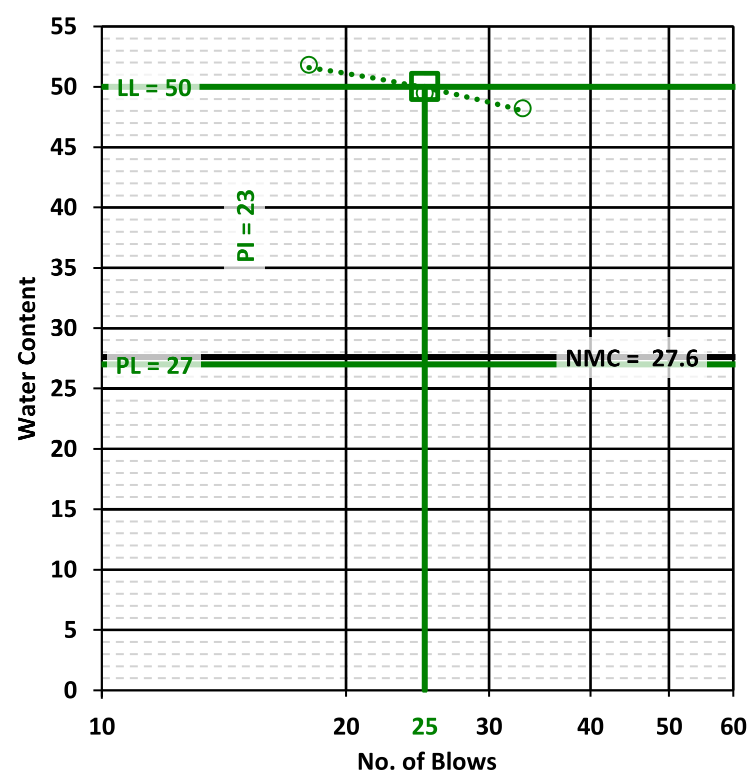
LIQUID LIMIT

	3 Points		
	429	456	470
	17.30	18.17	18.17
	15.02	15.76	15.74
	10.62	10.89	10.70
	51.8	49.5	48.2
# of Blows	18	25	33

PLASTICITY CHART



FLOW CURVE



Performed By: ZH Input Validation: JSJ Reviewed By: ALO 'Date Tested: 8/27/2019

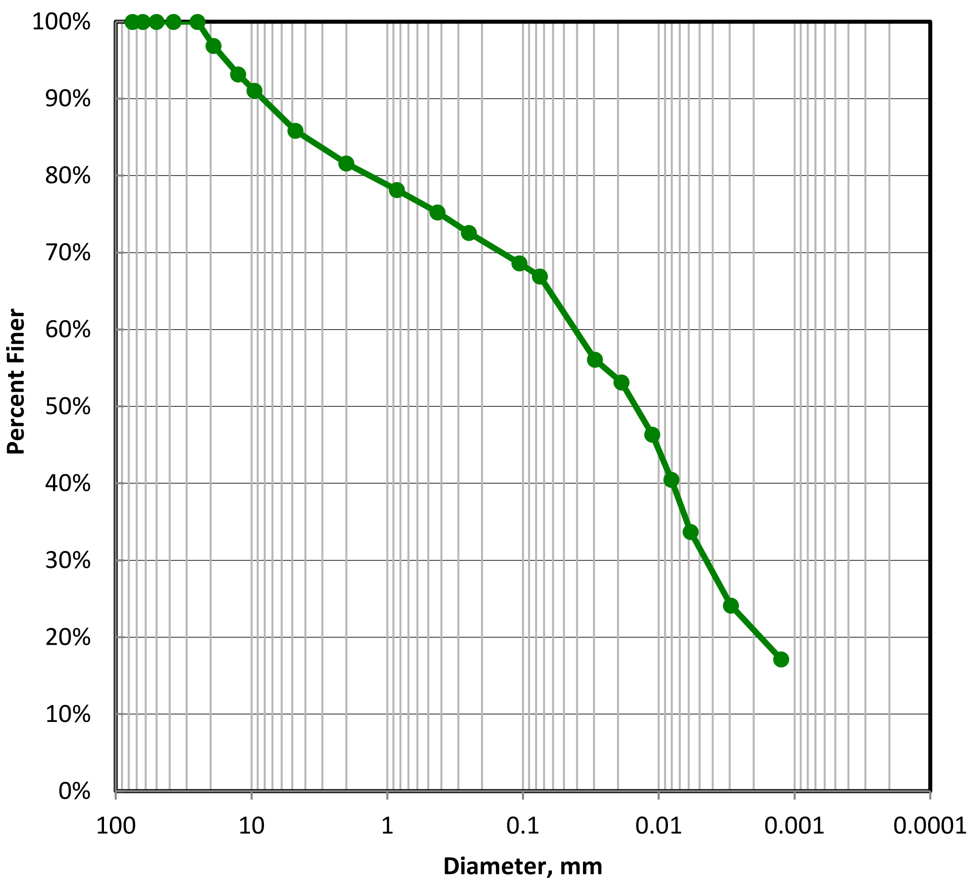
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	1.5' - 4.5'
Project No.	42276	Sample	SS-2, SS-3
		Lab Sample	42276003

Sample Color: **VERY DARK GRAYISH BROWN**

USCS Group Name: **SANDY FAT CLAY**

USCS Group Symbol: **CH** USDA: **SILT LOAM** AASHTO: **A-7-6 (15)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	96.9%
1/2"	12.5	93.2%
3/8"	9.5	91.1%
No. 4	4.75	85.8%
No. 10	2	81.6%
No. 20	0.85	78.1%
No. 40	0.425	75.2%
No. 60	0.25	72.6%
No. 140	0.106	68.6%
No. 200	0.075	66.9%
NA	0.0294	56.1%
NA	0.0188	53.1%
NA	0.0111	46.3%
NA	0.0080	40.5%
NA	0.0058	33.7%
NA	0.0029	24.1%
NA	0.0013	17.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	14.2	Silt=35.3% Clay=31.6%	
Coarse=3.1; Fine=11		D60, mm	NA
% Sand (-#4 & +#200)	18.9	D30, mm	NA
Coarse=4.2; Medium=6.4; Fine=8.3		D10, mm	NA
% Fines (-#200)	66.9	Cc	NA
% Plus #200 (-3")	33.1	Cu	NA

USCS Description

SANDY FAT CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
CH	CH - FAT CLAY

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	18.4	0
2	81.6			
		Sand	19.4	23.8
0.05	62.2			
		Silt	41.2	50.5
0.002	21.0			
		Clay	21.0	25.7

USDA Classification

SILT LOAM

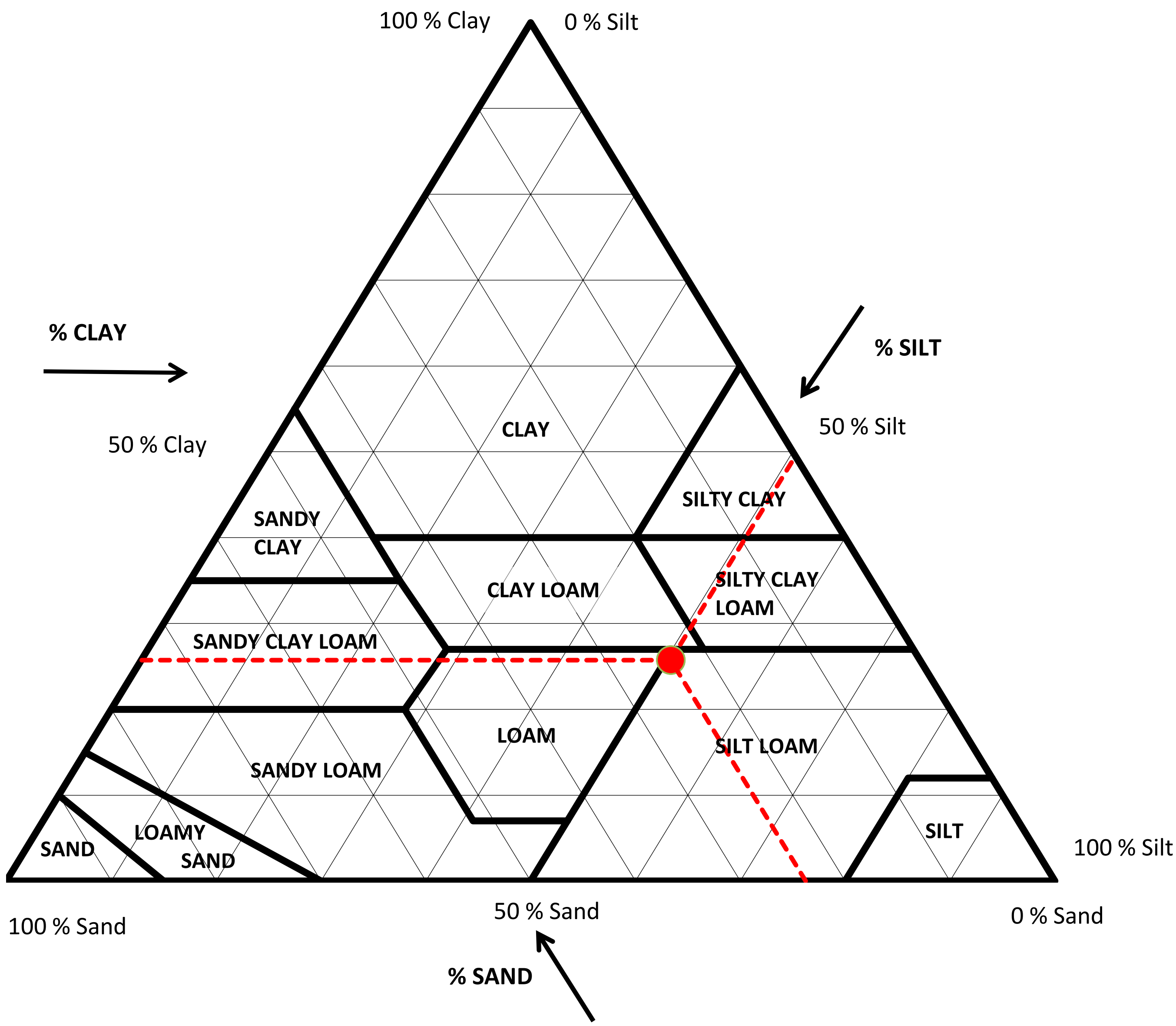
USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	1.5' - 4.5'
Project No.	42276	Sample	SS-2, SS-3
		Lab Sample	42276003

Sample Color: **VERY DARK GRAYISH BROWN**
USCS Group Name: **SANDY FAT CLAY**
USCS Group Symbol: **CH** USDA: **SILT LOAM** AASHTO: **A-7-6 (15)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	23.8
Percent Silt, %	50.5
Percent Clay, %	25.7

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	3.4
Coarse Sand; 1-0.5	3.5
Medium Sand; 0.5-0.25	4.1
Fine Sand; 0.25-0.1	5.2
Very Fine Sand; 0.1-0.05	7.5
Total	**23.8**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	10.0' - 12.0'
Project No.	42276	Sample	Shelby Tube
		Lab Sample	42276004

Sample Color: **BROWN**

USCS Group Name: **SANDY LEAN CLAY**

USCS Group Symbol: **CL** USDA: **LOAM** AASHTO: **A-7-6 (11)**

MECHANICAL SIEVE

Total Sample		Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
Total Sample Wet Wt, gm (-3")	297	3"	75	0	0.0%	100.0%	
Sample Split on Sieve	No. 4	2-1/2"	63	0	0.0%	100.0%	
Coarse Washed Dry Sample, gm	13	2"	50	0	0.0%	100.0%	
Wet Wt Passing Split, gm	284	1-1/2"	37.5	0	0.0%	100.0%	
Dry Wt. Passing Split, gm	196	1"	25	0	0.0%	100.0%	
Total Sample Dry Wt, gm	209	3/4"	19	0	0.0%	100.0%	
Split Sample - Passing No. 4		1/2"	12.5	0	0.0%	100.0%	
Tare No.	2015	3/8"	9.5	1.68	0.8%	99.2%	
Tare + WS., gm	279.69	No. 4	4.75	11.56	5.5%	93.7%	
Tare + DS., gm	239.82	No. 10	2	8.35	8.8%	84.8%	
Tare, gm	151.22	No. 20	0.85	5.76	6.1%	78.8%	
Water Content of Split Sample	**45.0%**	No. 40	0.425	5.33	5.6%	73.1%	
Wt. of DS., gm	88.60	No. 60	0.25	4.92	5.2%	67.9%	
		No. 140	0.106	6.84	7.2%	60.7%	
Wt. of +#200 Sample, gm	33.64	No. 200	0.075	2.44	2.6%	58.1%	

HYDROMETER (-#200)

Tare No.	577	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	221.63	Wt. Dry Soil, gm (*-#200*)	16.84		Assumed
Wt. Tare, gm	199.79	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	19	25.4	4.6	14.4	0.0126	84.6	0.0323	49.1%
5	17	25.3	4.6	12.4	0.0126	72.8	0.0207	42.3%
15	16	25.3	4.6	11.4	0.0126	66.9	0.0120	38.9%
30	15	25.3	4.6	10.4	0.0126	61.1	0.0086	35.5%
60	13	25.2	4.6	8.4	0.0127	49.3	0.0061	28.7%
250	11.5	25.4	4.6	6.9	0.0126	40.5	0.0030	23.5%
1440	10	23.4	5.1	4.9	0.0129	28.8	0.0013	16.7%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**6.3**	Silt=30.9% Clay=27.2%	
Coarse=0; Fine=6.3		D60, mm	NA
% Sand (-#4 & +#200)	**35.6**	D30, mm	NA
Coarse=8.8; Medium=11.7; Fine=15		D10, mm	NA
% Fines (-#200)	**58.1**	Cc	NA
% Plus #200 (-3")	**41.9**	Cu	NA

USCS Description

SANDY LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
CL	**CL - LEAN CLAY**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	84.8
0.05	53.8
0.002	20.2

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	15.2	0
Sand	31.1	36.6
Silt	33.6	39.6
Clay	20.2	23.8

USDA Classification

LOAM

Performed By: VA/MAC Input Validation: AR Reviewed By: ALO Date Tested: 8/27/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	10.0' - 12.0'
Project No.	42276	Sample	Shelby Tube
		Lab Sample	42276004

Soil Description: BROWN LEAN CLAY
(-#40 Fraction)

AS-RECEIVED W.C.

Tare Number	2015
Wt. Tare & WS, gm	279.69
Wt. Tare & DS, gm	239.82
Wt. Tare, gm	151.22
Water Content, %	45.0

SAMPLE SUMMARY

Liquid Limit (LL), %	**46**
Plastic Limit (PL), %	**23**
Plasticity Index (PI)	**23**
USCS Group Symbol (*-#40 Fraction*)	**CL**
USCS Group Name (*-#40 Fraction*)	**LEAN CLAY**
Sample Color:	**BROWN**

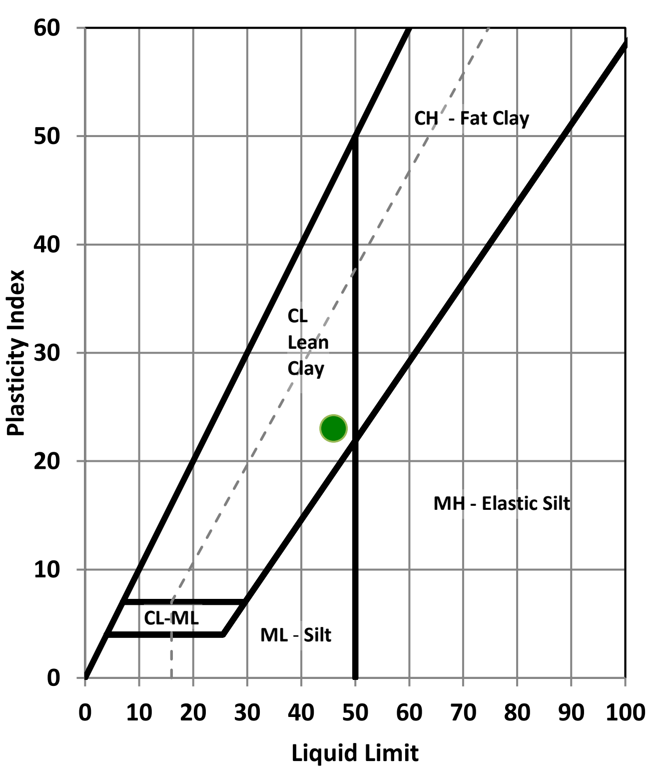
PLASTIC LIMIT

Points Run	3 Points		
Tare Number	334	409	456
Wt. Tare & WS, gm	18.34	16.86	17.62
Wt. Tare & DS, gm	17.02	15.71	16.38
Wt. Tare, gm	11.19	10.69	10.90
Water Content, %	22.6	22.9	22.6

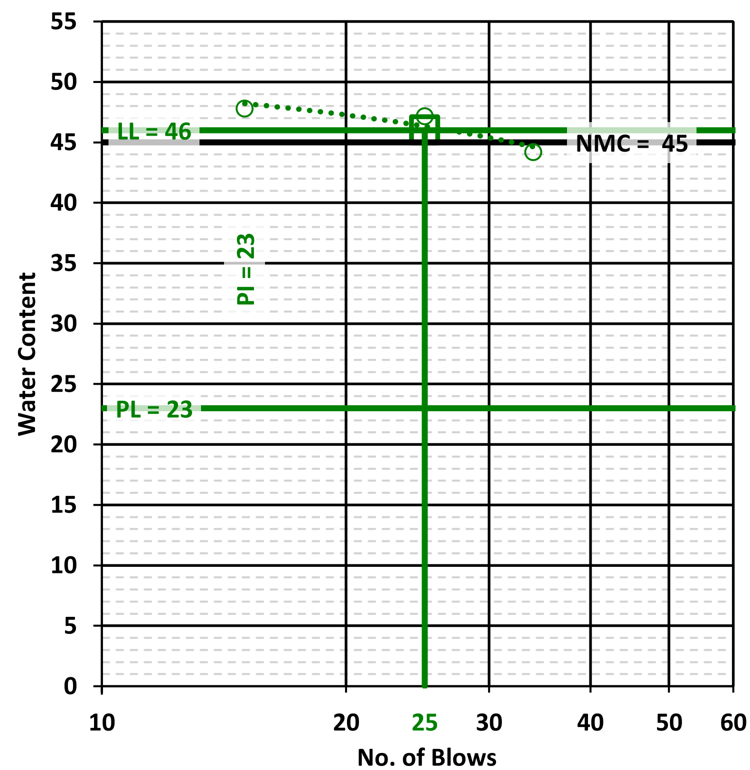
LIQUID LIMIT

	3 Points		
	309	426	339
	19.41	17.96	18.35
	16.79	15.96	16.18
	11.31	11.72	11.27
	47.8	47.2	44.2
# of Blows	15	25	34

PLASTICITY CHART



FLOW CURVE

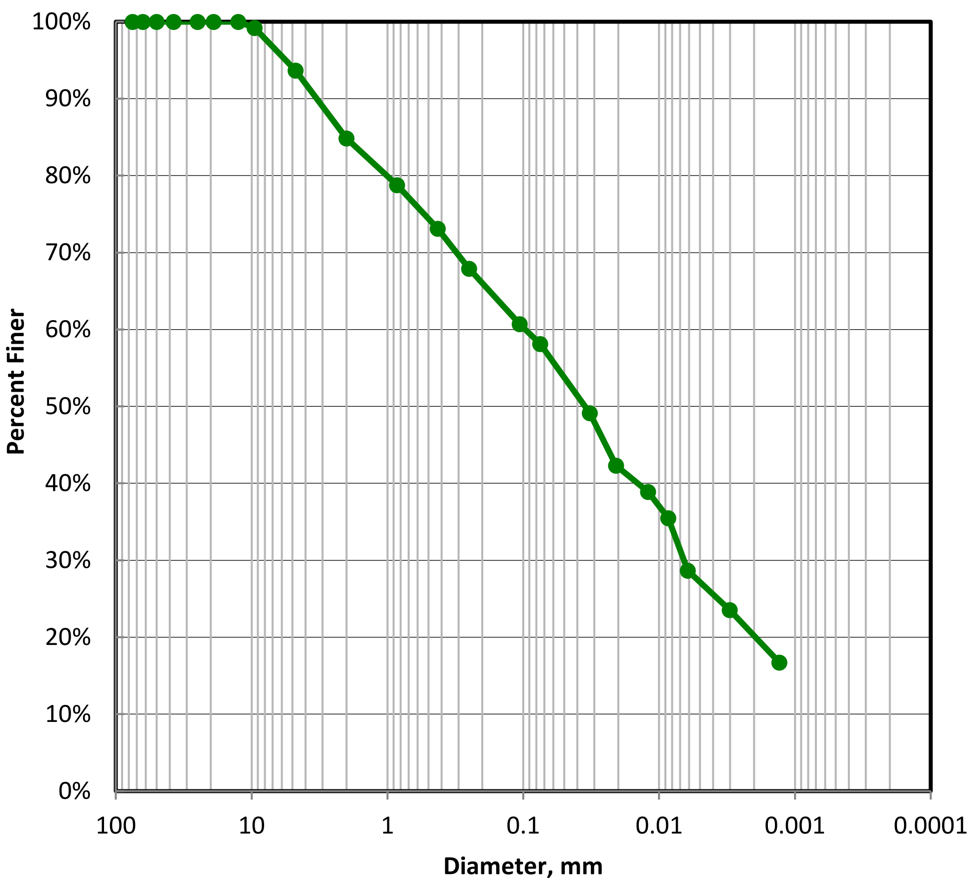


Performed By: ZH   Input Validation: JSJ   Reviewed By: ALO   Date Tested: 8/27/2019

PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	10.0' - 12.0'
Project No.	42276	Sample	Shelby Tube
		Lab Sample	42276004

Sample Color: **BROWN**
USCS Group Name: **SANDY LEAN CLAY**
USCS Group Symbol: **CL** USDA: **LOAM** AASHTO: **A-7-6 (11)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	100.0%
3/8"	9.5	99.2%
No. 4	4.75	93.7%
No. 10	2	84.8%
No. 20	0.85	78.8%
No. 40	0.425	73.1%
No. 60	0.25	67.9%
No. 140	0.106	60.7%
No. 200	0.075	58.1%
NA	0.0323	49.1%
NA	0.0207	42.3%
NA	0.0120	38.9%
NA	0.0086	35.5%
NA	0.0061	28.7%
NA	0.0030	23.5%
NA	0.0013	16.7%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**6.3**	Silt=30.9% Clay=27.2%	
Coarse=0; Fine=6.3		D60, mm	NA
% Sand (-#4 & +#200)	**35.6**	D30, mm	NA
Coarse=8.8; Medium=11.7; Fine=15		D10, mm	NA
% Fines (-#200)	**58.1**	Cc	NA
% Plus #200 (-3")	**41.9**	Cu	NA

USCS Description
SANDY LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
CL	CL - LEAN CLAY

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	15.2	0
2	84.8			
		Sand	31.1	36.6
0.05	53.8			
		Silt	33.6	39.6
0.002	20.2			
		Clay	20.2	23.8

USDA Classification
LOAM

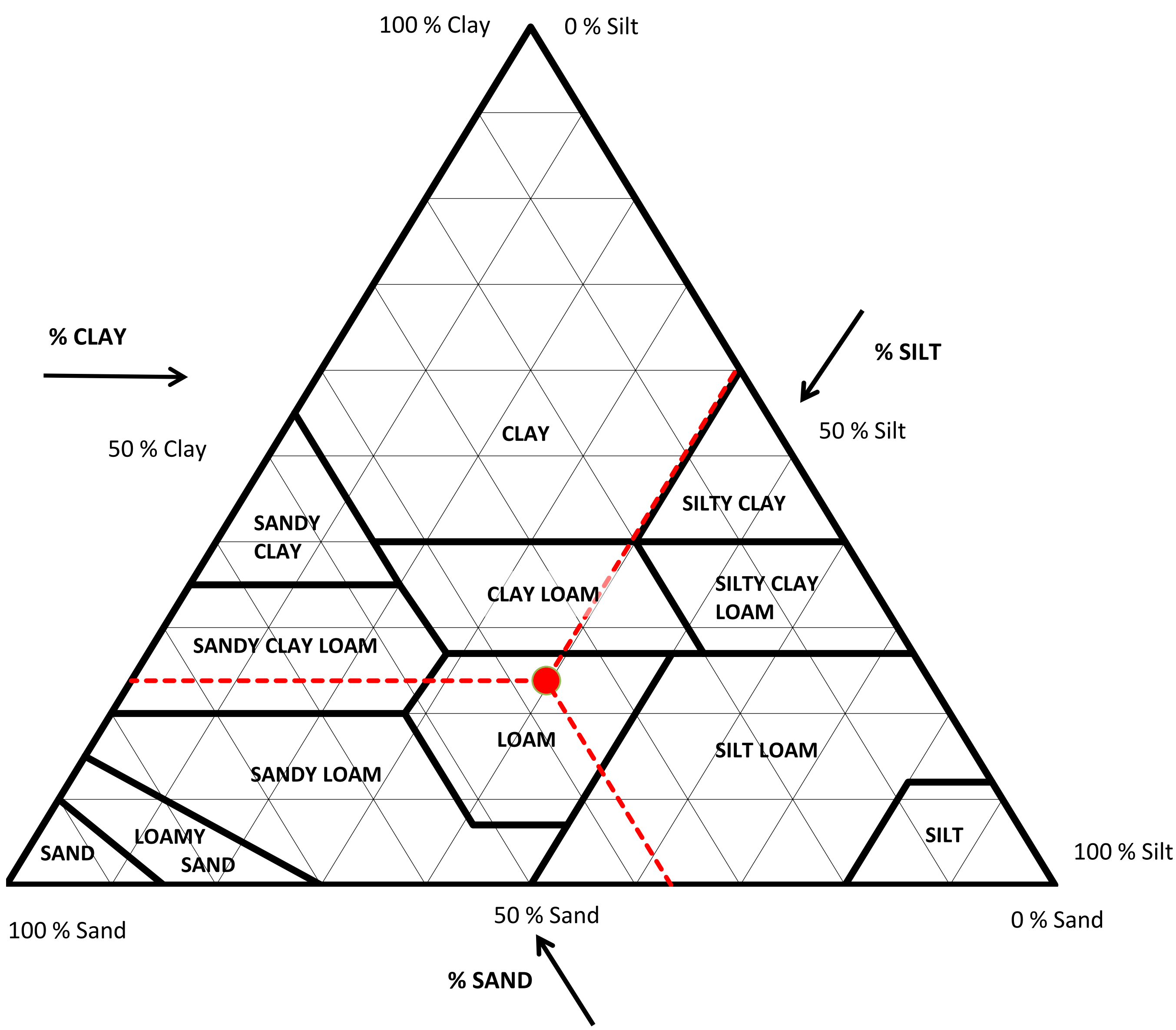
USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-14
Client Project	174-960.001I - PWSA Four Mile Run	Depth	10.0' - 12.0'
Project No.	42276	Sample	Shelby Tube
		Lab Sample	42276004

Sample Color: **BROWN**
USCS Group Name: **SANDY LEAN CLAY**
USCS Group Symbol: **CL** USDA: **LOAM** AASHTO: **A-7-6 (11)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	36.6
Percent Silt, %	39.6
Percent Clay, %	23.8

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	5.8
Coarse Sand; 1-0.5	6.4
Medium Sand; 0.5-0.25	7.7
Fine Sand; 0.25-0.1	9.0
Very Fine Sand; 0.1-0.05	7.6
Total	**36.6**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506001

Sample Color: **VERY DARK GRAYISH BROWN**
USCS Group Name: **SANDY ELASTIC SILT WITH GRAVEL**
USCS Group Symbol: **MH** USDA: **LOAM** AASHTO: **A-7-5 (11)**

MECHANICAL SIEVE

Total Sample		**Sieve Size**	**Nominal Opening, mm**	**Dry Wt, gm**	**Split Normalized % Retained**	**% Finer**	**Project Specifications**
Total Sample Wet Wt, gm (-3")	218	3"	75	0	0.0%	100.0%	
Sample Split on Sieve	No. 4	2-1/2"	63	0	0.0%	100.0%	
Coarse Washed Dry Sample, gm	27	2"	50	0	0.0%	100.0%	
Wet Wt Passing Split, gm	191	1-1/2"	37.5	0	0.0%	100.0%	
Dry Wt. Passing Split, gm	137	1"	25	14.64	8.9%	91.1%	
Total Sample Dry Wt, gm	165	3/4"	19	0	0.0%	91.1%	
Split Sample - Passing No. 4		1/2"	12.5	2.85	1.7%	89.4%	
Tare No.	2001	3/8"	9.5	3.3	2.0%	87.4%	
Tare + WS., gm	301.67	No. 4	4.75	6.56	4.0%	83.4%	
Tare + DS., gm	260.46	No. 10	2	5.69	4.5%	78.9%	
Tare, gm	154.98	No. 20	0.85	8.56	6.8%	72.1%	
Water Content of Split Sample	**39.1%**	No. 40	0.425	7.44	5.9%	66.2%	
Wt. of DS., gm	105.48	No. 60	0.25	5.95	4.7%	61.5%	
		No. 140	0.106	8.63	6.8%	54.7%	
Wt. of +#200 Sample, gm	38.59	No. 200	0.075	2.32	1.8%	52.9%	

HYDROMETER (-#200)

Tare No.	883	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	217.25	Wt. Dry Soil, gm (*-#200*)	23.82		Assumed
Wt. Tare, gm	188.43	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	**R Measured**	**Temp *C**	**Composite Correction**	**R Corrected**	**K Factor**	**Percent Finer (%)**	**Particle Diameter (mm)**	**Adjusted % Finer (%)**
2	26	22.8	5.3	20.7	0.0130	85.9	0.0318	45.4%
5	25	22.5	5.3	19.7	0.0131	81.8	0.0204	43.2%
15	22.5	22.9	5.2	17.3	0.0130	71.8	0.0119	38.0%
30	20.5	23	5.2	15.3	0.0130	63.5	0.0085	33.6%
60	18	23.3	5.1	12.9	0.0129	53.6	0.0061	28.3%
250	13	23.8	5.0	8.0	0.0129	33.2	0.0031	17.6%
1440	10	22.1	5.4	4.6	0.0131	19.1	0.0013	10.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**16.6**	Silt=27.7% Clay=25.2%	
Coarse=8.9; Fine=7.7		D60, mm	NA
% Sand (-#4 & +#200)	**30.5**	D30, mm	NA
Coarse=4.5; Medium=12.6; Fine=13.4		D10, mm	NA
% Fines (-#200)	**52.9**	Cc	NA
% Plus #200 (-3")	**47.1**	Cu	NA

USCS Description
SANDY ELASTIC SILT WITH GRAVEL

USCS Group Symbol	**Atterberg Limits Group Symbol**
MH	**MH - ELASTIC SILT**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100	Gravel	21.1	0
2	78.9	Sand	29.5	37.4
0.05	49.4	Silt	35.6	45.1
0.002	13.8	Clay	13.8	17.5

USDA Classification
LOAM

Performed By: VA/AMP Input Validation: BLS Reviewed By: ALO Date Tested: 10/14/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506001

Soil Description: VERY DARK GRAYISH BROWN ELASTIC SILT
(-#40 Fraction)

AS-RECEIVED W.C.

Tare Number	2001
Wt. Tare & WS, gm	301.67
Wt. Tare & DS, gm	260.46
Wt. Tare, gm	154.98
Water Content, %	39.1

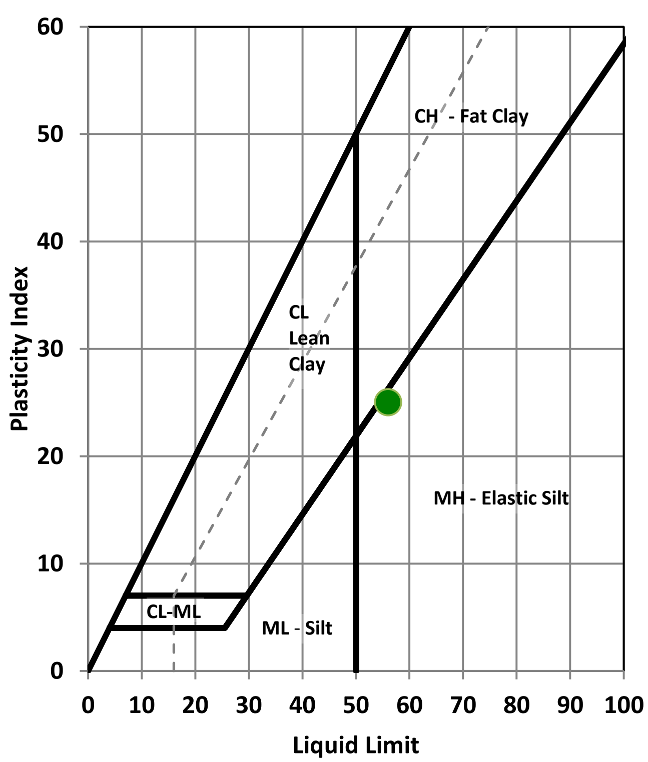
SAMPLE SUMMARY

Liquid Limit (LL), %	**56**
Plastic Limit (PL), %	**31**
Plasticity Index (PI)	**25**
USCS Group Symbol (*-#40 Fraction*)	**MH**
USCS Group Name (*-#40 Fraction*)	**ELASTIC SILT**
Sample Color:	**VERY DARK GRAYISH BROWN**

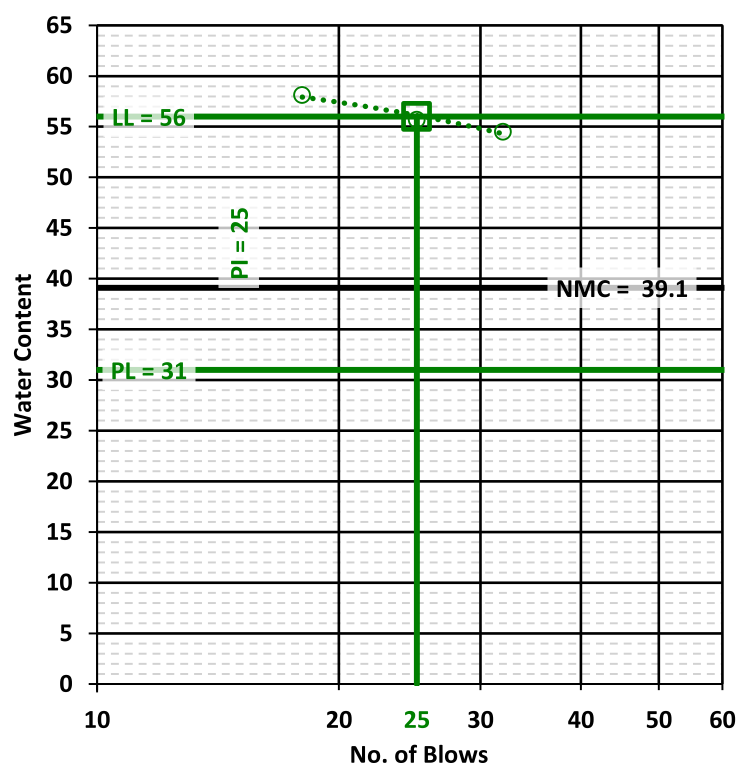
PLASTIC LIMIT / *LIQUID LIMIT*

	Plastic Limit			Liquid Limit		
Points Run	3 Points			3 Points		
Tare Number	329	325	318	348	466	342
Wt. Tare & WS, gm	18.29	17.98	17.53	18.72	17.03	17.88
Wt. Tare & DS, gm	16.72	16.41	16.14	15.86	14.78	15.52
Wt. Tare, gm	11.50	11.46	11.50	10.94	10.74	11.19
Water Content, %	30.1	31.7	30.0	58.1	55.7	54.5
# of Blows				18	25	32

PLASTICITY CHART



FLOW CURVE



Performed By: ZH Input Validation: BLS Reviewed By: ALO Date Tested: 10/14/2019

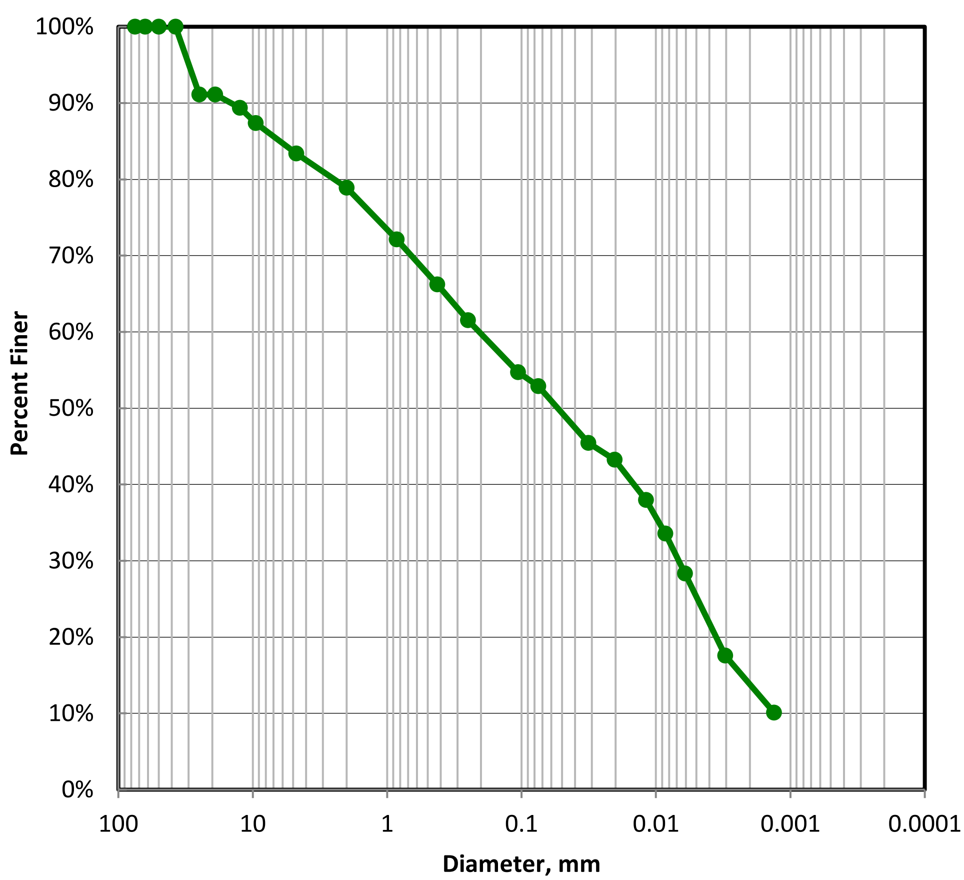
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506001

Sample Color: **VERY DARK GRAYISH BROWN**

USCS Group Name: **SANDY ELASTIC SILT WITH GRAVEL**

USCS Group Symbol: **MH** USDA: **LOAM** AASHTO: **A-7-5 (11)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	91.1%
3/4"	19	91.1%
1/2"	12.5	89.4%
3/8"	9.5	87.4%
No. 4	4.75	83.4%
No. 10	2	78.9%
No. 20	0.85	72.1%
No. 40	0.425	66.2%
No. 60	0.25	61.5%
No. 140	0.106	54.7%
No. 200	0.075	52.9%
NA	0.0318	45.4%
NA	0.0204	43.2%
NA	0.0119	38.0%
NA	0.0085	33.6%
NA	0.0061	28.3%
NA	0.0031	17.6%
NA	0.0013	10.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**16.6**	Silt=27.7% Clay=25.2%	
Coarse=8.9; Fine=7.7		D60, mm	NA
% Sand (-#4 & +#200)	**30.5**	D30, mm	NA
Coarse=4.5; Medium=12.6; Fine=13.4		D10, mm	NA
% Fines (-#200)	**52.9**	Cc	NA
% Plus #200 (-3")	**47.1**	Cu	NA

USCS Description

SANDY ELASTIC SILT WITH GRAVEL

USCS Group Symbol	Atterberg Limits Group Symbol
MH	**MH - ELASTIC SILT**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	21.1	0
2	78.9			
		Sand	29.5	37.4
0.05	49.4			
		Silt	35.6	45.1
0.002	13.8			
		Clay	13.8	17.5

USDA Classification

LOAM

USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506001

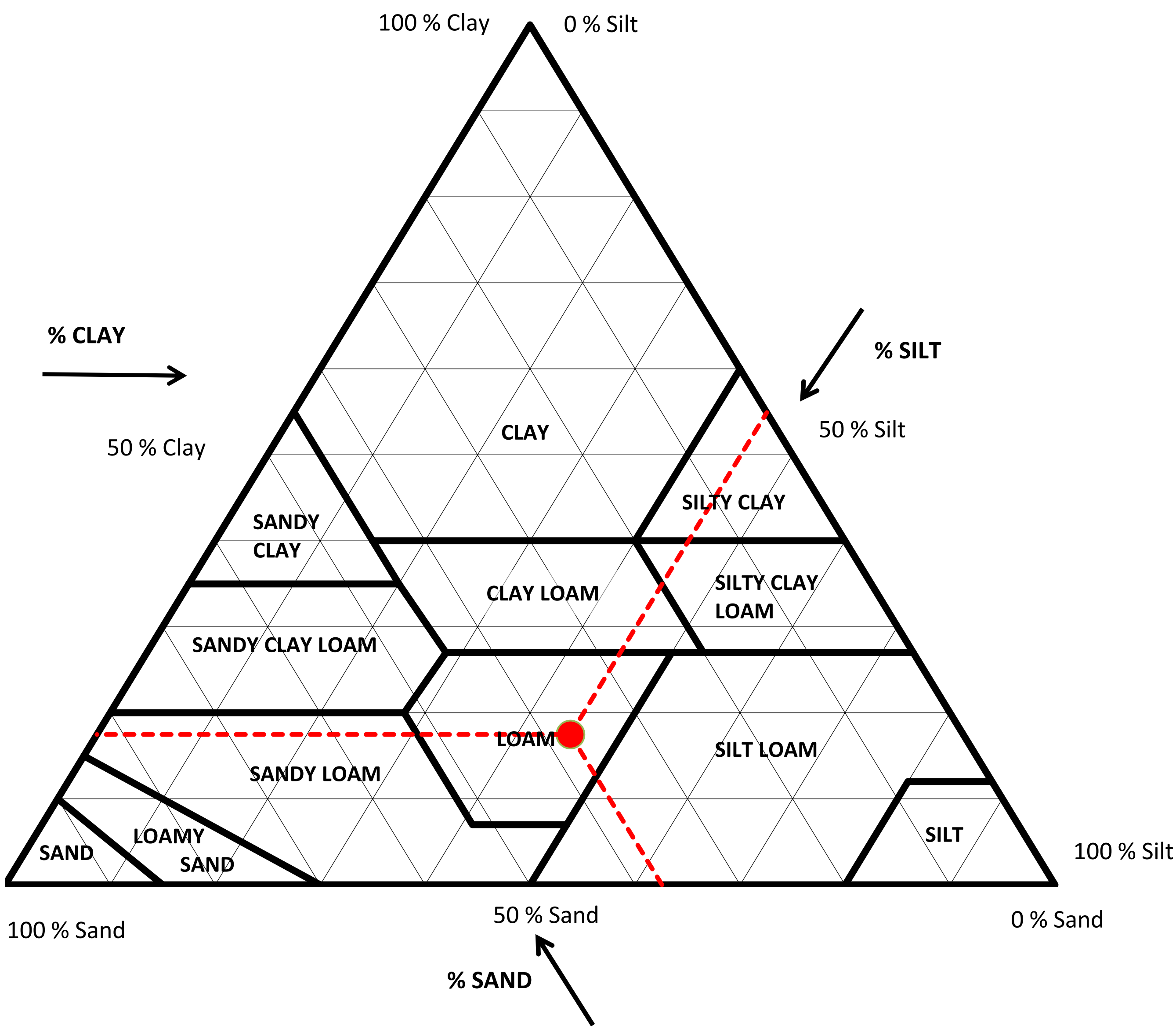
Sample Color: **VERY DARK GRAYISH BROWN**

USCS Group Name: **SANDY ELASTIC SILT WITH GRAVEL**

USCS Group Symbol: **MH** USDA: **LOAM** AASHTO: **A-7-5 (11)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	37.4
Percent Silt, %	45.1
Percent Clay, %	17.5

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	6.9
Coarse Sand; 1-0.5	7.3
Medium Sand; 0.5-0.25	7.7
Fine Sand; 0.25-0.1	9.0
Very Fine Sand; 0.1-0.05	6.4
Total	**37.4**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506	Sample	ST-2
		Lab Sample	42506002

Sample Color: **VERY DARK BROWN**
USCS Group Name: **SILTY SAND**
USCS Group Symbol: **SM** USDA: **SANDY LOAM** AASHTO: **A-2-4 (0)**

MECHANICAL SIEVE

Total Sample		Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
Total Sample Wet Wt, gm (-3")	335	3"	75	0	0.0%	100.0%	
Sample Split on Sieve	No. 4	2-1/2"	63	0	0.0%	100.0%	
Coarse Washed Dry Sample, gm	23	2"	50	0	0.0%	100.0%	
Wet Wt Passing Split, gm	312	1-1/2"	37.5	0	0.0%	100.0%	
Dry Wt. Passing Split, gm	217	1"	25	0	0.0%	100.0%	
Total Sample Dry Wt, gm	240	3/4"	19	5.68	2.4%	97.6%	
Split Sample - Passing No. 4		1/2"	12.5	2.97	1.2%	96.4%	
Tare No.	2056	3/8"	9.5	1.5	0.6%	95.8%	
Tare + WS., gm	400.55	No. 4	4.75	12.86	5.4%	90.4%	
Tare + DS., gm	324.7	No. 10	2	14.34	7.5%	82.9%	
Tare, gm	152.31	No. 20	0.85	18.17	9.5%	73.4%	
Water Content of Split Sample	**44.0%**	No. 40	0.425	23.01	12.1%	61.3%	
Wt. of DS., gm	172.39	No. 60	0.25	21.56	11.3%	50.0%	
		No. 140	0.106	28.41	14.9%	35.1%	
Wt. of +#200 Sample, gm	115.69	No. 200	0.075	10.2	5.3%	29.7%	

HYDROMETER (-#200)

Tare No.	882	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	207.45	Wt. Dry Soil, gm (*-#200*)	13.26		Assumed
Wt. Tare, gm	189.19	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	14.5	22.8	5.3	9.2	0.0130	68.6	0.0343	20.4%
5	12.5	22.9	5.2	7.3	0.0130	54.4	0.0219	16.2%
15	11	22.9	5.2	5.8	0.0130	43.3	0.0128	12.9%
30	10	23.1	5.2	4.8	0.0130	35.8	0.0090	10.6%
60	9	23.3	5.1	3.9	0.0129	29.1	0.0064	8.6%
250	8	23.9	5.0	3.0	0.0129	22.4	0.0031	6.7%
1440	7	22.2	5.4	1.6	0.0131	11.9	0.0013	3.5%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**9.6**	Silt=21.7% Clay=8%	
Coarse=2.4; Fine=7.2		D60, mm	NA
% Sand (-#4 & +#200)	**60.7**	D30, mm	NA
Coarse=7.5; Medium=21.6; Fine=31.6		D10, mm	NA
% Fines (-#200)	**29.7**	Cc	NA
% Plus #200 (-3")	**70.3**	Cu	NA

USCS Description
SILTY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
SM	NP - NON PLASTIC

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	82.9
0.05	24.9
0.002	5.0

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	17.1	0
Sand	58.0	70.0
Silt	19.9	24.0
Clay	5.0	6.0

USDA Classification
SANDY LOAM

Performed By: VA/AMP Input Validation: BLS Reviewed By: ALO Date Tested: 10/14/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

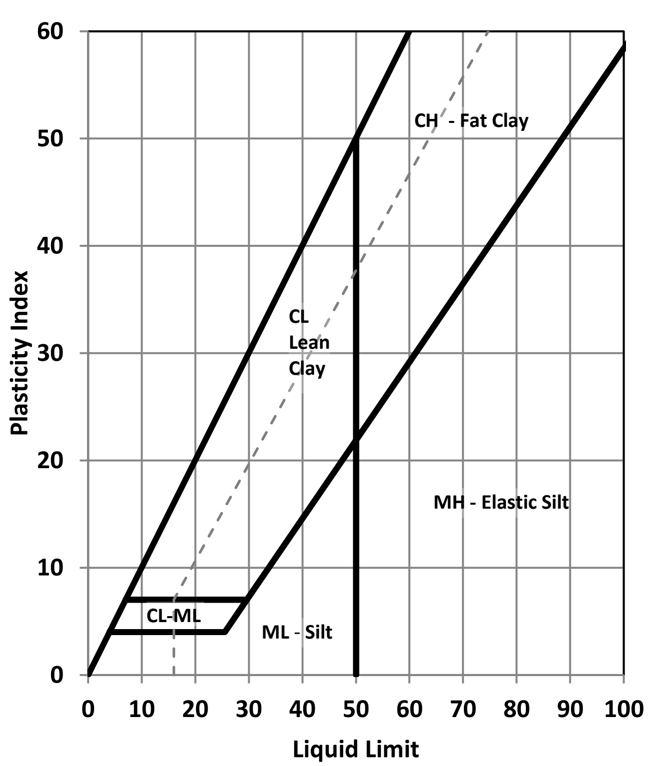
Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506	Sample	ST-2
		Lab Sample	42506002

Soil Description: VERY DARK BROWN NON PLASTIC MATERIAL
(-#40 Fraction)

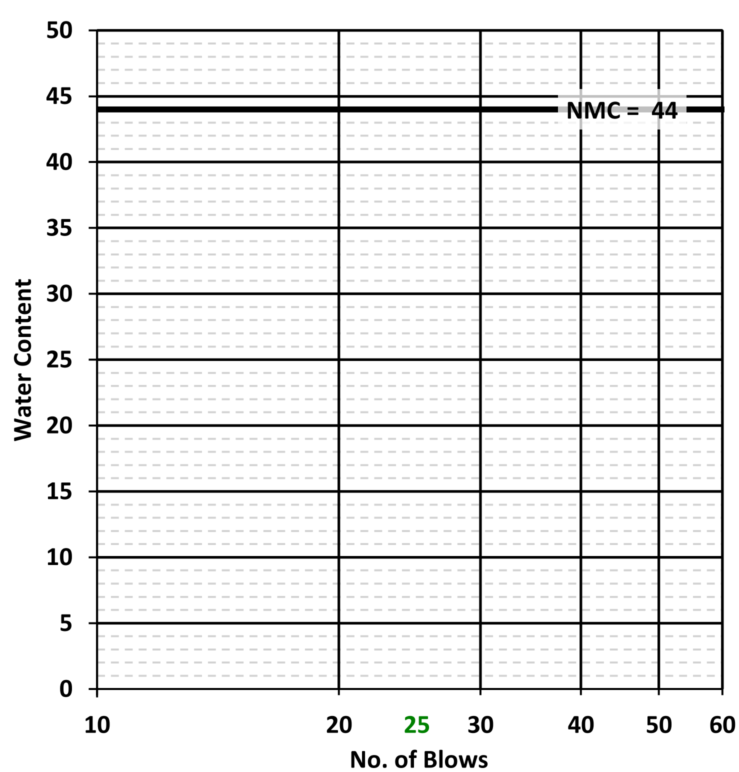
AS-RECEIVED W.C.		*SAMPLE SUMMARY*	
Tare Number	2056	Liquid Limit (LL), %	**NA**
Wt. Tare & WS, gm	400.55	Plastic Limit (PL), %	**NA**
Wt. Tare & DS, gm	324.70	Plasticity Index (PI)	**NA**
Wt. Tare, gm	152.31	USCS Group Symbol (*-#40 Fraction*)	**NP**
Water Content, %	44.0	USCS Group Name (*-#40 Fraction*)	**NON PLASTIC**
		Sample Color:	**VERY DARK BROWN**

PLASTIC LIMIT		*LIQUID LIMIT*
Points Run	0 Non-Plastic	0 Non-Plastic
Tare Number		
Wt. Tare & WS, gm		
Wt. Tare & DS, gm		
Wt. Tare, gm		
Water Content, %		
		# of Blows

PLASTICITY CHART



FLOW CURVE



Performed By: ZH Input Validation: BLS Reviewed By: ALO Date Tested: 10/14/2019

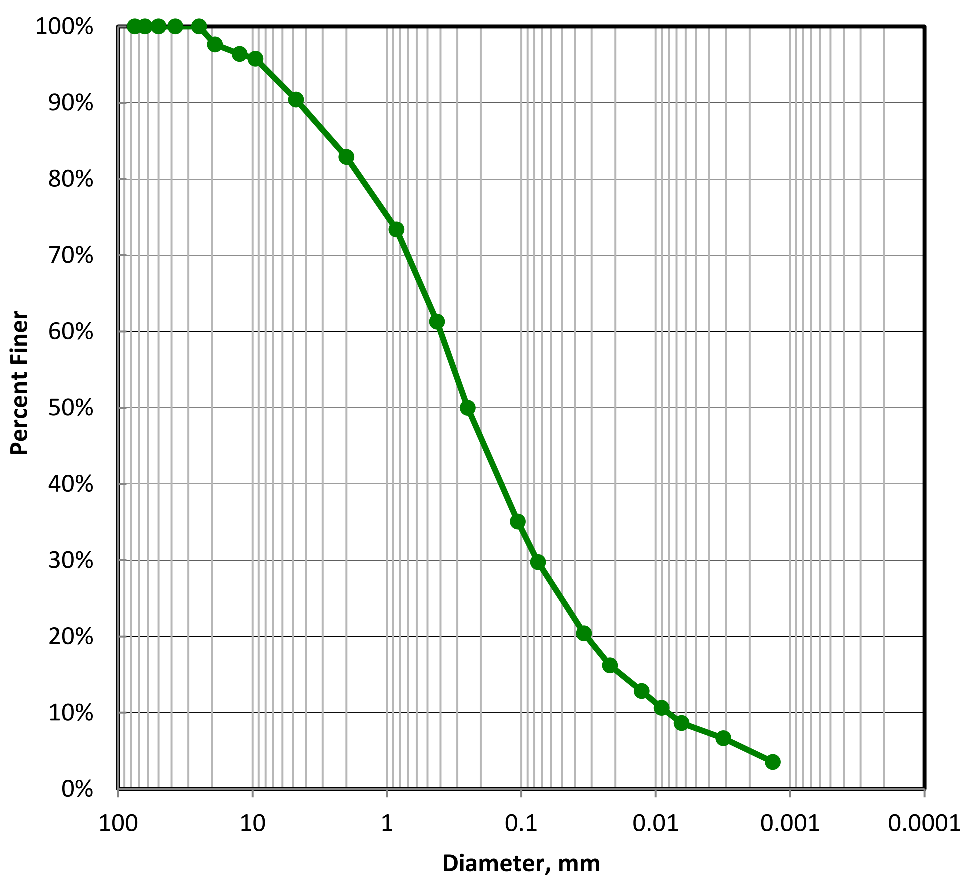
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506	Sample	ST-2
		Lab Sample	42506002

Sample Color: **VERY DARK BROWN**

USCS Group Name: **SILTY SAND**

USCS Group Symbol: **SM** USDA: **SANDY LOAM** AASHTO: **A-2-4 (0)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	97.6%
1/2"	12.5	96.4%
3/8"	9.5	95.8%
No. 4	4.75	90.4%
No. 10	2	82.9%
No. 20	0.85	73.4%
No. 40	0.425	61.3%
No. 60	0.25	50.0%
No. 140	0.106	35.1%
No. 200	0.075	29.7%
NA	0.0343	20.4%
NA	0.0219	16.2%
NA	0.0128	12.9%
NA	0.0090	10.6%
NA	0.0064	8.6%
NA	0.0031	6.7%
NA	0.0013	3.5%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**9.6**	Silt=21.7% Clay=8%	
Coarse=2.4; Fine=7.2		D60, mm	NA
% Sand (-#4 & +#200)	**60.7**	D30, mm	NA
Coarse=7.5; Medium=21.6; Fine=31.6		D10, mm	NA
% Fines (-#200)	**29.7**	Cc	NA
% Plus #200 (-3")	**70.3**	Cu	NA

USCS Description

SILTY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
SM	NP - NON PLASTIC

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	17.1	0
2	82.9			
		Sand	58.0	70.0
0.05	24.9			
		Silt	19.9	24.0
0.002	5.0			
		Clay	5.0	6.0

USDA Classification

SANDY LOAM

USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506	Sample	ST-2
		Lab Sample	42506002

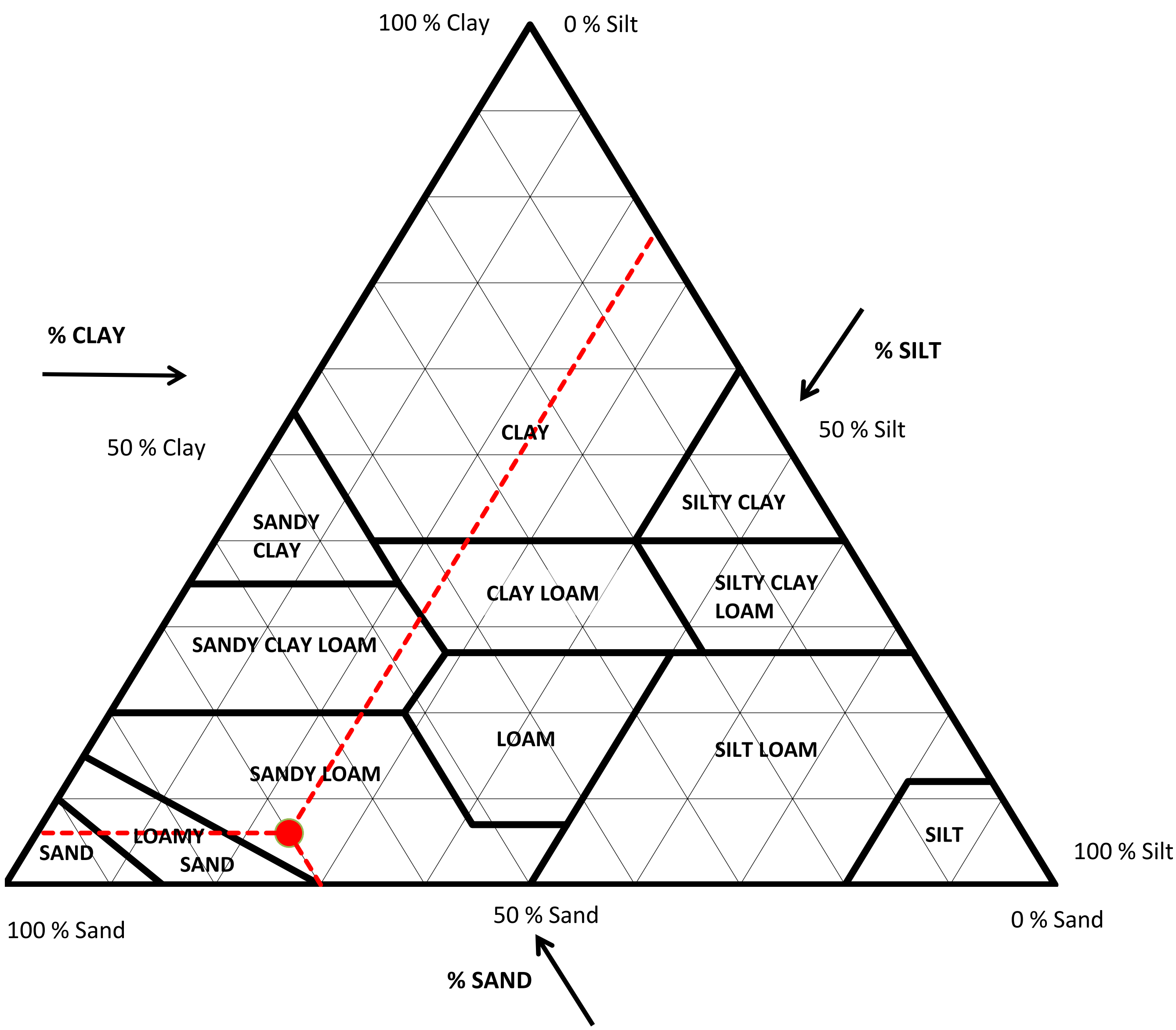
Sample Color: **VERY DARK BROWN**

USCS Group Name: **SILTY SAND**

USCS Group Symbol: **SM** USDA: **SANDY LOAM** AASHTO: **A-2-4 (0)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	70.0
Percent Silt, %	24.0
Percent Clay, %	6.0

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	9.3
Coarse Sand; 1-0.5	13.3
Medium Sand; 0.5-0.25	17.1
Fine Sand; 0.25-0.1	19.1
Very Fine Sand; 0.1-0.05	11.2
Total	**70.0**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	15.0' - 17.0'
Project No.	42506	Sample	ST-3
		Lab Sample	42506003

Sample Color: **BLACK**
USCS Group Name: **SILTY SAND**
USCS Group Symbol: **SM** USDA: **SANDY LOAM** AASHTO: **A-4 (0)**

MECHANICAL SIEVE

Total Sample		Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	% Finer	Project Specifications
Total Sample Wet Wt, gm (-3")	594	3"	75	0	0.0%	100.0%	
Sample Split on Sieve	No. 4	2-1/2"	63	0	0.0%	100.0%	
Coarse Washed Dry Sample, gm	25	2"	50	0	0.0%	100.0%	
Wet Wt Passing Split, gm	570	1-1/2"	37.5	0	0.0%	100.0%	
Dry Wt. Passing Split, gm	413	1"	25	0	0.0%	100.0%	
Total Sample Dry Wt, gm	438	3/4"	19	0	0.0%	100.0%	
Split Sample - Passing No. 4		1/2"	12.5	4.25	1.0%	99.0%	
Tare No.	135	3/8"	9.5	1.77	0.4%	98.6%	
Tare + WS., gm	392.85	No. 4	4.75	18.51	4.2%	94.4%	
Tare + DS., gm	325.21	No. 10	2	10.89	5.8%	88.6%	
Tare, gm	146.88	No. 20	0.85	18.35	9.7%	78.9%	
Water Content of Split Sample	**37.9%**	No. 40	0.425	21.49	11.4%	67.5%	
Wt. of DS., gm	178.33	No. 60	0.25	21.34	11.3%	56.2%	
		No. 140	0.106	26.68	14.1%	42.1%	
Wt. of +#200 Sample, gm	108.33	No. 200	0.075	9.58	5.1%	37.1%	

HYDROMETER (-#200)

Tare No.	760	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	200.78	Wt. Dry Soil, gm (*-#200*)	15.24		Assumed
Wt. Tare, gm	180.54	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	16	22.2	5.4	10.6	0.0131	68.8	0.0342	25.5%
5	13.5	22.2	5.4	8.1	0.0131	52.6	0.0220	19.5%
15	12	22.2	5.4	6.6	0.0131	42.8	0.0128	15.9%
30	10.5	22.3	5.4	5.1	0.0131	33.1	0.0091	12.3%
60	9	22.3	5.4	3.6	0.0131	23.4	0.0065	8.7%
250	7.5	21.8	5.5	2.0	0.0132	13.0	0.0032	4.8%
1440	7	21.4	5.6	1.4	0.0133	9.1	0.0014	3.4%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**5.6**	Silt=29.9% Clay=7.2%	
Coarse=0; Fine=5.6		D60, mm	NA
% Sand (-#4 & +#200)	**57.3**	D30, mm	NA
Coarse=5.8; Medium=21.1; Fine=30.5		D10, mm	NA
% Fines (-#200)	**37.1**	Cc	NA
% Plus #200 (-3")	**62.9**	Cu	NA

USCS Description
SILTY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
SM	NP - NON PLASTIC

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	88.6
0.05	31.1
0.002	4.0

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	11.4	0
Sand	57.6	64.9
Silt	27.1	30.5
Clay	4.0	4.5

USDA Classification
SANDY LOAM

Performed By: VA/AMP Input Validation: bls Reviewed By: ALO Date Tested: 10/15/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

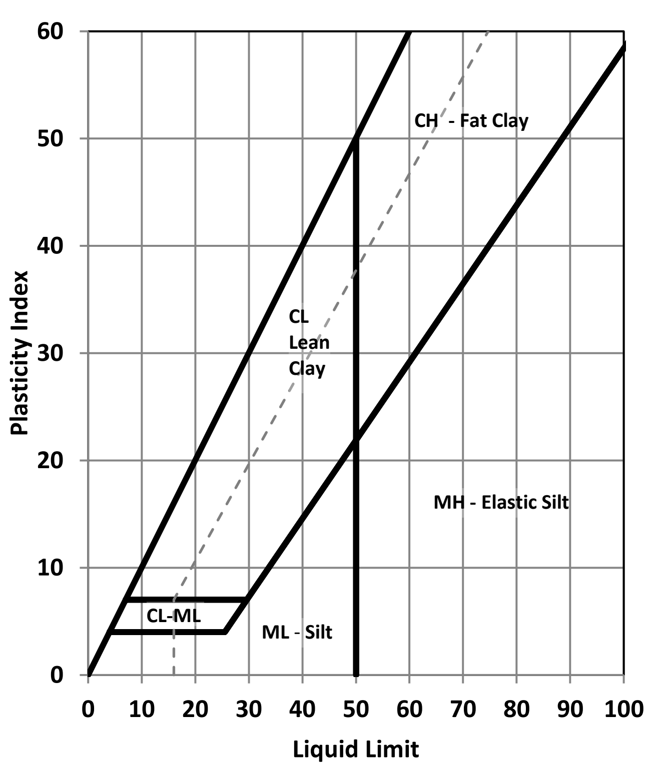
Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	15.0' - 17.0'
Project No.	42506	Sample	ST-3
		Lab Sample	42506003

Soil Description: BLACK NON PLASTIC MATERIAL
(-#40 Fraction)

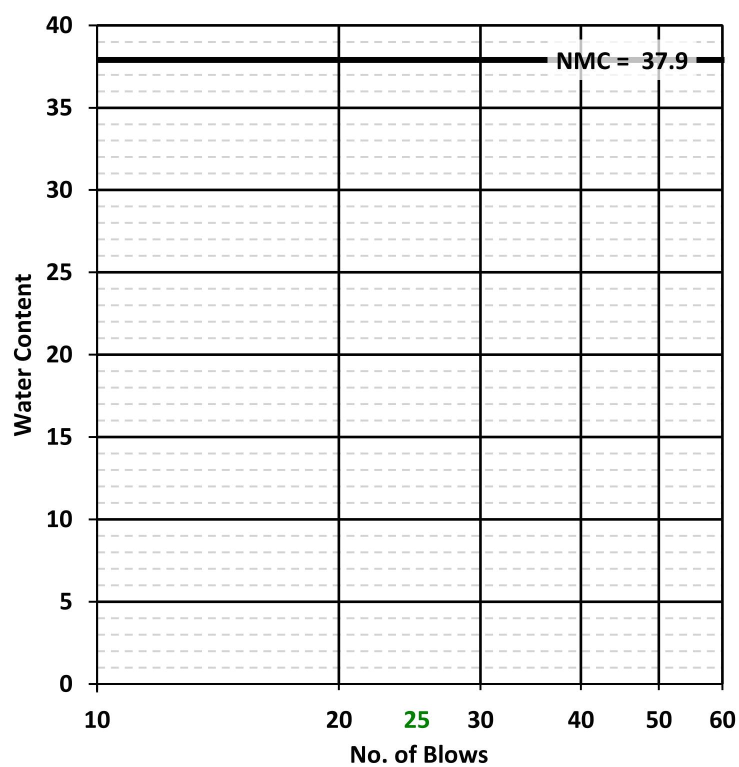
AS-RECEIVED W.C.		SAMPLE SUMMARY	
Tare Number	135	Liquid Limit (LL), %	NA
Wt. Tare & WS, gm	392.85	Plastic Limit (PL), %	NA
Wt. Tare & DS, gm	325.21	Plasticity Index (PI)	NA
Wt. Tare, gm	146.88	USCS Group Symbol (*-#40 Fraction*)	NP
Water Content, %	37.9	USCS Group Name (*-#40 Fraction*)	NON PLASTIC
		Sample Color:	BLACK

PLASTIC LIMIT		LIQUID LIMIT
Points Run	0 Non-Plastic	0 Non-Plastic
Tare Number		
Wt. Tare & WS, gm		
Wt. Tare & DS, gm		
Wt. Tare, gm		
Water Content, %		
		# of Blows

PLASTICITY CHART



FLOW CURVE

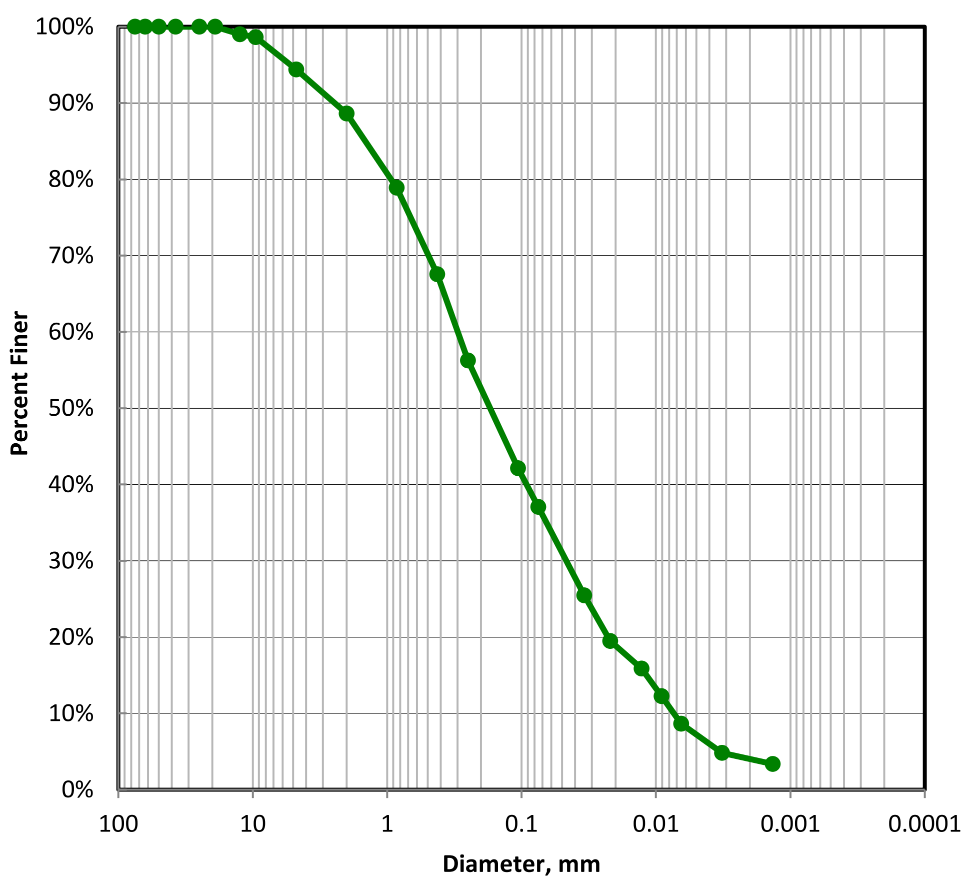


Performed By: ZH   Input Validation: BLS   Reviewed By: ALO   Date Tested: 10/15/2019

PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	15.0' - 17.0'
Project No.	42506	Sample	ST-3
		Lab Sample	42506003

Sample Color: **BLACK**
USCS Group Name: **SILTY SAND**
USCS Group Symbol: **SM** USDA: **SANDY LOAM** AASHTO: **A-4 (0)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	99.0%
3/8"	9.5	98.6%
No. 4	4.75	94.4%
No. 10	2	88.6%
No. 20	0.85	78.9%
No. 40	0.425	67.5%
No. 60	0.25	56.2%
No. 140	0.106	42.1%
No. 200	0.075	37.1%
NA	0.0342	25.5%
NA	0.0220	19.5%
NA	0.0128	15.9%
NA	0.0091	12.3%
NA	0.0065	8.7%
NA	0.0032	4.8%
NA	0.0014	3.4%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**5.6**	Silt=29.9% Clay=7.2%	
Coarse=0; Fine=5.6		D60, mm	NA
% Sand (-#4 & +#200)	**57.3**	D30, mm	NA
Coarse=5.8; Medium=21.1; Fine=30.5		D10, mm	NA
% Fines (-#200)	**37.1**	Cc	NA
% Plus #200 (-3")	**62.9**	Cu	NA

USCS Description
SILTY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
SM	NP - NON PLASTIC

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	11.4	0
2	88.6			
		Sand	57.6	64.9
0.05	31.1			
		Silt	27.1	30.5
0.002	4.0			
		Clay	4.0	4.5

USDA Classification
SANDY LOAM

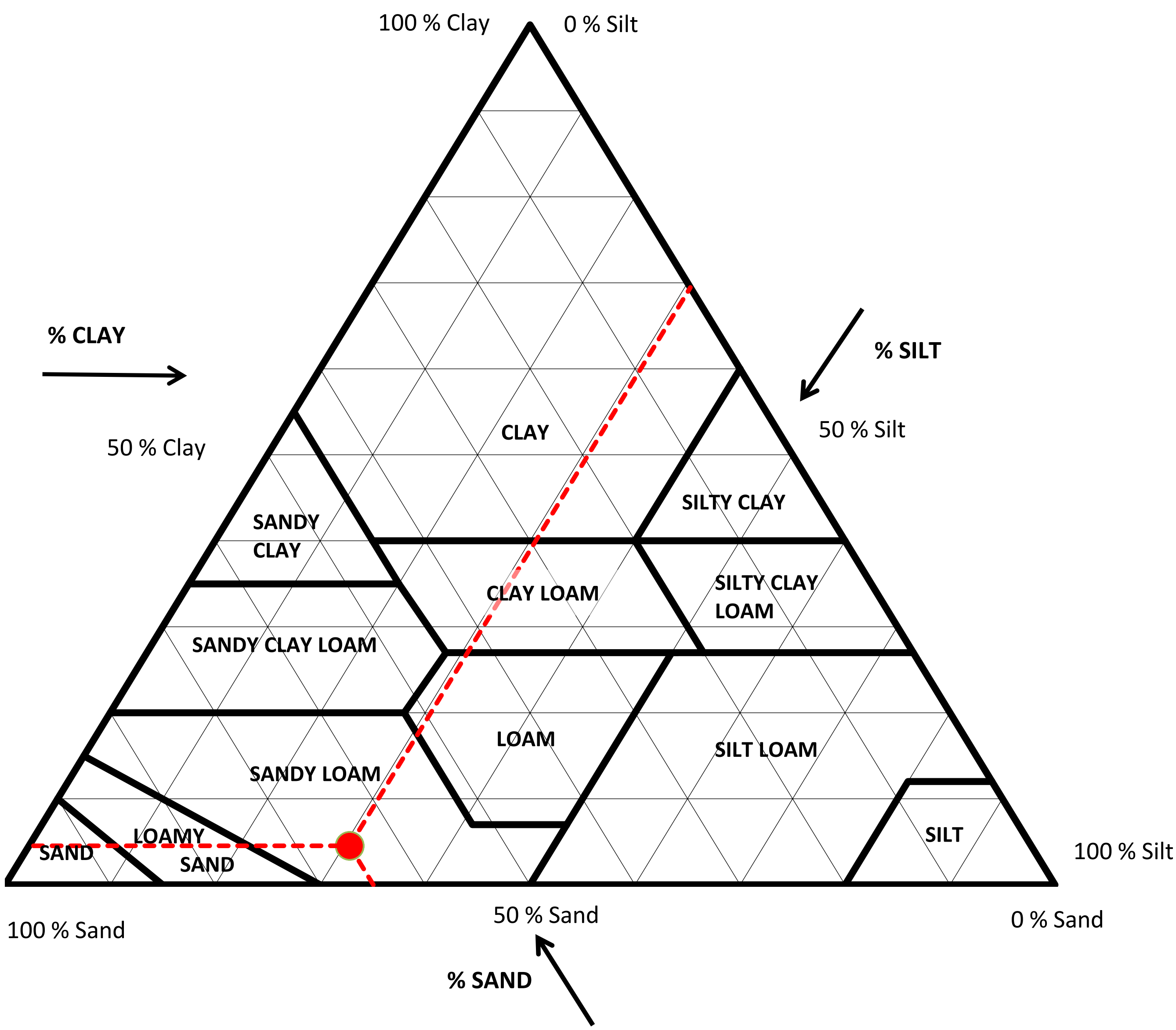
USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	15.0' - 17.0'
Project No.	42506	Sample	ST-3
		Lab Sample	42506003

Sample Color: **BLACK**
USCS Group Name: **SILTY SAND**
USCS Group Symbol: **SM** USDA: **SANDY LOAM** AASHTO: **A-4 (0)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	64.9
Percent Silt, %	30.5
Percent Clay, %	4.5

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	8.9
Coarse Sand; 1-0.5	11.9
Medium Sand; 0.5-0.25	15.8
Fine Sand; 0.25-0.1	16.9
Very Fine Sand; 0.1-0.05	11.5
Total	**64.9**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-30/B-30a
Client Project	174-960 Four Mile Run	Depth	6.0' - 8.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506004

Sample Color: **VERY DARK GRAY**
USCS Group Name: **GRAVELLY LEAN CLAY WITH SAND**
USCS Group Symbol: **CL** USDA: **SILT LOAM** AASHTO: **A-7-6 (8)**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	560
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	122
Wet Wt Passing Split, gm	438
Dry Wt. Passing Split, gm	346
Total Sample Dry Wt, gm	468

Split Sample - Passing No. 4	
Tare No.	2071
Tare + WS., gm	305.46
Tare + DS., gm	272.84
Tare, gm	150.72
Water Content of Split Sample	**26.7%**
Wt. of DS., gm	122.12
Wt. of +#200 Sample, gm	33.23

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	0	0.0%	100.0%	
1/2"	12.5	25.77	5.5%	94.5%	
3/8"	9.5	34.87	7.5%	87.0%	
No. 4	4.75	61.33	13.1%	73.9%	
No. 10	2	7.22	4.4%	69.6%	
No. 20	0.85	5.86	3.5%	66.0%	
No. 40	0.425	5.03	3.0%	63.0%	
No. 60	0.25	5.02	3.0%	59.9%	
No. 140	0.106	7.31	4.4%	55.5%	
No. 200	0.075	2.79	1.7%	53.8%	

HYDROMETER (-#200)

Tare No.	856	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	216.51	Wt. Dry Soil, gm (*-#200*)	25.66		Assumed
Wt. Tare, gm	185.85	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	26.5	21.8	5.5	21.0	0.0132	80.9	0.0321	43.6%
5	23	21.8	5.5	17.5	0.0132	67.4	0.0208	36.3%
15	21	21.9	5.5	15.5	0.0132	59.7	0.0122	32.1%
30	18.5	22	5.5	13.0	0.0132	50.1	0.0087	27.0%
60	16	22	5.5	10.5	0.0132	40.5	0.0063	21.8%
250	12	21.7	5.6	6.4	0.0132	24.7	0.0032	13.3%
1440	9	21.4	5.6	3.4	0.0133	13.1	0.0013	7.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**26.1**	Silt=34.8% Clay=19%	
Coarse=0; Fine=26.1		D60, mm	NA
% Sand (-#4 & +#200)	**20.1**	D30, mm	NA
Coarse=4.4; Medium=6.6; Fine=9.2		D10, mm	NA
% Fines (-#200)	**53.8**	Cc	NA
% Plus #200 (-3")	**46.2**	Cu	NA

USCS Description
GRAVELLY LEAN CLAY WITH SAND

USCS Group Symbol	Atterberg Limits Group Symbol
CL	**CL - LEAN CLAY**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	69.6
0.05	48.9
0.002	10.0

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	30.4	0
Sand	20.7	29.7
Silt	38.9	56.0
Clay	10.0	14.3

USDA Classification
SILT LOAM

Performed By: VA/AMP Input Validation: bls Reviewed By: ALO Date Tested: 10/15/2019

LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS
ASTM D4318-17e1

Client	Civil & Environmental Consultants, Inc.	Boring	B-30/B-30a
Client Project	174-960 Four Mile Run	Depth	6.0' - 8.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506004

Soil Description: VERY DARK GRAY LEAN CLAY
(-#40 Fraction)

AS-RECEIVED W.C.

Tare Number	2071
Wt. Tare & WS, gm	305.46
Wt. Tare & DS, gm	272.84
Wt. Tare, gm	150.72
Water Content, %	26.7

SAMPLE SUMMARY

Liquid Limit (LL), %	**45**
Plastic Limit (PL), %	**26**
Plasticity Index (PI)	**19**
USCS Group Symbol (*-#40 Fraction*)	**CL**
USCS Group Name (*-#40 Fraction*)	**LEAN CLAY**
Sample Color:	**VERY DARK GRAY**

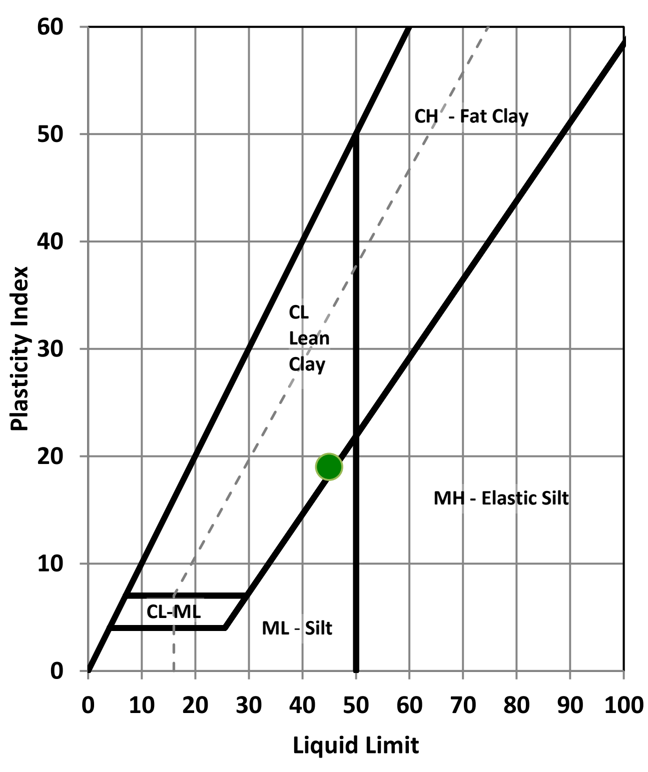
PLASTIC LIMIT

Points Run		3 Points	
Tare Number	410	345	702
Wt. Tare & WS, gm	18.05	17.76	18.89
Wt. Tare & DS, gm	16.55	16.43	17.58
Wt. Tare, gm	10.77	11.37	12.48
Water Content, %	26.0	26.3	25.7

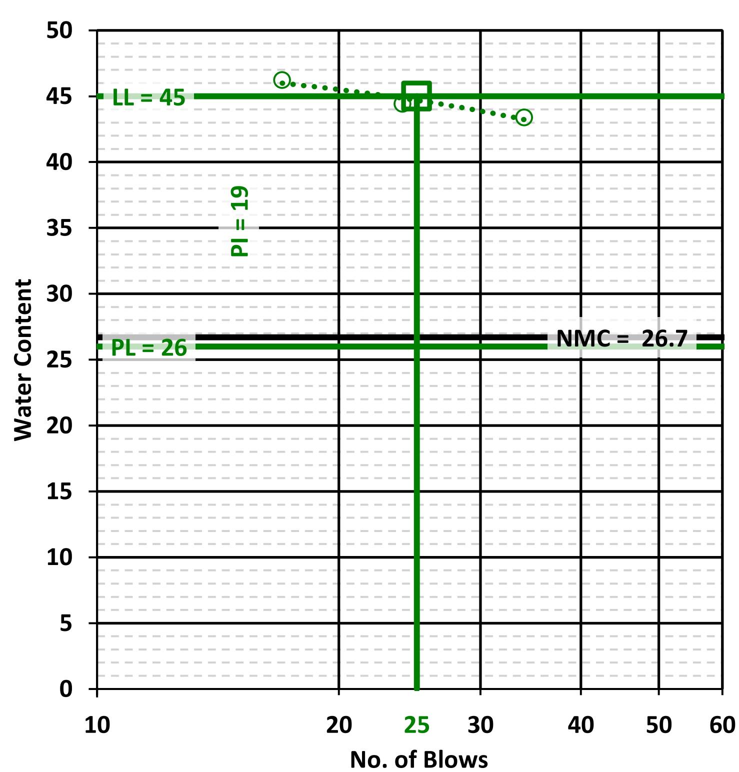
LIQUID LIMIT

		3 Points	
	303	323	308
	19.97	17.75	18.60
	17.27	15.71	16.33
	11.43	11.12	11.10
	46.2	44.4	43.4
# of Blows	17	24	34

PLASTICITY CHART



FLOW CURVE



Performed By: ZH Input Validation: BLS Reviewed By: ALO Date Tested: 10/15/2019

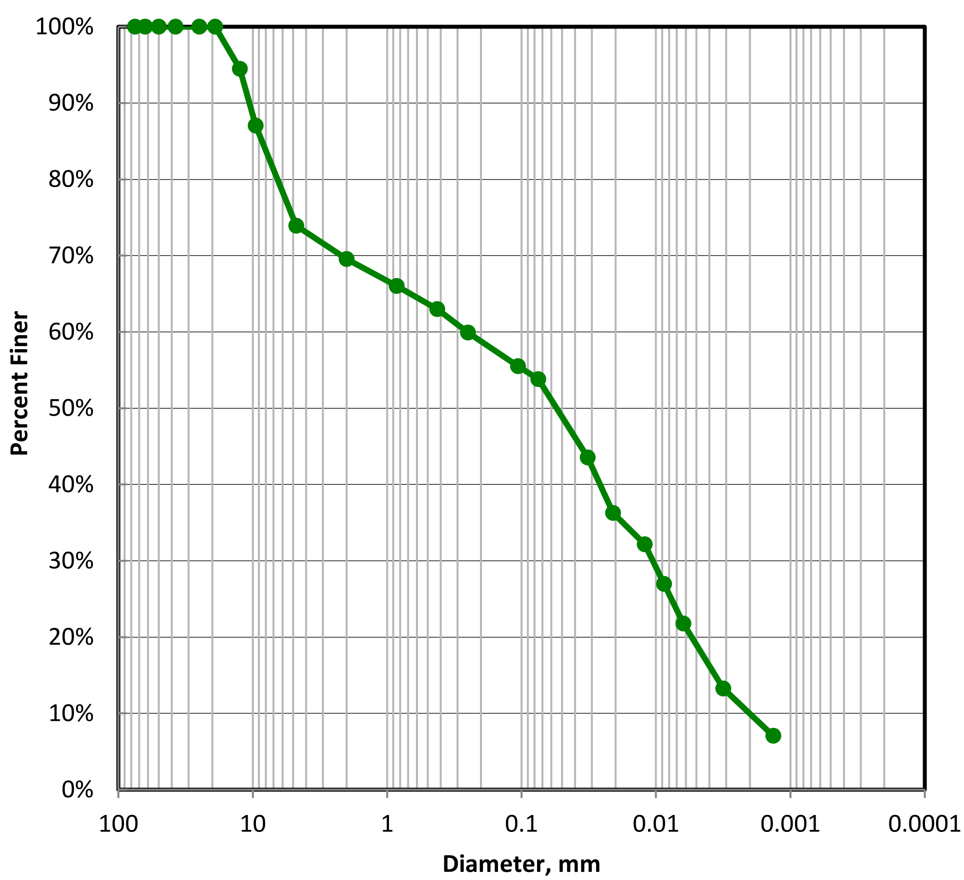
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	Civil & Environmental Consultants, Inc.	Boring	B-30/B-30a
Client Project	174-960 Four Mile Run	Depth	6.0' - 8.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506004

Sample Color: **VERY DARK GRAY**

USCS Group Name: **GRAVELLY LEAN CLAY WITH SAND**

USCS Group Symbol: **CL** USDA: **SILT LOAM** AASHTO: **A-7-6 (8)**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	94.5%
3/8"	9.5	87.0%
No. 4	4.75	73.9%
No. 10	2	69.6%
No. 20	0.85	66.0%
No. 40	0.425	63.0%
No. 60	0.25	59.9%
No. 140	0.106	55.5%
No. 200	0.075	53.8%
NA	0.0321	43.6%
NA	0.0208	36.3%
NA	0.0122	32.1%
NA	0.0087	27.0%
NA	0.0063	21.8%
NA	0.0032	13.3%
NA	0.0013	7.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**26.1**	Silt=34.8% Clay=19%	
Coarse=0; Fine=26.1		D60, mm	NA
% Sand (-#4 & +#200)	**20.1**	D30, mm	NA
Coarse=4.4; Medium=6.6; Fine=9.2		D10, mm	NA
% Fines (-#200)	**53.8**	Cc	NA
% Plus #200 (-3")	**46.2**	Cu	NA

USCS Description

GRAVELLY LEAN CLAY WITH SAND

USCS Group Symbol	Atterberg Limits Group Symbol
CL	CL - LEAN CLAY

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	30.4	0
2	69.6			
		Sand	20.7	29.7
0.05	48.9			
		Silt	38.9	56.0
0.002	10.0			
		Clay	10.0	14.3

USDA Classification

SILT LOAM

USDA CLASSIFICATION CHART

Client	Civil & Environmental Consultants, Inc.	Boring	B-30/B-30a
Client Project	174-960 Four Mile Run	Depth	6.0' - 8.0'
Project No.	42506	Sample	ST-1
		Lab Sample	42506004

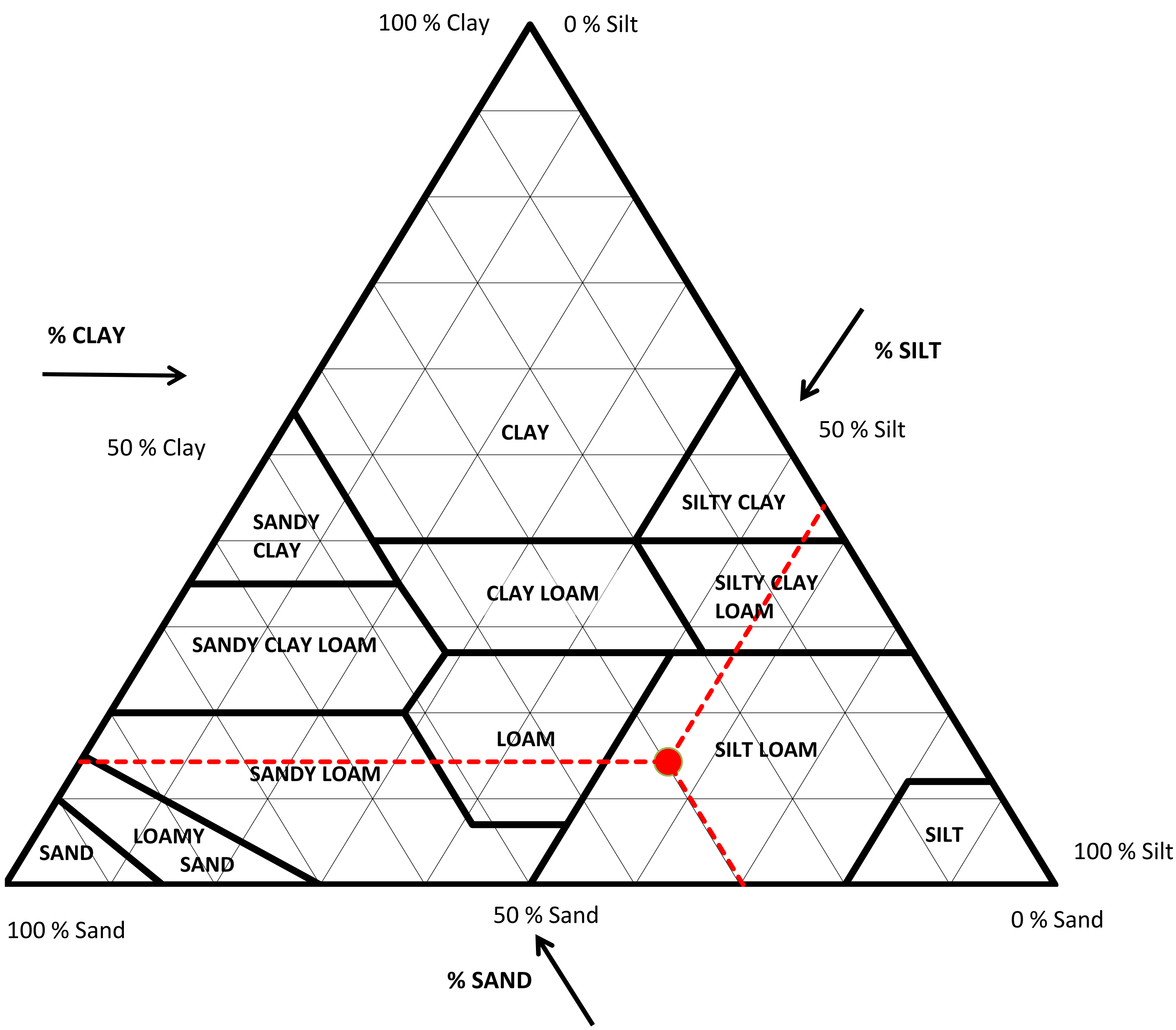
Sample Color: **VERY DARK GRAY**

USCS Group Name: **GRAVELLY LEAN CLAY WITH SAND**

USCS Group Symbol: **CL** USDA: **SILT LOAM** AASHTO: **A-7-6 (8)**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	29.7
Percent Silt, %	56.0
Percent Clay, %	14.3

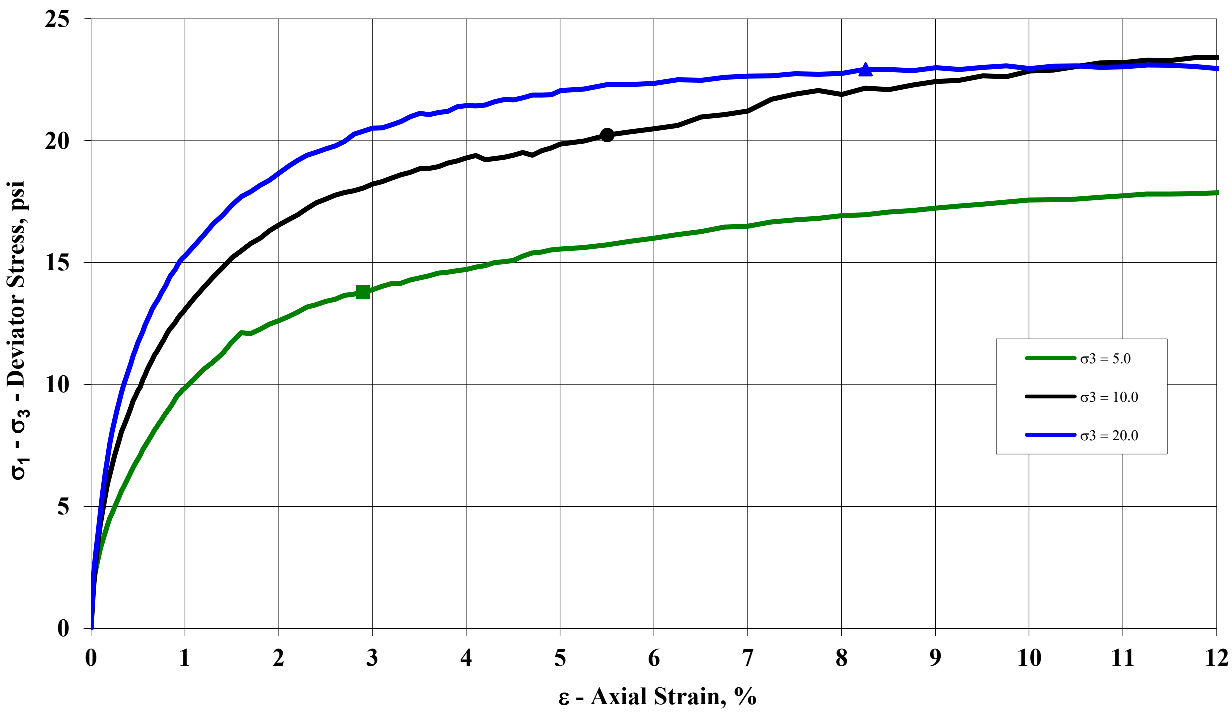
Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	4.1
Coarse Sand; 1-0.5	4.3
Medium Sand; 0.5-0.25	5.4
Fine Sand; 0.25-0.1	6.8
Very Fine Sand; 0.1-0.05	9.1
Total	**29.7**



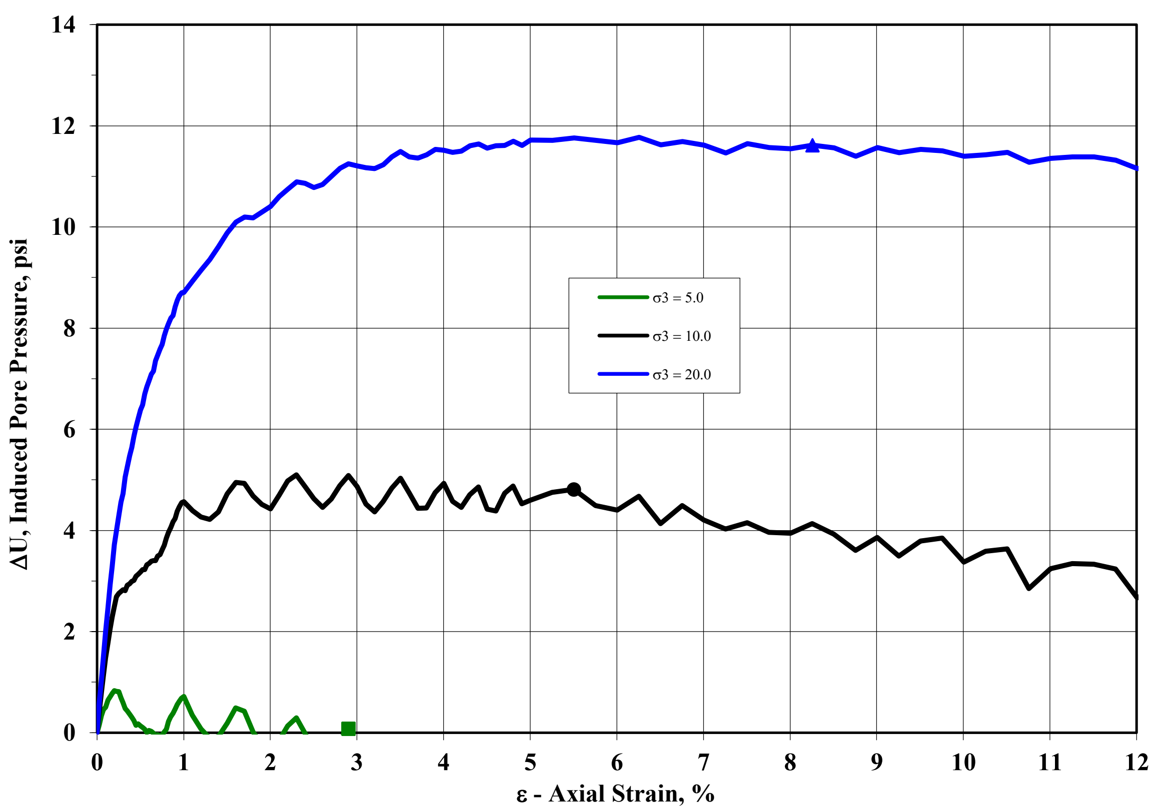
CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
Test Conditions:	Undisturbed - Side And Double Drained	Lab Sample No.	42506001
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL		

AXIAL STRAIN vs. DEVIATOR STRESS



AXIAL STRAIN vs. INDUCED PORE-WATER PRESSURE



CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab Sample No.	42506001
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL		
Test Conditions:	Undisturbed - Side And Double Drained		

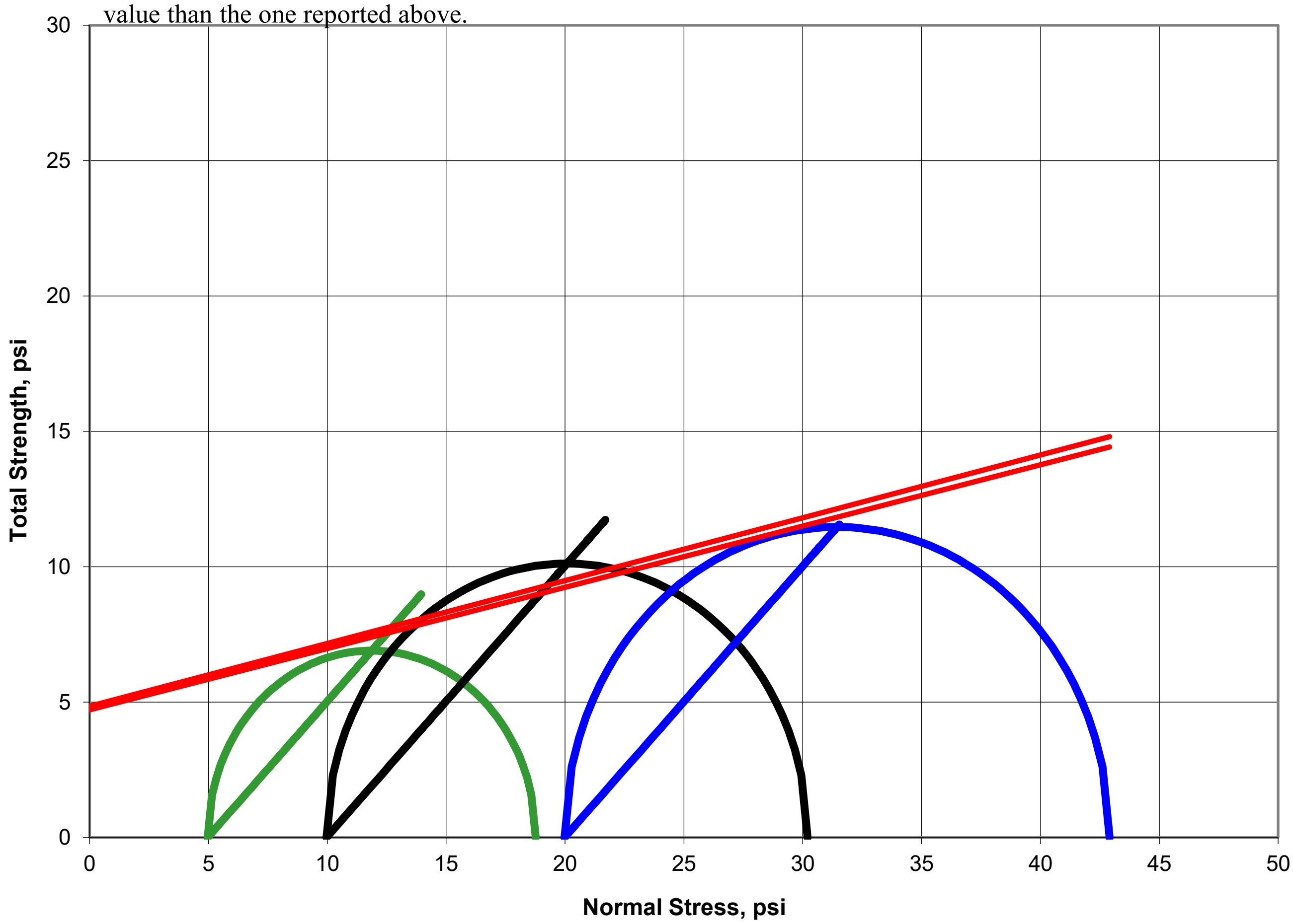
TOTAL STRESS

FAILURE CONDITION: MAX. EFFECTIVE PRINCIPAL STRESS RATIO

Test No.	Deviator Stress	Major Principal Stress	Minor Principal Stress	Strain at Failure	Mohr's Circle Stress Path		Failure Angle	
	$\sigma 1-\sigma 3$	$\sigma 1$	$\sigma 3$	ε	$(\sigma 1+\sigma 3)/2$	$(\sigma 1-\sigma 3)/2$		
	psi	psi	psi	%	psi	psi	α, deg	12.7
Test 1	13.80	18.77	4.97	2.90	11.87	6.90	a, psi	4.7
Test 2	20.24	30.20	9.96	5.50	20.08	10.12	Φ, deg	13.1
Test 3	22.93	42.91	19.98	8.26	31.44	11.47	C, psi	4.8

Calculations based on: Test 1 Test 2 Test 3

Note: The Friction Angle and Cohesion using other combinations of test points may yield a higher or lower value than the one reported above.



CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab Sample No.	42506001

USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL
Test Conditions:	Undisturbed - Side And Double Drained

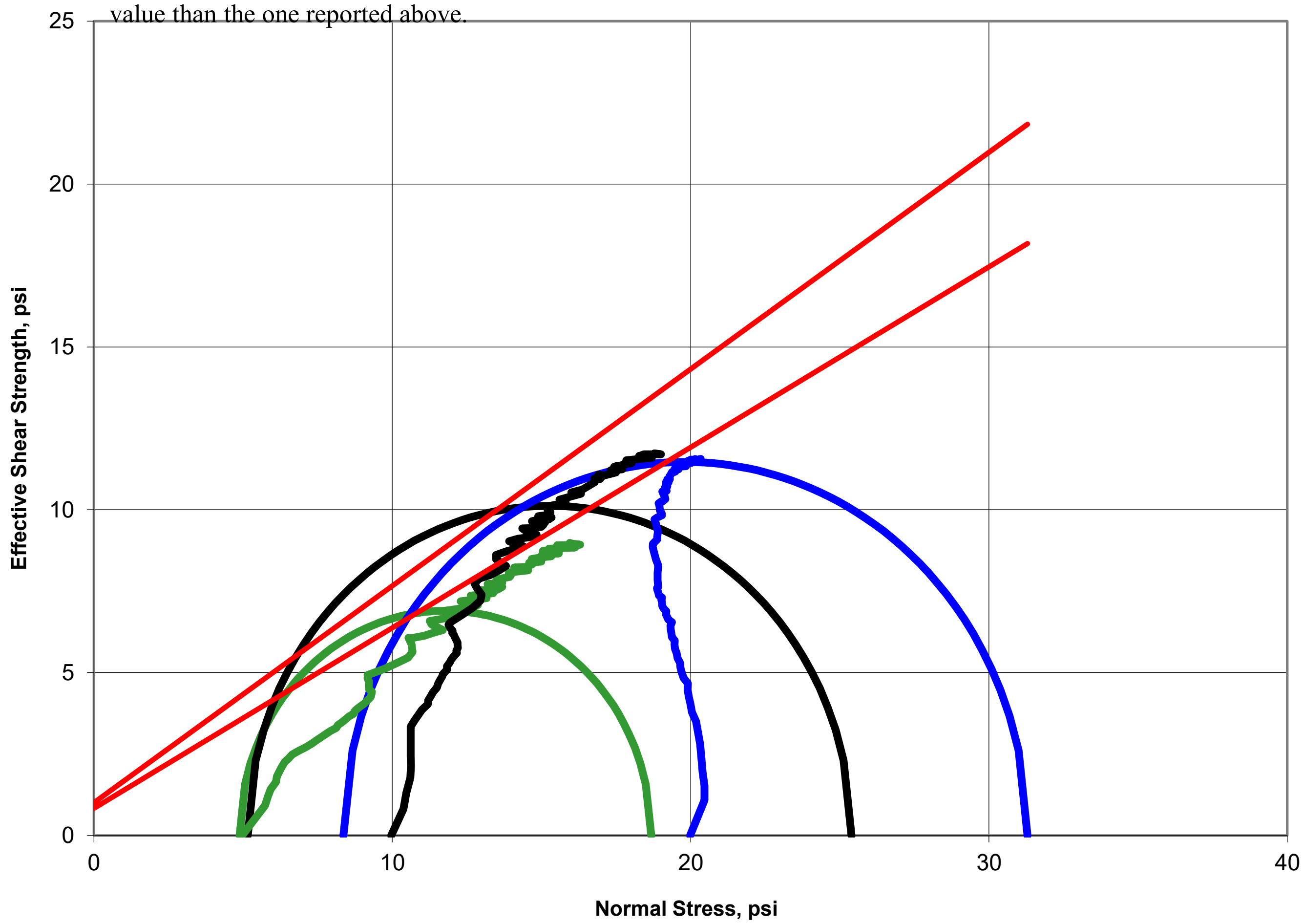
EFFECTIVE STRESS

FAILURE CONDITION: MAX. EFFECTIVE PRINCIPAL STRESS RATIO

Test No.	Deviator Stress	Major Principal Stress	Minor Principal Stress	Strain at Failure	Mohr's Circle Stress Path		Failure Angle	
	$\sigma 1-\sigma 3$	$\sigma '1$	$\sigma '3$	ε	p'	q		
	psi	psi	psi	%	psi	psi	α', deg	29.0
Test 1	13.80	18.68	4.88	2.90	11.78	6.90	a', psi	0.8
Test 2	20.24	25.39	5.15	5.50	15.27	10.12	Φ', deg	33.7
Test 3	22.93	31.29	8.36	8.26	19.83	11.47	C', psi	1.0

Calculations based on: Test 1 Test 2 Test 3

Note: The Friction Angle and Cohesion using other combinations of test points may yield a higher or lower value than the one reported above.



CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
Test No.	1	Lab Sample No.	42506001
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL	Test Conditions:	Undisturbed - Side And Double Drained

SAMPLE CONDITIONS

	Initial	After Consol.	Final
Tare Number	2001	NA	740
Wt. Tare & WS, gm	301.67	NA	1188.06
Wt. Tare & DS, gm	260.46	NA	894.74
Wt. Tare, gm	154.98	NA	187.63
Water Content, %	39.1	41.5	41.5
Wt. Tube & WS., gm	1386.3	NA	
Wt. Of Tube, gm	422.1	NA	
Wt. Of WS., gm	964.2	980.9	
Length 1, in	5.907	NA	
Length 2, in	5.89	NA	
Length 3, in	5.892	NA	
Top Diameter, in	2.849	NA	
Middle Diameter, in	2.862	NA	
Bottom Diameter, in	2.87	NA	
Average Length, in	5.896	5.882	
Average Diameter, in	2.860	2.786	
Average Area, in^2	6.43	6.09	
Sample Volume, in^3	37.89	36.12	
Unit Dry Wt., gms/cc	1.12	1.17	
Unit Dry Wt., pcf	69.7	73.1	
Specific Gravity, Assume	2.70	2.70	
Volume of Solids, cc	256.79		
Void Ratio, e	1.42		
Porosity, n	0.59		
Pore Volume, cc	364.09		
Saturation, %	74.4		

TEST CONDITIONS

Cell Pressure, psi	105.43	
Back Pressure, psi	100.46	
Effective Consolidating Pressure, psi	4.97	σ_3
Pore Pressure Parameter (B), %	1	

SATURATION AND CONSOLIDATION VOLUME CHANGES

Height Change, mils	Reading	Change	Consolidation	
Initial Reading	6.962	0	Volume Change, ml	29.0
After Saturation	6.948	14	Volume Change, in^3	1.77
After Consolidation	6.948	14	Saturation Method:	Wet

STRAIN RATE CALCULATIONS

Calc. Strain Rate, %/min (t50=136.44)	0.00003	Strain Rate Used, %/min	0.00006
Calc. Deformation Rate, in/min	0.00017	Deformation Rate Used	0.00034

EFFECTIVE FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Effective Consolidating Pressure, psi	4.97	NA	σ_3
Maximum Effective Principal Stress Ratio	3.827	NA	σ_1'/σ_3'
Deviator Stress at Failure, psi	13.80	NA	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	2.90	NA	ε
Effective Minor Principal Stress at Failure, psi	4.88	NA	σ_3'
Effective Major Principal Stress at Failure, psi	18.68	NA	σ_1'
Mohr's Circle Stress Path (Origin of Circle), psi	11.78	NA	p'
Mohr's Circle Stress Path (Radius of Circle), psi	6.90	NA	q

TOTAL FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Deviator Stress at Failure, psi	13.80	NA	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	2.90	NA	ε
Total Minor Principal Stress at Failure, psi	4.97	NA	σ_3
Total Major Principal Stress at Failure, psi	18.77	NA	σ_1

TEST DATA

Axial Load	Axial Deformation	Total Pore Water Pressure	Axial Strain	Principal Stress Difference (Deviator Stress)	Induced Pore Water Pressure	Effective Major Principal Stress	Effective Minor Principal Stress	Effective Principal Stress Ratio	A-Bar	Mohr's Circle Stress Paths: Origin of Circle	Mohr's Circle Stress Paths: Radius of Circle
lb.	mils	psi	%	psi	psi	psi	psi			psi	psi
P	ΔH	U	ε	$\sigma_1-\sigma_3$	ΔU	σ_1'	σ_3'	σ_1'/σ_3'	A'	p'	q
19.8	0	100.5	0	0	NA	NA	NA	NA	NA	4.97	0
31.1	1	100.6	0.02	1.85	0.16	6.65	4.81	1.384	9.07	5.73	0.92
34.4	3	100.8	0.05	2.39	0.34	7.02	4.63	1.516	14.78	5.83	1.19
37.1	4	100.9	0.07	2.84	0.46	7.35	4.51	1.631	17.06	5.93	1.42
39.8	6	101.0	0.10	3.28	0.50	7.74	4.46	1.735	16.18	6.10	1.64
41.9	7	101.1	0.12	3.62	0.65	7.94	4.32	1.838	18.77	6.13	1.81
43.8	9	101.2	0.15	3.94	0.71	8.19	4.25	1.926	19.10	6.22	1.97
45.6	10	101.2	0.17	4.23	0.78	8.42	4.19	2.010	19.35	6.30	2.11
47.4	12	101.3	0.20	4.51	0.83	8.65	4.13	2.092	19.41	6.39	2.26
48.7	13	101.3	0.22	4.73	0.82	8.88	4.15	2.140	18.16	6.51	2.37
50.2	15	101.3	0.25	4.98	0.81	9.13	4.16	2.198	17.12	6.65	2.49
51.6	16	101.2	0.27	5.20	0.69	9.47	4.27	2.216	14.05	6.87	2.60
52.8	18	101.1	0.30	5.40	0.59	9.77	4.38	2.233	11.52	7.07	2.70
54.3	19	100.9	0.32	5.64	0.48	10.13	4.49	2.256	8.91	7.31	2.82
55.5	21	100.9	0.35	5.83	0.43	10.36	4.53	2.286	7.79	7.45	2.92
56.7	22	100.8	0.37	6.02	0.36	10.62	4.60	2.309	6.38	7.61	3.01
57.9	24	100.8	0.40	6.22	0.31	10.88	4.66	2.335	5.16	7.77	3.11
59.0	25	100.7	0.43	6.40	0.24	11.13	4.73	2.355	3.94	7.93	3.20
60.2	26	100.6	0.45	6.60	0.15	11.42	4.82	2.369	2.33	8.12	3.30
61.3	28	100.6	0.48	6.78	0.18	11.57	4.79	2.417	2.78	8.18	3.39
62.4	29	100.6	0.50	6.95	0.14	11.79	4.83	2.440	2.05	8.31	3.48
63.5	31	100.6	0.53	7.13	0.11	11.99	4.86	2.466	1.55	8.42	3.56
64.6	32	100.5	0.55	7.31	0.07	12.21	4.89	2.494	1.03	8.55	3.66
65.6	34	100.5	0.58	7.47	0.00	12.44	4.96	2.506	0.03	8.70	3.74
66.6	35	100.5	0.60	7.63	0.05	12.55	4.92	2.552	0.63	8.74	3.82
67.7	37	100.5	0.63	7.80	0.03	12.74	4.94	2.580	0.36	8.84	3.90
68.7	38	100.4	0.65	7.96	-0.01	12.94	4.98	2.601	-0.13	8.96	3.98
69.7	40	100.4	0.68	8.12	-0.05	13.14	5.02	2.619	-0.67	9.08	4.06
70.5	41	100.4	0.70	8.26	-0.04	13.27	5.00	2.651	-0.48	9.13	4.13
71.5	43	100.4	0.73	8.42	-0.07	13.46	5.04	2.672	-0.87	9.25	4.21
72.3	44	100.4	0.75	8.55	-0.04	13.56	5.01	2.707	-0.53	9.28	4.28
73.3	46	100.5	0.78	8.71	0.01	13.66	4.95	2.759	0.16	9.31	4.36
74.1	47	100.5	0.80	8.84	0.07	13.73	4.89	2.806	0.85	9.31	4.42
74.9	49	100.7	0.83	8.97	0.23	13.71	4.74	2.893	2.66	9.23	4.49
75.8	50	100.8	0.85	9.11	0.31	13.77	4.65	2.957	3.59	9.21	4.56
76.8	51	100.8	0.88	9.27	0.39	13.84	4.58	3.024	4.39	9.21	4.63

77.9	53	100.9	0.90	9.44	0.47	13.94	4.50	3.099	5.20	9.22	4.72
78.7	54	101.0	0.93	9.57	0.55	13.98	4.41	3.169	6.10	9.20	4.78
79.2	56	101.1	0.95	9.66	0.62	14.00	4.34	3.225	6.81	9.17	4.83
80.0	57	101.1	0.98	9.78	0.68	14.07	4.28	3.283	7.33	9.18	4.89
80.5	59	101.2	1.00	9.86	0.72	14.10	4.25	3.321	7.69	9.17	4.93
82.9	65	100.8	1.10	10.23	0.35	14.85	4.62	3.217	3.60	9.73	5.12
85.4	71	100.5	1.20	10.63	0.08	15.52	4.89	3.174	0.75	10.20	5.31
87.2	76	100.4	1.30	10.92	-0.11	15.99	5.07	3.152	-1.04	10.53	5.46
89.5	82	100.4	1.40	11.27	-0.07	16.31	5.04	3.237	-0.68	10.68	5.64
92.5	88	100.6	1.50	11.74	0.19	16.52	4.78	3.457	1.67	10.65	5.87
95.0	94	100.9	1.60	12.13	0.49	16.61	4.48	3.711	4.25	10.54	6.07
94.8	100	100.9	1.70	12.10	0.43	16.64	4.54	3.665	3.70	10.59	6.05
95.9	106	100.5	1.80	12.26	0.02	17.21	4.95	3.477	0.13	11.08	6.13
97.3	112	100.2	1.90	12.47	-0.23	17.67	5.20	3.401	-1.93	11.43	6.24
98.3	118	100.0	2.00	12.62	-0.41	18.00	5.38	3.346	-3.46	11.69	6.31
99.4	124	100.3	2.10	12.78	-0.15	17.90	5.12	3.497	-1.27	11.51	6.39
100.6	129	100.6	2.20	12.97	0.13	17.80	4.83	3.684	1.09	11.32	6.48
102.0	135	100.8	2.30	13.17	0.29	17.85	4.67	3.820	2.35	11.26	6.59
102.7	141	100.4	2.40	13.28	-0.01	18.26	4.98	3.668	-0.10	11.62	6.64
103.7	147	100.1	2.50	13.42	-0.35	18.73	5.32	3.524	-2.74	12.02	6.71
104.3	153	99.9	2.60	13.50	-0.57	19.04	5.53	3.439	-4.44	12.29	6.75
105.4	159	100.0	2.70	13.66	-0.45	19.07	5.41	3.523	-3.45	12.24	6.83
105.8	165	100.3	2.80	13.71	-0.13	18.81	5.10	3.690	-1.00	11.95	6.85
106.4	171	100.5	2.90	13.80	0.08	18.68	4.88	3.827	0.64	11.78	6.90
107.1	176	100.2	3.00	13.90	-0.24	19.10	5.21	3.670	-1.81	12.15	6.95
108.0	182	99.9	3.10	14.03	-0.60	19.60	5.57	3.520	-4.51	12.58	7.01
108.9	188	99.6	3.20	14.14	-0.83	19.94	5.80	3.441	-6.17	12.87	7.07
109.0	194	99.8	3.30	14.16	-0.64	19.77	5.61	3.523	-4.80	12.69	7.08
109.9	200	100.1	3.40	14.29	-0.34	19.59	5.30	3.695	-2.47	12.44	7.14
110.6	206	100.3	3.50	14.38	-0.13	19.48	5.10	3.820	-0.98	12.29	7.19
111.3	212	100.0	3.60	14.47	-0.47	19.90	5.43	3.662	-3.41	12.67	7.23
112.0	218	99.5	3.70	14.57	-0.92	20.45	5.88	3.477	-6.62	13.17	7.29
112.3	224	99.6	3.80	14.61	-0.85	20.42	5.81	3.512	-6.11	13.12	7.30
112.9	229	99.9	3.90	14.67	-0.51	20.15	5.48	3.679	-3.67	12.81	7.34
113.3	235	100.2	4.00	14.73	-0.30	19.99	5.26	3.799	-2.11	12.62	7.36
114.0	241	99.7	4.10	14.81	-0.74	20.52	5.71	3.595	-5.28	13.12	7.41
114.5	247	99.5	4.20	14.89	-0.97	20.82	5.94	3.508	-6.86	13.38	7.44
115.3	253	99.8	4.30	15.00	-0.67	20.64	5.63	3.663	-4.69	13.14	7.50
115.7	259	100.0	4.40	15.04	-0.47	20.48	5.43	3.768	-3.28	12.96	7.52
116.1	265	99.5	4.50	15.10	-1.00	21.06	5.97	3.529	-6.99	13.52	7.55
117.3	271	99.4	4.60	15.26	-1.09	21.32	6.06	3.518	-7.55	13.69	7.63
118.3	276	99.8	4.70	15.40	-0.71	21.07	5.67	3.714	-4.84	13.37	7.70
118.6	282	99.9	4.80	15.43	-0.52	20.91	5.48	3.815	-3.53	13.20	7.72
119.3	288	99.5	4.90	15.52	-0.96	21.44	5.93	3.618	-6.51	13.68	7.76
119.6	294	99.5	5.00	15.56	-0.93	21.46	5.90	3.638	-6.31	13.68	7.78
120.3	309	99.8	5.25	15.63	-0.69	21.29	5.66	3.761	-4.68	13.47	7.81
121.2	324	99.8	5.50	15.73	-0.68	21.37	5.65	3.785	-4.56	13.51	7.86
122.5	338	99.4	5.75	15.88	-1.03	21.88	6.00	3.647	-6.86	13.94	7.94
123.5	353	99.4	6.00	16.00	-1.01	21.98	5.98	3.675	-6.68	13.98	8.00
124.8	368	99.6	6.25	16.16	-0.87	21.99	5.83	3.770	-5.65	13.91	8.08
125.9	382	99.0	6.50	16.28	-1.45	22.69	6.41	3.539	-9.36	14.55	8.14
127.4	397	99.6	6.75	16.45	-0.89	22.31	5.85	3.810	-5.69	14.08	8.23
127.9	412	99.2	7.00	16.49	-1.29	22.75	6.25	3.637	-8.22	14.50	8.25
129.4	426	99.1	7.25	16.67	-1.40	23.04	6.37	3.618	-8.85	14.70	8.34
130.2	441	99.2	7.50	16.75	-1.25	22.97	6.21	3.696	-7.84	14.59	8.38
130.9	456	98.8	7.75	16.81	-1.62	23.40	6.59	3.553	-10.15	14.99	8.41
131.9	471	99.0	8.00	16.92	-1.45	23.34	6.42	3.637	-9.03	14.88	8.46
132.5	485	99.2	8.25	16.97	-1.23	23.16	6.19	3.741	-7.60	14.68	8.48
133.5	500	99.0	8.50	17.07	-1.46	23.49	6.42	3.659	-8.97	14.96	8.54
134.3	515	98.7	8.75	17.14	-1.80	23.90	6.76	3.534	-11.04	15.33	8.57
135.2	529	99.0	9.00	17.24	-1.43	23.63	6.39	3.696	-8.72	15.01	8.62
136.1	544	98.5	9.25	17.32	-1.95	24.24	6.92	3.504	-11.87	15.58	8.66
137.0	559	99.0	9.50	17.40	-1.46	23.83	6.43	3.707	-8.84	15.13	8.70
137.9	574	99.1	9.75	17.48	-1.34	23.79	6.31	3.771	-8.08	15.05	8.74
138.8	588	98.6	10.00	17.57	-1.87	24.41	6.83	3.572	-11.18	15.62	8.79
139.2	603	98.9	10.25	17.59	-1.56	24.12	6.53	3.694	-9.36	15.32	8.79
139.7	618	99.0	10.50	17.61	-1.47	24.05	6.44	3.735	-8.81	15.25	8.81
140.5	632	98.1	10.75	17.68	-2.32	24.97	7.29	3.425	-13.84	16.13	8.84
141.3	647	98.5	11.00	17.74	-1.92	24.63	6.89	3.576	-11.40	15.76	8.87
142.2	662	98.8	11.25	17.82	-1.69	24.48	6.66	3.676	-10.00	15.57	8.91
142.5	676	98.8	11.50	17.81	-1.66	24.44	6.63	3.687	-9.83	15.53	8.91
142.9	691	98.8	11.75	17.82	-1.67	24.46	6.63	3.687	-9.85	15.55	8.91
143.5	706	98.1	12.00	17.86	-2.40	25.23	7.37	3.425	-14.15	16.30	8.93
144.3	721	98.4	12.25	17.93	-2.05	24.95	7.02	3.555	-12.04	15.98	8.96
145.0	735	98.5	12.50	17.97	-2.00	24.93	6.96	3.581	-11.69	15.95	8.98

Performed By: ALO Input Validation: MAK Reviewed By: ALO Date Tested: 10/10/2019

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
Test No.	2	Lab Sample No.	42506001
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL	Test Conditions:	Undisturbed - Side And Double Drained

SAMPLE CONDITIONS

	Initial	After Consol.	Final
Tare Number	2001	NA	741
Wt. Tare & WS, gm	301.67	NA	1203.90
Wt. Tare & DS, gm	260.46	NA	894.01
Wt. Tare, gm	154.98	NA	186.34
Water Content, %	39.1	43.8	43.8
Wt. Tube & WS., gm	1388.2	NA	
Wt. Of Tube, gm	421.3	NA	
Wt. Of WS., gm	966.9	999.7	
Length 1, in	5.887	NA	
Length 2, in	5.89	NA	
Length 3, in	5.884	NA	
Top Diameter, in	2.846	NA	
Middle Diameter, in	2.86	NA	
Bottom Diameter, in	2.862	NA	
Average Length, in	5.887	5.855	
Average Diameter, in	2.856	2.796	
Average Area, in^2	6.41	6.14	
Sample Volume, in^3	37.71	36.54	
Unit Dry Wt., gms/cc	1.12	1.16	
Unit Dry Wt., pcf	70.2	72.5	
Specific Gravity, Assume	2.70	2.70	
Volume of Solids, cc	257.50		
Void Ratio, e	1.40		
Porosity, n	0.58		
Pore Volume, cc	360.52		
Saturation, %	75.3		

TEST CONDITIONS

Cell Pressure, psi	100.37	
Back Pressure, psi	90.41	
Effective Consolidating Pressure, psi	9.96	$\sigma 3$
Pore Pressure Parameter (B), %	1	

SATURATION AND CONSOLIDATION VOLUME CHANGES

Height Change, mils	Reading	Change	Consolidation	
Initial Dial Reading	7.17	0	Volume Change, ml	19.3
After Saturation	7.139	31	Volume Change, in^3	1.18
After Consolidation	7.138	32	Saturation Method:	Wet

STRAIN RATE CALCULATIONS

Calc. Strain Rate, %/min (t50=13.36)	0.00030	Strain Rate Used, %/min	0.00006
Calc. Deformation Rate, in/min	0.00175	Deformation Rate Used	0.00034

EFFECTIVE FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Effective Consolidating Pressure, psi	9.96	NA	σ_3
Maximum Effective Principal Stress Ratio	4.926	NA	σ_1'/σ_3'
Deviator Stress at Failure, psi	20.24	NA	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	5.50	NA	ε
Effective Minor Principal Stress at Failure, psi	5.15	NA	σ_3'
Effective Major Principal Stress at Failure, psi	25.39	NA	σ_1'
Mohr's Circle Stress Path (Origin of Circle), psi	15.27	NA	p'
Mohr's Circle Stress Path (Radius of Circle), psi	10.12	NA	q

TOTAL FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Deviator Stress at Failure, psi	20.24	NA	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	5.50	NA	ε
Total Minor Principal Stress at Failure, psi	9.96	NA	σ_3
Total Major Principal Stress at Failure, psi	30.20	NA	σ_1

TEST DATA

Axial Load	Axial Deformation	Total Pore Water Pressure	Axial Strain	Principal Stress Difference (Deviator Stress)	Induced Pore Water Pressure	Effective Major Principal Stress	Effective Minor Principal Stress	Effective Principal Stress Ratio	A-Bar	Mohr's Circle Stress Paths: Origin of Circle	Mohr's Circle Stress Paths: Radius of Circle
lb.	mils	psi	%	psi	psi	psi	psi			psi	psi
P	ΔH	U	ε	$\sigma_1-\sigma_3$	ΔU	σ_1'	σ_3'	σ_1'/σ_3'	A'	p'	q
20.0	0	90.4	0	0.00	0	NA	NA	NA	NA	9.96	0
30.1	1	90.8	0.02	1.64	0.41	11.19	9.55	1.172	27.70	10.37	0.82
36.0	3	91.2	0.05	2.61	0.79	11.78	9.17	1.284	33.44	10.47	1.30
41.9	4	91.5	0.07	3.56	1.14	12.38	8.82	1.404	35.26	10.60	1.78
46.4	6	91.9	0.10	4.29	1.49	12.77	8.48	1.507	38.02	10.63	2.15
49.9	7	92.2	0.12	4.86	1.78	13.05	8.18	1.594	40.25	10.61	2.43
53.3	9	92.5	0.15	5.41	2.05	13.33	7.91	1.684	41.66	10.62	2.71
56.2	10	92.7	0.18	5.89	2.29	13.57	7.67	1.768	42.71	10.62	2.95
58.7	12	92.9	0.20	6.30	2.50	13.77	7.47	1.844	43.55	10.62	3.15
61.1	13	93.1	0.23	6.69	2.69	13.96	7.28	1.919	44.17	10.62	3.34
63.6	15	93.2	0.25	7.09	2.76	14.30	7.21	1.984	42.74	10.75	3.54
65.6	16	93.2	0.28	7.41	2.79	14.58	7.17	2.033	41.41	10.88	3.71
67.5	18	93.2	0.30	7.72	2.83	14.86	7.14	2.082	40.26	11.00	3.86
69.7	19	93.2	0.33	8.07	2.81	15.23	7.16	2.128	38.21	11.19	4.04
71.1	21	93.3	0.35	8.30	2.92	15.35	7.05	2.177	38.60	11.20	4.15
72.7	22	93.4	0.38	8.55	2.95	15.57	7.02	2.219	37.90	11.29	4.28
74.3	23	93.4	0.40	8.81	2.99	15.78	6.97	2.264	37.37	11.37	4.40
76.0	25	93.4	0.43	9.08	3.01	16.04	6.95	2.307	36.45	11.49	4.54
77.6	26	93.5	0.45	9.34	3.09	16.21	6.87	2.359	36.41	11.54	4.67
78.8	28	93.5	0.48	9.54	3.13	16.37	6.83	2.397	36.10	11.60	4.77
80.2	29	93.6	0.50	9.76	3.18	16.55	6.79	2.438	35.74	11.67	4.88
81.2	31	93.6	0.53	9.91	3.23	16.65	6.74	2.471	35.75	11.70	4.96
83.0	32	93.6	0.55	10.20	3.23	16.94	6.74	2.514	34.74	11.84	5.10
84.1	34	93.7	0.58	10.38	3.32	17.03	6.65	2.562	35.13	11.84	5.19
85.6	35	93.8	0.60	10.62	3.35	17.24	6.62	2.605	34.64	11.93	5.31
86.8	37	93.8	0.63	10.82	3.39	17.39	6.57	2.646	34.45	11.98	5.41
88.0	38	93.8	0.65	11.01	3.41	17.57	6.56	2.679	33.98	12.06	5.51
89.3	40	93.8	0.68	11.22	3.40	17.78	6.56	2.709	33.33	12.17	5.61
90.1	41	93.9	0.70	11.34	3.49	17.81	6.47	2.751	33.82	12.14	5.67
91.2	42	93.9	0.73	11.51	3.52	17.95	6.44	2.788	33.64	12.20	5.76
92.2	44	94.0	0.75	11.68	3.62	18.03	6.35	2.841	34.03	12.19	5.84
93.3	45	94.1	0.78	11.85	3.71	18.11	6.26	2.894	34.36	12.18	5.93
94.5	47	94.3	0.80	12.04	3.85	18.15	6.11	2.969	35.14	12.13	6.02
95.4	48	94.4	0.83	12.19	3.96	18.19	6.00	3.031	35.73	12.10	6.09
96.3	50	94.5	0.85	12.32	4.07	18.22	5.90	3.089	36.25	12.06	6.16

97.0	51	94.6	0.88	12.43	4.17	18.23	5.79	3.146	36.86	12.01	6.22
97.9	53	94.6	0.90	12.58	4.24	18.31	5.73	3.195	37.00	12.02	6.29
98.9	54	94.8	0.93	12.73	4.38	18.32	5.58	3.280	37.80	11.95	6.37
99.6	56	94.9	0.95	12.84	4.47	18.34	5.50	3.337	38.23	11.92	6.42
100.2	57	95.0	0.98	12.94	4.55	18.35	5.41	3.390	38.65	11.88	6.47
101.1	59	95.0	1.00	13.08	4.57	18.47	5.39	3.425	38.41	11.93	6.54
104.1	64	94.8	1.10	13.55	4.39	19.12	5.57	3.431	35.61	12.35	6.77
106.8	70	94.7	1.20	13.98	4.27	19.68	5.70	3.453	33.54	12.69	6.99
109.7	76	94.6	1.30	14.42	4.22	20.17	5.75	3.508	32.13	12.96	7.21
112.1	82	94.8	1.40	14.79	4.37	20.39	5.60	3.643	32.44	12.99	7.40
114.7	88	95.1	1.50	15.20	4.72	20.44	5.24	3.900	34.15	12.84	7.60
116.6	94	95.4	1.60	15.48	4.95	20.50	5.02	4.085	35.11	12.76	7.74
118.6	100	95.3	1.70	15.79	4.93	20.82	5.03	4.136	34.33	12.93	7.89
120.0	105	95.1	1.80	16.00	4.68	21.28	5.28	4.028	32.15	13.28	8.00
122.0	111	94.9	1.90	16.31	4.51	21.76	5.45	3.993	30.42	13.60	8.15
123.6	117	94.8	2.00	16.54	4.43	22.08	5.54	3.987	29.39	13.81	8.27
125.0	123	95.1	2.10	16.75	4.70	22.02	5.26	4.182	30.83	13.64	8.38
126.5	129	95.4	2.20	16.97	4.98	21.96	4.99	4.403	32.23	13.47	8.49
128.2	135	95.5	2.30	17.22	5.10	22.09	4.87	4.540	32.53	13.48	8.61
129.8	141	95.3	2.40	17.45	4.86	22.56	5.10	4.421	30.62	13.83	8.73
130.9	146	95.0	2.50	17.61	4.63	22.95	5.34	4.299	28.86	14.15	8.81
132.0	152	94.9	2.60	17.77	4.46	23.28	5.51	4.226	27.56	14.39	8.88
132.8	158	95.0	2.70	17.87	4.62	23.22	5.34	4.344	28.41	14.28	8.94
133.4	164	95.3	2.80	17.96	4.88	23.04	5.08	4.533	29.87	14.06	8.98
134.2	170	95.5	2.90	18.06	5.08	22.94	4.88	4.699	30.93	13.91	9.03
135.3	176	95.3	3.00	18.23	4.87	23.32	5.10	4.575	29.34	14.21	9.11
136.1	182	94.9	3.10	18.32	4.52	23.76	5.44	4.367	27.13	14.60	9.16
137.1	188	94.8	3.20	18.47	4.36	24.07	5.60	4.297	25.97	14.83	9.23
138.1	193	95.0	3.30	18.61	4.57	24.00	5.40	4.449	26.98	14.70	9.30
138.8	199	95.2	3.40	18.70	4.84	23.83	5.13	4.647	28.43	14.48	9.35
139.9	205	95.4	3.50	18.85	5.03	23.78	4.93	4.822	29.34	14.36	9.42
140.2	211	95.1	3.60	18.87	4.74	24.09	5.22	4.614	27.62	14.66	9.43
140.8	217	94.8	3.70	18.94	4.44	24.47	5.53	4.429	25.75	15.00	9.47
141.8	223	94.8	3.80	19.08	4.44	24.61	5.52	4.456	25.58	15.06	9.54
142.5	229	95.2	3.90	19.18	4.74	24.40	5.22	4.673	27.19	14.81	9.59
143.4	234	95.3	4.00	19.30	4.93	24.34	5.04	4.833	28.06	14.69	9.65
144.2	240	95.0	4.10	19.40	4.58	24.79	5.39	4.601	25.92	15.09	9.70
143.1	246	94.9	4.20	19.22	4.45	24.73	5.51	4.487	25.46	15.12	9.61
143.6	252	95.1	4.30	19.27	4.70	24.53	5.26	4.665	26.82	14.90	9.64
144.1	258	95.3	4.40	19.33	4.86	24.43	5.11	4.785	27.62	14.77	9.66
144.8	264	94.8	4.50	19.41	4.42	24.96	5.54	4.501	25.02	15.25	9.71
145.6	270	94.8	4.60	19.52	4.38	25.10	5.58	4.496	24.67	15.34	9.76
145.0	275	95.1	4.70	19.40	4.74	24.63	5.23	4.710	26.82	14.93	9.70
146.4	281	95.3	4.80	19.60	4.88	24.68	5.09	4.851	27.34	14.89	9.80
147.2	287	94.9	4.90	19.71	4.53	25.14	5.43	4.626	25.26	15.29	9.85
148.3	293	95.0	5.00	19.86	4.60	25.22	5.37	4.701	25.45	15.30	9.93
149.5	308	95.2	5.25	19.99	4.76	25.20	5.21	4.837	26.14	15.20	9.99
151.5	322	95.2	5.50	20.24	4.81	25.39	5.15	4.926	26.12	15.27	10.12
152.7	337	94.9	5.75	20.37	4.49	25.85	5.47	4.723	24.23	15.66	10.19
153.8	352	94.8	6.00	20.49	4.40	26.05	5.57	4.681	23.60	15.81	10.24
155.0	366	95.1	6.25	20.63	4.67	25.91	5.29	4.899	24.91	15.60	10.31
157.7	381	94.5	6.50	20.98	4.13	26.81	5.83	4.597	21.65	16.32	10.49
158.7	395	94.9	6.75	21.07	4.49	26.54	5.47	4.850	23.43	16.01	10.53
160.1	410	94.6	7.01	21.23	4.21	26.98	5.76	4.688	21.78	16.37	10.61
163.6	425	94.4	7.26	21.70	4.03	27.64	5.94	4.654	20.39	16.79	10.85
165.4	439	94.6	7.51	21.91	4.15	27.72	5.81	4.770	20.84	16.76	10.95
166.8	454	94.4	7.76	22.06	3.96	28.07	6.00	4.676	19.73	17.03	11.03
166.1	469	94.3	8.01	21.90	3.94	27.92	6.02	4.637	19.79	16.97	10.95
168.3	483	94.5	8.26	22.16	4.13	27.99	5.83	4.799	20.49	16.91	11.08
168.3	498	94.3	8.51	22.10	3.93	28.14	6.04	4.661	19.53	17.09	11.05
169.9	513	94.0	8.76	22.29	3.61	28.64	6.36	4.506	17.79	17.50	11.14
171.3	527	94.3	9.01	22.43	3.86	28.54	6.11	4.674	18.90	17.32	11.22
172.1	542	93.9	9.26	22.48	3.49	28.95	6.47	4.473	17.07	17.71	11.24
173.8	557	94.2	9.51	22.67	3.79	28.85	6.18	4.670	18.36	17.51	11.34
174.0	571	94.3	9.76	22.63	3.85	28.75	6.12	4.700	18.68	17.43	11.32
175.9	586	93.8	10.01	22.86	3.37	29.46	6.59	4.468	16.21	18.02	11.43
176.6	601	94.0	10.26	22.89	3.59	29.27	6.37	4.591	17.23	17.82	11.45
178.1	615	94.0	10.51	23.05	3.64	29.38	6.33	4.643	17.34	17.85	11.52
179.6	630	93.3	10.76	23.20	2.85	30.31	7.11	4.262	13.52	18.71	11.60
180.1	644	93.6	11.01	23.20	3.24	29.93	6.72	4.452	15.35	18.32	11.60
181.2	659	93.7	11.26	23.30	3.34	29.92	6.62	4.519	15.77	18.27	11.65
181.6	674	93.7	11.51	23.29	3.33	29.92	6.63	4.512	15.72	18.28	11.65
182.8	688	93.6	11.76	23.40	3.24	30.13	6.73	4.479	15.20	18.43	11.70
183.3	703	93.1	12.01	23.41	2.66	30.71	7.30	4.207	12.50	19.01	11.71
184.2	718	93.3	12.26	23.47	2.91	30.52	7.05	4.328	13.64	18.78	11.73
184.6	732	93.3	12.51	23.45	2.89	30.53	7.08	4.314	13.52	18.81	11.73

Performed By: ALO   Input Validation: MAK   Reviewed By: ALO   Date Tested: 10/10/2019

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
Test No.	3	Lab Sample No.	42506001
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL	Test Conditions:	Undisturbed - Side And Double Drained

SAMPLE CONDITIONS

	Initial	After Consol.	Final
Tare Number	2001	NA	742
Wt. Tare & WS, gm	301.67	NA	1263.68
Wt. Tare & DS, gm	260.46	NA	963.36
Wt. Tare, gm	154.98	NA	186.79
Water Content, %	39.1	38.7	38.7
Wt. Tube & WS., gm	1507.3	NA	
Wt. Of Tube, gm	429.7	NA	
Wt. Of WS., gm	1077.7	1074.6	
Length 1, in	6.002	NA	
Length 2, in	5.979	NA	
Length 3, in	5.976	NA	
Top Diameter, in	2.887	NA	
Middle Diameter, in	2.866	NA	
Bottom Diameter, in	2.868	NA	
Average Length, in	5.986	5.908	
Average Diameter, in	2.874	2.795	
Average Area, in^2	6.49	6.13	
Sample Volume, in^3	38.82	36.80	
Unit Dry Wt., gms/cc	1.22	1.28	
Unit Dry Wt., pcf	76.0	80.2	
Specific Gravity, Assume	2.70	2.70	
Volume of Solids, cc	287.01		
Void Ratio, e	1.22		
Porosity, n	0.55		
Pore Volume, cc	349.17		
Saturation, %	86.7		

TEST CONDITIONS

Cell Pressure, psi	110.35	
Back Pressure, psi	90.37	
Effective Consolidating Pressure, psi	19.98	$\sigma 3$
Pore Pressure Parameter (B), %	1	

SATURATION AND CONSOLIDATION VOLUME CHANGES

Height Change, mils	Reading	Change	Consolidation	
Initial Dial Reading	7.33	0	Volume Change, ml	33.1
After Saturation	7.301	29	Volume Change, in^3	2.02
After Consolidation	7.252	78	Saturation Method:	Wet

STRAIN RATE CALCULATIONS

Calc. Strain Rate, %/min (t50=12.48)	0.00032	Strain Rate Used, %/min	0.00006
Calc. Deformation Rate, in/min	0.00189	Deformation Rate Used	0.00034

EFFECTIVE FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Effective Consolidating Pressure, psi	19.98	NA	σ_3
Maximum Effective Principal Stress Ratio	3.743	NA	σ_1'/σ_3'
Deviator Stress at Failure, psi	22.93	NA	$\sigma_1 - \sigma_3$
Axial Strain at Failure, %	8.26	NA	ε
Effective Minor Principal Stress at Failure, psi	8.36	NA	σ_3'
Effective Major Principal Stress at Failure, psi	31.29	NA	σ_1'
Mohr's Circle Stress Path (Origin of Circle), psi	19.83	NA	p'
Mohr's Circle Stress Path (Radius of Circle), psi	11.47	NA	q

TOTAL FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Deviator Stress at Failure, psi	22.93	NA	$\sigma_1 - \sigma_3$
Axial Strain at Failure, %	8.26	NA	ε
Total Minor Principal Stress at Failure, psi	19.98	NA	σ_3
Total Major Principal Stress at Failure, psi	42.91	NA	σ_1

TEST DATA

Axial Load	Axial Deformation	Total Pore Water Pressure	Axial Strain	Principal Stress Difference (Deviator Stress)	Induced Pore Water Pressure	Effective Major Principal Stress	Effective Minor Principal Stress	Effective Principal Stress Ratio	A-Bar	Mohr's Circle Stress Paths: Origin of Circle	Mohr's Circle Stress Paths: Radius of Circle
lb.	mils	psi	%	psi	psi	psi	psi			psi	psi
P	ΔH	U	ε	$\sigma_1 - \sigma_3$	ΔU	σ_1'	σ_3'	σ_1'/σ_3'	A'	p'	q
22.1	0	90.4	0	0	0	NA	NA	NA	NA	19.98	0
35.4	1	91.0	0.02	2.17	0.60	21.54	19.38	1.112	28.94	20.46	1.08
40.8	3	91.4	0.05	3.05	1.04	21.99	18.94	1.161	35.50	20.46	1.53
46.0	4	91.9	0.08	3.89	1.52	22.35	18.46	1.211	40.66	20.41	1.94
51.4	6	92.4	0.10	4.78	2.00	22.75	17.98	1.266	43.68	20.36	2.39
56.6	7	92.8	0.13	5.62	2.48	23.13	17.50	1.321	45.85	20.32	2.81
61.2	9	93.3	0.15	6.37	2.92	23.43	17.06	1.374	47.76	20.24	3.19
65.1	10	93.7	0.18	7.00	3.30	23.68	16.68	1.420	49.06	20.18	3.50
68.6	12	94.1	0.20	7.56	3.72	23.83	16.26	1.465	51.18	20.04	3.78
71.8	13	94.4	0.23	8.08	4.03	24.04	15.95	1.507	51.89	19.99	4.04
74.4	15	94.7	0.25	8.51	4.30	24.20	15.68	1.543	52.57	19.94	4.26
77.1	16	94.9	0.28	8.95	4.55	24.37	15.42	1.580	53.03	19.90	4.47
79.5	18	95.1	0.30	9.33	4.73	24.58	15.25	1.612	52.82	19.91	4.66
81.6	19	95.4	0.33	9.67	5.06	24.60	14.92	1.648	54.46	19.76	4.84
83.8	21	95.7	0.35	10.02	5.28	24.71	14.70	1.682	54.93	19.71	5.01
85.5	22	95.9	0.38	10.31	5.48	24.81	14.50	1.711	55.36	19.65	5.15
87.4	24	96.0	0.40	10.61	5.64	24.95	14.34	1.739	55.35	19.65	5.30
89.2	25	96.2	0.43	10.89	5.86	25.01	14.12	1.771	56.04	19.57	5.45
91.1	27	96.4	0.45	11.19	6.04	25.13	13.94	1.803	56.22	19.53	5.60
92.6	28	96.6	0.48	11.45	6.23	25.20	13.75	1.832	56.66	19.48	5.72
94.4	30	96.8	0.50	11.73	6.38	25.33	13.59	1.863	56.69	19.46	5.87
95.8	31	96.9	0.53	11.95	6.48	25.45	13.49	1.886	56.51	19.47	5.98
97.2	33	97.1	0.55	12.18	6.70	25.46	13.28	1.917	57.28	19.37	6.09
98.7	34	97.2	0.58	12.42	6.84	25.57	13.14	1.945	57.32	19.35	6.21
100.1	35	97.3	0.60	12.65	6.97	25.66	13.01	1.972	57.38	19.34	6.32
101.5	37	97.5	0.63	12.86	7.09	25.75	12.89	1.998	57.41	19.32	6.43
102.9	38	97.5	0.65	13.09	7.15	25.92	12.83	2.020	56.87	19.38	6.54
104.0	40	97.7	0.68	13.26	7.36	25.88	12.62	2.051	57.79	19.25	6.63
104.9	41	97.8	0.70	13.40	7.46	25.92	12.52	2.071	58.00	19.22	6.70
105.9	43	98.0	0.73	13.56	7.59	25.95	12.39	2.094	58.27	19.17	6.78
107.2	44	98.1	0.75	13.77	7.68	26.07	12.30	2.120	58.09	19.18	6.89
108.2	46	98.2	0.78	13.93	7.85	26.06	12.13	2.149	58.68	19.10	6.97
109.3	47	98.4	0.80	14.10	7.98	26.10	12.00	2.175	58.96	19.05	7.05
110.5	49	98.5	0.83	14.30	8.09	26.19	11.89	2.203	58.93	19.04	7.15
111.7	50	98.6	0.85	14.49	8.20	26.27	11.78	2.230	58.95	19.02	7.24
112.5	52	98.6	0.88	14.61	8.24	26.34	11.73	2.245	58.80	19.04	7.30

113.4	53	98.8	0.90	14.74	8.42	26.30	11.56	2.276	59.48	18.93	7.37
114.6	55	98.9	0.93	14.95	8.54	26.38	11.44	2.307	59.54	18.91	7.47
115.6	56	99.0	0.95	15.09	8.64	26.43	11.34	2.331	59.62	18.89	7.55
116.2	58	99.1	0.98	15.19	8.70	26.47	11.28	2.347	59.63	18.88	7.60
116.7	59	99.1	1.00	15.27	8.70	26.55	11.27	2.354	59.37	18.91	7.64
119.4	65	99.3	1.10	15.69	8.93	26.74	11.05	2.421	59.27	18.90	7.85
122.3	71	99.5	1.20	16.13	9.15	26.96	10.83	2.490	59.09	18.89	8.07
125.2	77	99.7	1.30	16.59	9.35	27.21	10.62	2.562	58.73	18.92	8.30
127.5	83	100.0	1.40	16.94	9.61	27.31	10.37	2.633	59.09	18.84	8.47
130.2	89	100.3	1.50	17.37	9.88	27.46	10.09	2.720	59.29	18.78	8.68
132.4	95	100.5	1.60	17.70	10.10	27.58	9.88	2.791	59.43	18.73	8.85
133.9	101	100.6	1.70	17.91	10.20	27.69	9.78	2.831	59.30	18.74	8.96
135.6	106	100.6	1.80	18.18	10.18	27.97	9.80	2.855	58.34	18.89	9.09
137.0	112	100.7	1.90	18.38	10.29	28.07	9.69	2.897	58.32	18.88	9.19
138.9	118	100.8	2.00	18.67	10.41	28.24	9.57	2.950	58.07	18.91	9.33
140.9	124	101.0	2.10	18.96	10.60	28.34	9.38	3.021	58.24	18.86	9.48
142.5	130	101.1	2.20	19.20	10.75	28.43	9.23	3.081	58.33	18.83	9.60
144.0	136	101.3	2.30	19.41	10.89	28.50	9.09	3.136	58.44	18.79	9.71
144.9	142	101.2	2.40	19.53	10.86	28.65	9.12	3.143	57.92	18.88	9.77
145.8	148	101.2	2.50	19.67	10.78	28.87	9.20	3.138	57.07	19.04	9.84
146.8	154	101.2	2.60	19.79	10.84	28.93	9.14	3.166	57.05	19.03	9.90
148.0	160	101.4	2.70	19.97	11.00	28.95	8.98	3.225	57.38	18.96	9.99
150.0	166	101.5	2.80	20.27	11.16	29.09	8.82	3.298	57.34	18.95	10.14
150.9	172	101.6	2.90	20.39	11.25	29.12	8.73	3.336	57.47	18.92	10.19
151.9	177	101.6	3.00	20.52	11.21	29.29	8.77	3.340	56.90	19.03	10.26
152.0	183	101.5	3.10	20.53	11.17	29.34	8.81	3.330	56.68	19.07	10.26
153.0	189	101.5	3.20	20.66	11.16	29.48	8.82	3.341	56.26	19.15	10.33
154.0	195	101.6	3.30	20.79	11.23	29.53	8.75	3.377	56.29	19.14	10.39
155.3	201	101.8	3.40	20.98	11.39	29.57	8.59	3.442	56.53	19.08	10.49
156.4	207	101.9	3.50	21.12	11.49	29.61	8.49	3.489	56.66	19.05	10.56
156.2	213	101.8	3.60	21.08	11.38	29.67	8.60	3.452	56.26	19.13	10.54
156.9	219	101.7	3.70	21.16	11.36	29.77	8.62	3.455	55.94	19.20	10.58
157.3	225	101.8	3.80	21.21	11.43	29.76	8.55	3.480	56.12	19.16	10.60
158.7	231	101.9	3.90	21.39	11.54	29.84	8.44	3.534	56.16	19.14	10.70
159.1	237	101.9	4.00	21.45	11.52	29.91	8.46	3.534	55.93	19.19	10.72
159.2	242	101.8	4.10	21.43	11.47	29.94	8.50	3.520	55.77	19.22	10.72
159.6	248	101.9	4.20	21.47	11.50	29.95	8.48	3.532	55.79	19.22	10.74
160.5	254	102.0	4.30	21.60	11.60	29.98	8.38	3.579	55.96	19.18	10.80
161.3	260	102.0	4.40	21.69	11.64	30.03	8.34	3.602	55.92	19.18	10.84
161.4	266	101.9	4.50	21.68	11.56	30.11	8.42	3.574	55.51	19.26	10.84
162.1	272	102.0	4.60	21.77	11.60	30.14	8.38	3.599	55.53	19.26	10.88
162.9	278	102.0	4.70	21.88	11.61	30.24	8.37	3.614	55.28	19.31	10.94
163.1	284	102.1	4.81	21.88	11.69	30.16	8.28	3.640	55.68	19.22	10.94
163.3	290	102.0	4.91	21.89	11.61	30.25	8.36	3.617	55.28	19.31	10.94
164.5	296	102.1	5.01	22.06	11.72	30.32	8.26	3.671	55.33	19.29	11.03
165.3	310	102.1	5.26	22.12	11.71	30.39	8.27	3.677	55.15	19.33	11.06
166.9	325	102.1	5.51	22.31	11.76	30.52	8.22	3.715	54.92	19.37	11.15
167.2	340	102.1	5.76	22.30	11.71	30.57	8.27	3.698	54.71	19.42	11.15
168.0	355	102.0	6.01	22.35	11.67	30.66	8.31	3.689	54.37	19.49	11.18
169.4	370	102.1	6.26	22.51	11.77	30.71	8.21	3.743	54.49	19.46	11.25
169.6	384	102.0	6.51	22.48	11.63	30.84	8.35	3.692	53.86	19.59	11.24
170.8	399	102.1	6.76	22.60	11.69	30.89	8.29	3.726	53.87	19.59	11.30
171.5	414	102.0	7.01	22.65	11.62	31.01	8.36	3.709	53.44	19.68	11.32
172.0	429	101.8	7.26	22.67	11.46	31.19	8.52	3.661	52.66	19.85	11.33
173.0	444	102.0	7.51	22.75	11.65	31.08	8.33	3.730	53.34	19.71	11.37
173.2	458	101.9	7.76	22.73	11.57	31.14	8.41	3.704	53.04	19.77	11.36
173.8	473	101.9	8.01	22.76	11.55	31.19	8.43	3.699	52.84	19.81	11.38
175.4	488	102.0	8.26	22.93	11.62	31.29	8.36	3.743	52.77	19.83	11.47
175.8	503	101.9	8.51	22.93	11.57	31.34	8.41	3.725	52.55	19.88	11.46
175.8	517	101.8	8.76	22.87	11.40	31.45	8.58	3.664	51.91	20.02	11.43
177.1	532	101.9	9.01	22.99	11.57	31.40	8.41	3.734	52.41	19.91	11.50
177.0	547	101.8	9.26	22.92	11.47	31.43	8.51	3.693	52.11	19.97	11.46
178.1	562	101.9	9.51	23.02	11.54	31.46	8.44	3.726	52.21	19.95	11.51
178.9	577	101.9	9.76	23.07	11.51	31.54	8.47	3.724	51.95	20.01	11.54
178.6	591	101.8	10.01	22.96	11.40	31.55	8.58	3.676	51.70	20.06	11.48
179.7	606	101.8	10.26	23.06	11.43	31.61	8.55	3.697	51.61	20.08	11.53
180.2	621	101.8	10.51	23.07	11.47	31.58	8.50	3.713	51.80	20.04	11.54
180.3	636	101.7	10.76	23.02	11.28	31.72	8.70	3.646	51.05	20.21	11.51
180.9	650	101.7	11.01	23.03	11.36	31.66	8.62	3.672	51.36	20.14	11.52
181.8	665	101.8	11.26	23.11	11.38	31.70	8.59	3.689	51.31	20.15	11.55
182.2	680	101.8	11.51	23.10	11.39	31.69	8.59	3.688	51.35	20.14	11.55
182.3	695	101.7	11.76	23.05	11.32	31.71	8.66	3.662	51.15	20.19	11.53
182.2	710	101.5	12.01	22.96	11.16	31.79	8.82	3.603	50.61	20.30	11.48
183.8	724	101.6	12.26	23.12	11.21	31.90	8.77	3.636	50.48	20.34	11.56
184.1	739	101.6	12.51	23.10	11.26	31.82	8.72	3.650	50.76	20.27	11.55

Performed By: ALO Input Validation: MAK Reviewed By: ALO Date Tested: 10/10/2019

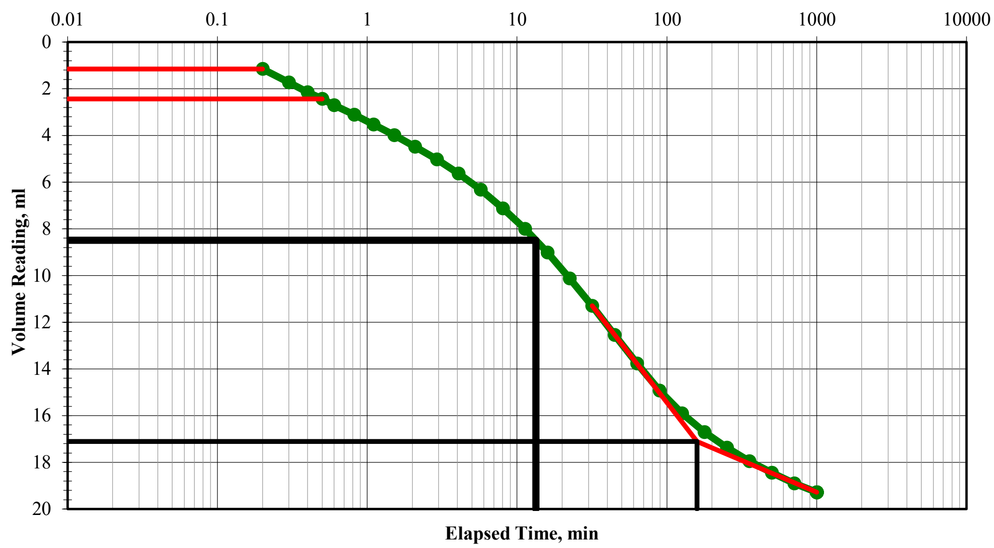
THREE DIMENSIONAL TRIAXIAL CONSOLIDATION TEST

Client	Civil & Environmental Consultants, Inc	Boring	B-31	**Staged Consolidation**	
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'	Consolidation Plot Stress, psi	5.0
Project No.	42506	Sample	ST-1	**Final Test Pressures**	
		Lab Sample I	42506001	Cell Pressure, psi	100.4
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAV			Back Pressure, psi	90.4
Test Conditions:	Undisturbed - Side And Double Drained			Effective Consol., psi	10.0
				Additional Consol. Volume, ml	0.0

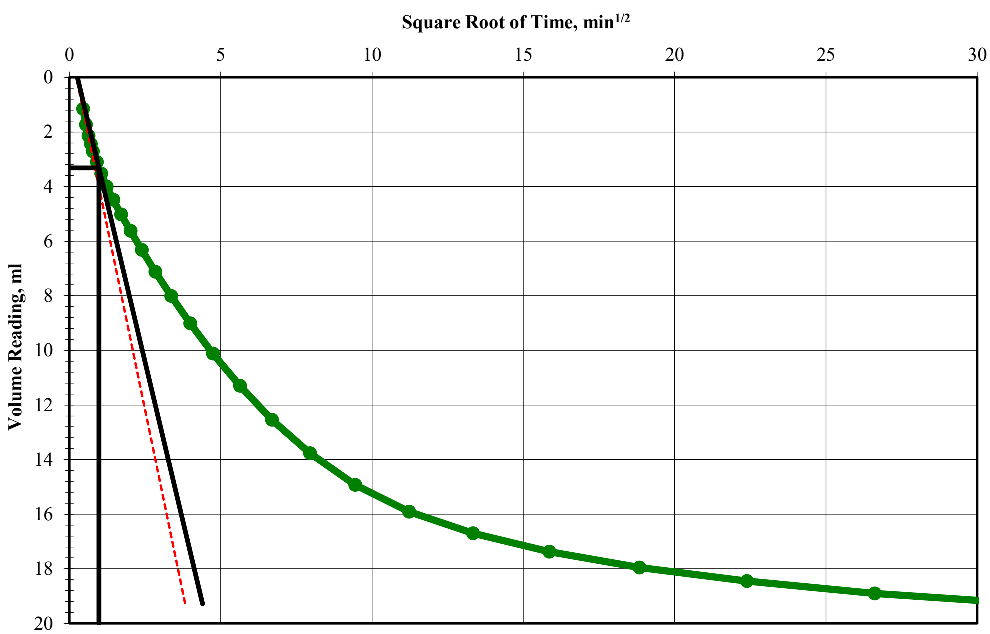
Consol. Start Date: 10/10/2019

Elapsed Time (min)	Sqrt Time ($min^{1/2}$)	Volume Reading ml
0	0	0.0
0.20	0.45	1.2
0.30	0.55	1.7
0.40	0.63	2.1
0.50	0.71	2.4
0.60	0.77	2.7
0.82	0.90	3.1
1.10	1.05	3.5
1.52	1.23	4.0
2.08	1.44	4.5
2.92	1.71	5.0
4.07	2.02	5.6
5.72	2.39	6.3
8.03	2.83	7.1
11.32	3.36	8.0
15.95	3.99	9.0
22.48	4.74	10.1
31.73	5.63	11.3
44.78	6.69	12.5
63.22	7.95	13.8
89.25	9.45	14.9
126.02	11.23	15.9
177.95	13.34	16.7
251.32	15.85	17.4
354.93	18.84	18.0
501.32	22.39	18.4
708.07	26.61	18.9
1000.12	31.62	19.3

Log of Elapsed Time vs. Volume Reading



Square Root of Elapsed Time vs. Volume Reading



Sqrt. of Elapsed Time vs Volume		Log of Elapsed Time vs Volume		Consolidation Summary	
T0 = 0 min.	V0 = -1.2 ml.	T0 = 0 min.	V0 = -0.1 ml.	Initial Volume Reading, ml	0.0
T90 = 1.0 min	V90 = 3.3 ml.	T50 = 13.4 min.	V50 = 8.5 ml.	Final Volume Reading, ml	19.3
T100 = NA min	V100 = 3.8 ml.	T100 = 158.9 min.	V100 = 17.1 ml.	Total Volume Change, ml	19.3

Tested By: ALO Input Validation: MAK Reviewed By: ALO Date Tested: 10/10/2019

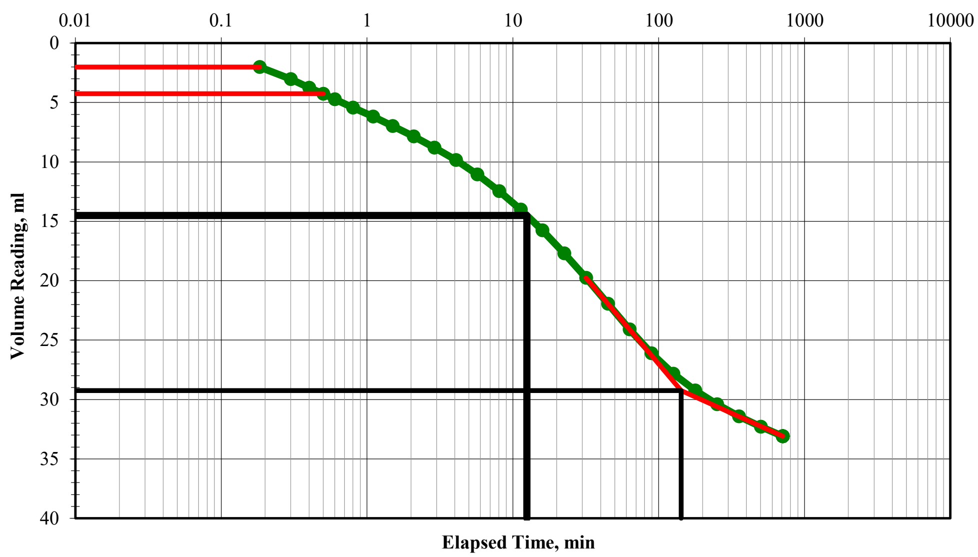
THREE DIMENSIONAL TRIAXIAL CONSOLIDATION TEST

Client	Civil & Environmental Consultants, Inc	Boring	B-31	**Staged Consolidation**	
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'	Consolidation Plot Stress, psi	15.0
Project No.	42506	Sample	ST-1	**Final Test Pressures**	
		Lab Sample I	42506001	Cell Pressure, psi	110.4
USCS Description:	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAV			Back Pressure, psi	90.4
Test Conditions:	Undisturbed - Side And Double Drained			Effective Consol., psi	20.0
				Additional Consol. Volume, m	0.0

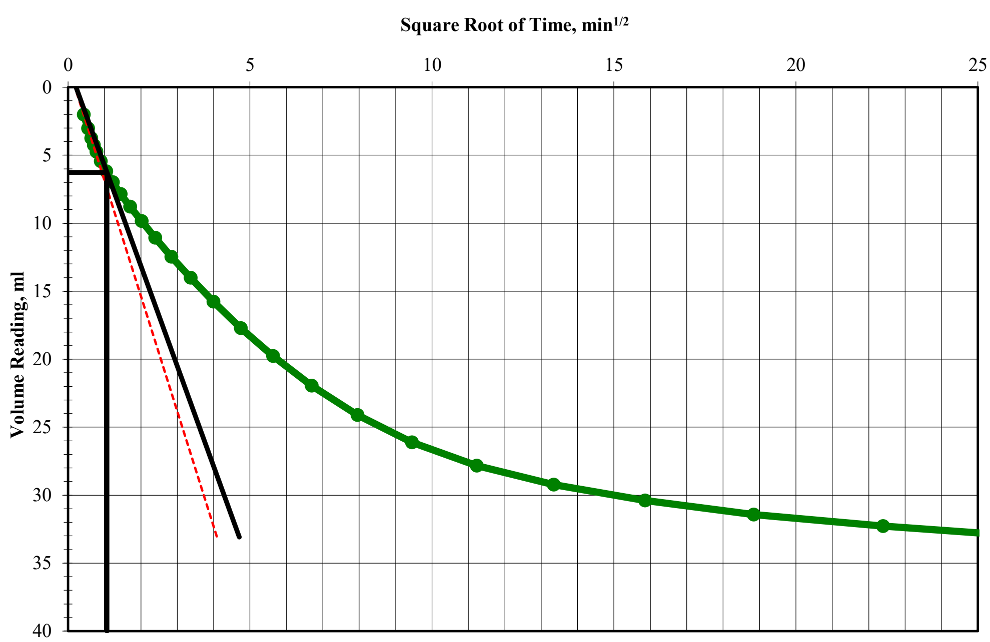
Consol. Start Date: 10/10/2019

Elapsed Time (min)	Sqrt Time (min$^{1/2}$)	Volume Reading ml
0	0	0.0
0.18	0.43	2.0
0.30	0.55	3.0
0.40	0.63	3.8
0.50	0.71	4.3
0.60	0.77	4.7
0.80	0.89	5.4
1.10	1.05	6.2
1.50	1.22	7.0
2.08	1.44	7.8
2.90	1.70	8.8
4.07	2.02	9.8
5.70	2.39	11.1
8.03	2.83	12.5
11.30	3.36	14.0
15.93	3.99	15.8
22.48	4.74	17.7
31.72	5.63	19.8
44.77	6.69	21.9
63.20	7.95	24.1
89.23	9.45	26.1
126.00	11.22	27.8
177.95	13.34	29.2
251.30	15.85	30.4
354.93	18.84	31.4
501.30	22.39	32.3
708.07	26.61	33.1

Log of Elapsed Time vs. Volume Reading



Square Root of Elapsed Time vs. Volume Reading



Sqrt. of Elapsed Time vs Volume		Log of Elapsed Time vs Volume		Consolidation Summary	
T0 = 0 min.	V0 = -1.6 ml.	T0 = 0 min.	V0 = -0.2 ml.	Initial Volume Reading, ml	0.0
T90 = 1.1 min	V90 = 6.3 ml.	T50 = 12.5 min.	V50 = 14.5 ml.	Final Volume Reading, ml	33.1
T100 = NA min	V100 = 7.1 ml.	T100 = 142.6 min.	V100 = 29.3 ml.	Total Volume Change, ml	33.1

Tested By: ALO Input Validation: MAK Reviewed By: ALO Date Tested: 10/10/2019

AFTER TEST PHOTOS

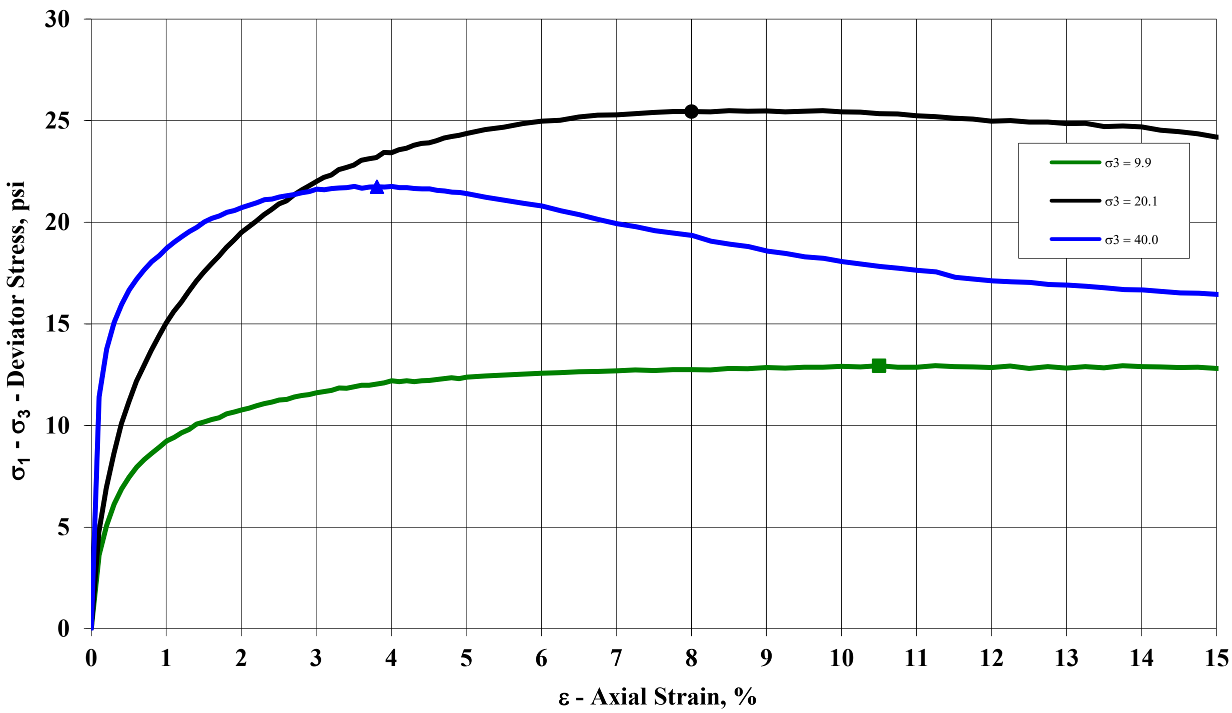
Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	3.0' - 5.0'
Project No.	42506	Sample	ST-1
		Lab No.	42506001
Visual Description	VERY DARK GRAYISH BROWN SANDY ELASTIC SILT WITH GRAVEL		
Sample Condition	Undisturbed - Side And Double Drained		

TEST 1 **TEST 2** **TEST 3**

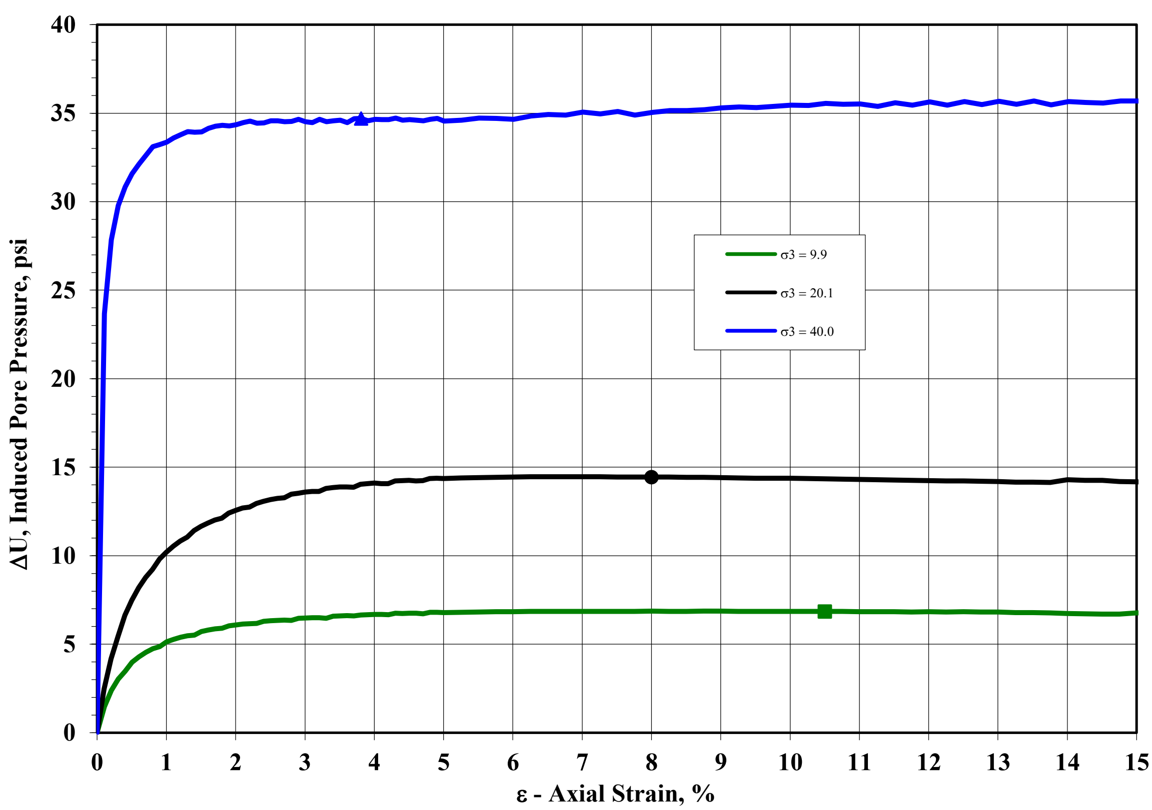
CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
Test Conditions:	Undisturbed - Side And Double Drained	Lab Sample No.	42506002
USCS Description:	VERY DARK BROWN SILTY SAND		

AXIAL STRAIN vs. DEVIATOR STRESS



AXIAL STRAIN vs. INDUCED PORE-WATER PRESSURE



CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
		Lab Sample No.	42506002
USCS Description:	VERY DARK BROWN SILTY SAND		
Test Conditions:	Undisturbed - Side And Double Drained		

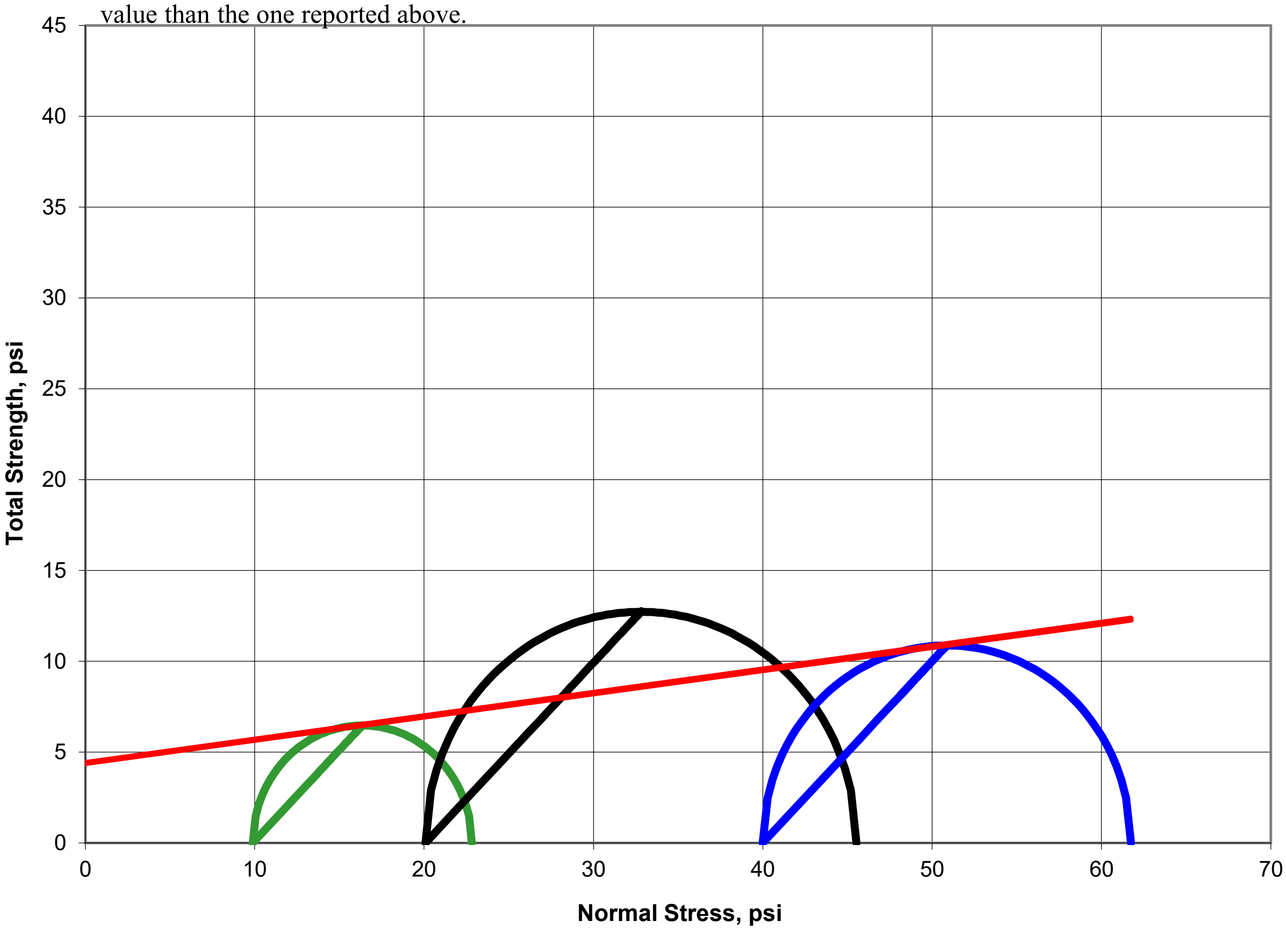
TOTAL STRESS

FAILURE CONDITION: MAX. EFFECTIVE PRINCIPAL STRESS RATIO

Test No.	Deviator Stress	Major Principal Stress	Minor Principal Stress	Strain at Failure	Mohr's Circle Stress Path		Failure Angle	
	σ1−σ3	*σ1*	*σ3*	*ε*	*(σ1+σ3)/2*	*(σ1−σ3)/2*		
	psi	psi	psi	%	psi	psi	α, deg	7.3
Test 1	12.94	22.82	9.88	10.50	16.35	6.47	a, psi	4.4
Test 2	25.45	45.53	20.08	8.00	32.81	12.72	Φ, deg	7.3
Test 3	21.75	61.74	39.99	3.81	50.87	10.88	C, psi	4.4

Calculations based on: Test 1 Test 3

Note: The Friction Angle and Cohesion using other combinations of test points may yield a higher or lower value than the one reported above.



CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
		Lab Sample No.	42506002
USCS Description:	VERY DARK BROWN SILTY SAND		
Test Conditions:	Undisturbed - Side And Double Drained		

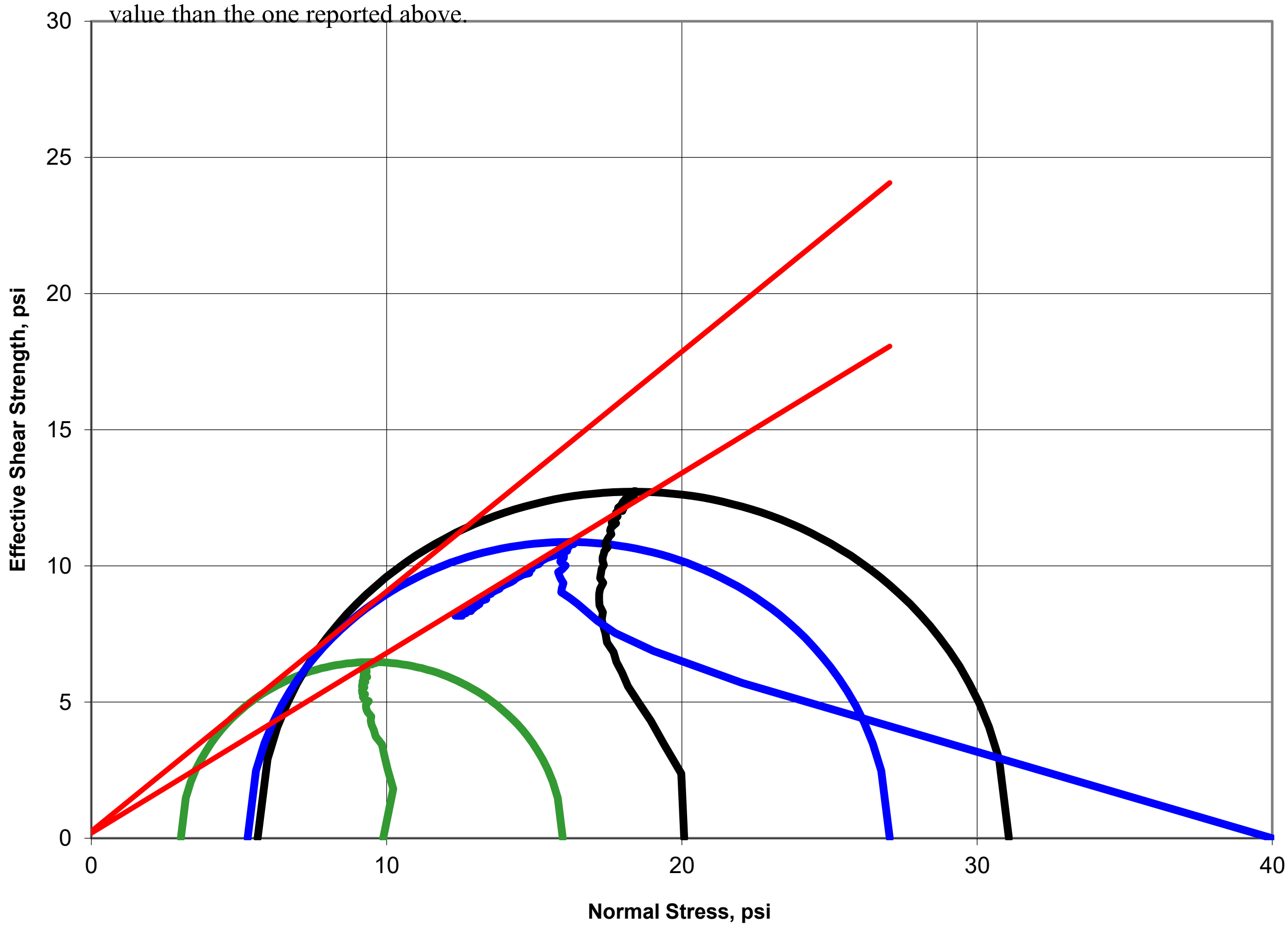
EFFECTIVE STRESS

FAILURE CONDITION: MAX. EFFECTIVE PRINCIPAL STRESS RATIO

Test No.	Deviator Stress	Major Principal Stress	Minor Principal Stress	Strain at Failure	Mohr's Circle Stress Path		Failure Angle	
	$\sigma 1-\sigma 3$	$\sigma '1$	$\sigma '3$	ε	p'	q		
	psi	psi	psi	%	psi	psi	α', deg	33.5
Test 1	12.94	15.97	3.03	10.50	9.50	6.47	a', psi	0.2
Test 2	25.45	31.08	5.63	8.00	18.36	12.72	Φ', deg	41.4
Test 3	21.75	27.04	5.29	3.81	16.17	10.88	C', psi	0.3

Calculations based on: Test 1 Test 3

Note: The Friction Angle and Cohesion using other combinations of test points may yield a higher or lower value than the one reported above.



CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
Test No.	1	Lab Sample No.	42506002
USCS Description:	VERY DARK BROWN SILTY SAND	Test Conditions:	Undisturbed - Side And Double Drained

SAMPLE CONDITIONS

	Initial	After Consol.	Final
Tare Number	912	NA	206
Wt. Tare & WS, gm	796.23	NA	1141.96
Wt. Tare & DS, gm	647.70	NA	868.21
Wt. Tare, gm	187.09	NA	179.51
Water Content, %	32.2	39.7	39.7
Wt. Tube & WS., gm	1404.1	NA	
Wt. Of Tube, gm	429.8	NA	
Wt. Of WS., gm	974.4	1029.6	
Length 1, in	5.958	NA	
Length 2, in	5.969	NA	
Length 3, in	5.956	NA	
Top Diameter, in	2.844	NA	
Middle Diameter, in	2.864	NA	
Bottom Diameter, in	2.883	NA	
Average Length, in	5.961	5.764	
Average Diameter, in	2.864	2.759	
Average Area, in^2	6.44	5.98	
Sample Volume, in^3	38.39	38.13	
Unit Dry Wt., gms/cc	1.17	1.18	
Unit Dry Wt., pcf	73.1	73.6	
Specific Gravity, Assume	2.70	2.70	
Volume of Solids, cc	272.88		
Void Ratio, e	1.31		
Porosity, n	0.57		
Pore Volume, cc	356.27		
Saturation, %	66.7		

TEST CONDITIONS

Cell Pressure, psi	100.26	
Back Pressure, psi	90.37	
Effective Consolidating Pressure, psi	9.88	σ_3
Pore Pressure Parameter (B), %	1	

SATURATION AND CONSOLIDATION VOLUME CHANGES

Height Change, mils	Reading	Change	Consolidation	
Initial Reading	6.804	0	Volume Change, ml	4.4
After Saturation	6.614	190	Volume Change, in^3	0.27
After Consolidation	6.607	197	Saturation Method:	Wet

STRAIN RATE CALCULATIONS

Calc. Strain Rate, %/min (t50=.30)	0.01333	Strain Rate Used, %/min	0.00004
Calc. Deformation Rate, in/min	0.07685	Deformation Rate Used	0.00024

EFFECTIVE FAILURE SUMMARY

Failure Conditions	*Max σ_1'/σ_3'*	*15% ε*	
Effective Consolidating Pressure, psi	9.88	9.88	σ_3
Maximum Effective Principal Stress Ratio	5.266	5.12	σ_1'/σ_3'
Deviator Stress at Failure, psi	12.94	12.82	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	10.50	15.00	ε
Effective Minor Principal Stress at Failure, psi	3.03	3.11	σ_3'
Effective Major Principal Stress at Failure, psi	15.97	15.92	σ_1'
Mohr's Circle Stress Path (Origin of Circle), psi	9.50	9.52	p'
Mohr's Circle Stress Path (Radius of Circle), psi	6.47	6.41	q

TOTAL FAILURE SUMMARY

Failure Conditions	*Max σ_1'/σ_3'*	*15% ε*	
Deviator Stress at Failure, psi	12.94	12.82	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	10.50	15.00	ε
Total Minor Principal Stress at Failure, psi	9.88	9.88	σ_3
Total Major Principal Stress at Failure, psi	22.82	22.70	σ_1

TEST DATA

Axial Load	Axial Deformation	Total Pore Water Pressure	Axial Strain	Principal Stress Difference (Deviator Stress)	Induced Pore Water Pressure	Effective Major Principal Stress	Effective Minor Principal Stress	Effective Principal Stress Ratio	A-Bar	Mohr's Circle Stress Paths Origin of Circle	Mohr's Circle Stress Paths Radius of Circle
lb.	mils	psi	%	psi	psi	psi	psi			psi	psi
P	ΔH	U	ε	$\sigma_1-\sigma_3$	ΔU	σ_1'	σ_3'	σ_1'/σ_3'	A'	p'	q
18.0	0	90.4	0	0	NA	NA	NA	NA	NA	9.88	0
39.7	6	91.8	0.11	3.62	1.47	12.04	8.41	1.431	42.18	10.23	1.81
48.4	12	92.8	0.21	5.08	2.39	12.57	7.49	1.677	48.99	10.03	2.54
54.8	18	93.4	0.30	6.13	3.03	12.98	6.85	1.895	51.50	9.92	3.07
59.3	23	93.9	0.40	6.88	3.48	13.29	6.40	2.075	52.65	9.84	3.44
62.8	29	94.4	0.50	7.47	3.98	13.37	5.90	2.265	55.53	9.64	3.73
65.8	35	94.7	0.60	7.95	4.29	13.55	5.60	2.422	56.15	9.57	3.98
68.1	41	94.9	0.70	8.32	4.54	13.66	5.34	2.558	56.89	9.50	4.16
70.0	46	95.1	0.80	8.63	4.74	13.78	5.14	2.679	57.20	9.46	4.32
71.9	52	95.2	0.90	8.94	4.86	13.95	5.02	2.781	56.70	9.49	4.47
73.8	58	95.5	1.00	9.25	5.14	13.99	4.75	2.948	57.87	9.37	4.62
74.9	64	95.6	1.10	9.42	5.27	14.03	4.61	3.045	58.28	9.32	4.71
76.3	69	95.8	1.20	9.64	5.40	14.12	4.49	3.148	58.34	9.30	4.82
77.4	75	95.9	1.30	9.81	5.48	14.21	4.40	3.229	58.24	9.30	4.90
79.0	81	95.9	1.40	10.07	5.51	14.44	4.37	3.305	57.05	9.40	5.03
79.8	87	96.1	1.50	10.18	5.72	14.35	4.16	3.445	58.50	9.25	5.09
80.5	92	96.2	1.60	10.29	5.81	14.37	4.07	3.528	58.79	9.22	5.15
81.2	98	96.2	1.70	10.39	5.88	14.40	4.01	3.593	58.91	9.20	5.19
82.4	104	96.3	1.80	10.58	5.90	14.56	3.99	3.654	58.07	9.27	5.29
83.0	110	96.4	1.90	10.66	6.03	14.51	3.85	3.771	58.94	9.18	5.33
83.7	116	96.5	2.00	10.77	6.08	14.57	3.80	3.833	58.85	9.18	5.38
84.2	121	96.5	2.10	10.85	6.14	14.59	3.74	3.900	58.95	9.17	5.43
85.0	127	96.5	2.20	10.97	6.17	14.69	3.72	3.951	58.55	9.20	5.48
85.8	133	96.5	2.30	11.08	6.17	14.79	3.71	3.985	58.02	9.25	5.54
86.3	139	96.7	2.40	11.16	6.30	14.74	3.59	4.111	58.77	9.17	5.58
87.0	144	96.7	2.50	11.26	6.32	14.82	3.56	4.160	58.48	9.19	5.63
87.2	150	96.7	2.60	11.28	6.35	14.82	3.53	4.193	58.61	9.18	5.64
88.0	156	96.7	2.70	11.40	6.37	14.92	3.52	4.243	58.15	9.22	5.70
88.5	162	96.7	2.80	11.47	6.34	15.01	3.54	4.240	57.57	9.28	5.74
88.9	167	96.8	2.90	11.52	6.46	14.94	3.42	4.369	58.41	9.18	5.76
89.5	173	96.9	3.00	11.61	6.48	15.01	3.41	4.409	58.12	9.21	5.80
90.0	179	96.9	3.10	11.67	6.50	15.06	3.39	4.448	57.98	9.22	5.84
90.4	185	96.9	3.20	11.72	6.50	15.11	3.38	4.467	57.75	9.24	5.86
91.2	190	96.8	3.30	11.84	6.46	15.27	3.42	4.462	56.82	9.34	5.92
91.2	196	97.0	3.40	11.83	6.58	15.13	3.30	4.588	57.96	9.22	5.92
91.7	202	97.0	3.50	11.91	6.61	15.18	3.28	4.635	57.81	9.23	5.95

92.2	208	97.0	3.60	11.98	6.61	15.25	3.27	4.661	57.50	9.26	5.99
92.3	214	97.0	3.70	11.97	6.60	15.26	3.28	4.647	57.41	9.27	5.99
92.8	219	97.0	3.80	12.04	6.65	15.27	3.24	4.719	57.50	9.26	6.02
93.2	225	97.0	3.90	12.10	6.66	15.32	3.22	4.759	57.37	9.27	6.05
94.0	231	97.1	4.00	12.20	6.69	15.40	3.19	4.820	57.10	9.29	6.10
93.7	237	97.1	4.10	12.15	6.69	15.34	3.19	4.811	57.36	9.27	6.08
94.1	242	97.0	4.20	12.20	6.66	15.42	3.22	4.788	56.88	9.32	6.10
94.0	248	97.1	4.30	12.16	6.75	15.30	3.14	4.880	57.78	9.22	6.08
94.3	254	97.1	4.40	12.20	6.74	15.35	3.15	4.879	57.50	9.25	6.10
94.5	260	97.1	4.50	12.22	6.75	15.35	3.13	4.908	57.56	9.24	6.11
94.8	265	97.1	4.60	12.26	6.75	15.39	3.13	4.912	57.35	9.26	6.13
95.2	271	97.1	4.70	12.31	6.72	15.48	3.17	4.889	56.83	9.32	6.16
95.5	277	97.2	4.80	12.35	6.80	15.44	3.09	5.003	57.33	9.26	6.17
95.4	283	97.2	4.90	12.31	6.80	15.40	3.08	4.992	57.51	9.24	6.16
95.8	288	97.2	5.00	12.37	6.78	15.47	3.10	4.993	57.10	9.29	6.19
96.4	303	97.2	5.25	12.43	6.81	15.51	3.07	5.049	57.06	9.29	6.22
97.0	317	97.2	5.50	12.49	6.83	15.54	3.05	5.088	56.95	9.30	6.24
97.4	332	97.2	5.75	12.53	6.84	15.58	3.05	5.112	56.83	9.31	6.26
97.9	346	97.2	6.00	12.57	6.84	15.60	3.04	5.135	56.73	9.32	6.28
98.3	360	97.2	6.25	12.60	6.85	15.63	3.03	5.152	56.63	9.33	6.30
98.9	375	97.2	6.50	12.65	6.86	15.67	3.03	5.181	56.47	9.35	6.32
99.2	389	97.2	6.75	12.67	6.85	15.69	3.03	5.182	56.37	9.36	6.33
99.6	404	97.2	7.00	12.69	6.86	15.72	3.02	5.197	56.27	9.37	6.35
100.0	418	97.2	7.25	12.73	6.86	15.75	3.02	5.210	56.13	9.39	6.36
100.1	432	97.2	7.50	12.71	6.86	15.73	3.02	5.209	56.23	9.38	6.36
100.6	447	97.2	7.75	12.75	6.86	15.77	3.02	5.218	56.06	9.40	6.37
100.9	461	97.2	8.00	12.75	6.87	15.77	3.02	5.229	56.08	9.39	6.38
101.0	476	97.2	8.25	12.74	6.86	15.76	3.02	5.216	56.12	9.39	6.37
101.6	490	97.2	8.50	12.80	6.86	15.82	3.02	5.240	55.82	9.42	6.40
101.8	505	97.2	8.75	12.79	6.87	15.80	3.01	5.249	55.98	9.40	6.39
102.4	519	97.2	9.00	12.85	6.86	15.87	3.02	5.260	55.64	9.44	6.43
102.4	533	97.2	9.25	12.82	6.86	15.85	3.03	5.237	55.70	9.44	6.41
103.0	548	97.2	9.50	12.86	6.85	15.90	3.04	5.238	55.45	9.47	6.43
103.2	562	97.2	9.75	12.87	6.86	15.90	3.03	5.255	55.49	9.46	6.44
103.7	577	97.2	10.00	12.91	6.85	15.94	3.03	5.255	55.26	9.49	6.45
103.8	591	97.2	10.25	12.89	6.85	15.92	3.03	5.246	55.36	9.48	6.44
104.4	605	97.2	10.50	12.94	6.85	15.97	3.03	5.266	55.16	9.50	6.47
104.2	620	97.2	10.75	12.87	6.85	15.91	3.03	5.244	55.43	9.47	6.44
104.4	634	97.2	11.00	12.87	6.85	15.91	3.04	5.239	55.40	9.47	6.44
105.2	649	97.2	11.25	12.95	6.84	15.98	3.04	5.259	55.06	9.51	6.47
105.1	663	97.2	11.50	12.90	6.84	15.94	3.04	5.244	55.25	9.49	6.45
105.3	677	97.2	11.75	12.88	6.83	15.94	3.05	5.219	55.20	9.50	6.44
105.3	692	97.2	12.00	12.86	6.83	15.91	3.05	5.220	55.36	9.48	6.43
106.1	706	97.2	12.25	12.93	6.83	15.98	3.05	5.234	55.02	9.52	6.46
105.5	721	97.2	12.50	12.82	6.83	15.86	3.05	5.203	55.54	9.46	6.41
106.3	735	97.2	12.75	12.90	6.83	15.95	3.06	5.218	55.13	9.51	6.45
106.1	749	97.2	13.00	12.83	6.82	15.89	3.06	5.191	55.39	9.48	6.41
106.8	764	97.2	13.25	12.90	6.79	15.98	3.09	5.177	54.88	9.54	6.45
106.7	778	97.2	13.50	12.83	6.78	15.94	3.10	5.136	55.03	9.52	6.42
107.7	793	97.1	13.75	12.94	6.76	16.06	3.12	5.148	54.45	9.59	6.47
107.6	807	97.1	14.00	12.90	6.74	16.04	3.14	5.103	54.42	9.59	6.45
107.8	821	97.1	14.25	12.89	6.72	16.05	3.16	5.073	54.30	9.61	6.44
107.9	836	97.1	14.50	12.86	6.69	16.05	3.19	5.034	54.24	9.62	6.43
108.3	850	97.1	14.75	12.87	6.70	16.06	3.18	5.047	54.21	9.62	6.44
108.1	865	97.1	15.00	12.82	6.77	15.92	3.11	5.122	55.05	9.52	6.41
108.4	879	97.1	15.25	12.82	6.77	15.94	3.11	5.118	54.98	9.53	6.41
108.3	893	97.1	15.50	12.77	6.76	15.89	3.12	5.090	55.17	9.50	6.38
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40
108.6	894	97.1	15.51	12.80	6.76	15.93	3.13	5.096	54.98	9.53	6.40

Performed By: ALO   Inputalidation: MAK   Reviewed By: ALO   Date Tested: 10/11/2019

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
Test No.	2	Lab Sample No.	42506002
USCS Description:	VERY DARK BROWN SILTY SAND	Test Conditions:	Undisturbed - Side And Double Drained

SAMPLE CONDITIONS

	Initial	After Consol.	Final
Tare Number	912	NA	887
Wt. Tare & WS, gm	796.23	NA	1223.25
Wt. Tare & DS, gm	647.7	NA	918.95
Wt. Tare, gm	187.09	NA	187.34
Water Content, %	32.2	41.6	41.6
Wt. Tube & WS., gm	1488.9	NA	
Wt. Of Tube, gm	439.5	NA	
Wt. Of WS., gm	1049.5	1123.6	
Length 1, in	6.107	NA	
Length 2, in	6.063	NA	
Length 3, in	6.097	NA	
Top Diameter, in	2.864	NA	
Middle Diameter, in	2.87	NA	
Bottom Diameter, in	2.859	NA	
Average Length, in	6.089	5.957	
Average Diameter, in	2.864	2.796	
Average Area, in^2	6.44	6.14	
Sample Volume, in^3	39.24	38.20	
Unit Dry Wt., gms/cc	1.23	1.27	
Unit Dry Wt., pcf	77.0	79.1	
Specific Gravity, Assume	2.70	2.70	
Volume of Solids, cc	293.91		
Void Ratio, e	1.19		
Porosity, n	0.54		
Pore Volume, cc	349.05		
Saturation, %	73.3		

TEST CONDITIONS

Cell Pressure, psi	110.42	
Back Pressure, psi	90.33	
Effective Consolidating Pressure, psi	20.08	$\sigma 3$
Pore Pressure Parameter (B), %	1	

SATURATION AND CONSOLIDATION VOLUME CHANGES

Height Change, mils	Reading	Change	Consolidation	
Initial Dial Reading	7.634	0	Volume Change, ml	17.0
After Saturation	7.55	84	Volume Change, in^3	1.04
After Consolidation	7.502	132	Saturation Method:	Wet

STRAIN RATE CALCULATIONS

Calc. Strain Rate, %/min (t50=1.36)	0.00294	Strain Rate Used, %/min	0.00004
Calc. Deformation Rate, in/min	0.01752	Deformation Rate Used	0.00025

EFFECTIVE FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Effective Consolidating Pressure, psi	20.08	20.08	σ_3
Maximum Effective Principal Stress Ratio	5.518	5.09	σ_1'/σ_3'
Deviator Stress at Failure, psi	25.45	24.19	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	8.00	15.00	ε
Effective Minor Principal Stress at Failure, psi	5.63	5.91	σ_3'
Effective Major Principal Stress at Failure, psi	31.08	30.11	σ_1'
Mohr's Circle Stress Path (Origin of Circle), psi	18.36	18.01	p'
Mohr's Circle Stress Path (Radius of Circle), psi	12.72	12.10	q

TOTAL FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Deviator Stress at Failure, psi	25.45	24.19	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	8.00	15.00	ε
Total Minor Principal Stress at Failure, psi	20.08	20.08	σ_3
Total Major Principal Stress at Failure, psi	45.53	44.27	σ_1

TEST DATA

Axial Load	Axial Deformation	Total Pore Water Pressure	Axial Strain	Principal Stress Difference (Deviator Stress)	Induced Pore Water Pressure	Effective Major Principal Stress	Effective Minor Principal Stress	Effective Principal Stress Ratio	A-Bar	Mohr's Circle Stress Paths: Origin of Circle	Mohr's Circle Stress Paths: Radius of Circle
lb.	mils	psi	%	psi	psi	psi	psi			psi	psi
P	ΔH	U	ε	$\sigma_1-\sigma_3$	ΔU	σ_1'	σ_3'	σ_1'/σ_3'	A'	p'	q
24.9	0	90.3	0	0.00	0	NA	NA	NA	NA	20.08	0
54.1	6	92.8	0.10	4.74	2.47	22.36	17.62	1.269	53.06	19.99	2.37
67.6	12	94.5	0.20	6.93	4.16	22.85	15.92	1.435	61.29	19.38	3.47
78.0	18	95.8	0.30	8.61	5.44	23.26	14.65	1.588	64.41	18.95	4.31
87.1	24	97.0	0.40	10.09	6.63	23.54	13.45	1.750	67.02	18.50	5.05
93.8	30	97.8	0.50	11.16	7.48	23.76	12.60	1.886	68.40	18.18	5.58
100.1	36	98.5	0.60	12.17	8.19	24.07	11.89	2.023	68.64	17.98	6.09
104.9	42	99.1	0.70	12.94	8.77	24.25	11.32	2.143	69.13	17.79	6.47
109.6	48	99.6	0.80	13.68	9.23	24.53	10.85	2.260	68.87	17.69	6.84
114.1	54	100.1	0.90	14.38	9.80	24.66	10.28	2.399	69.54	17.47	7.19
118.3	60	100.5	1.00	15.05	10.20	24.93	9.88	2.523	69.14	17.41	7.52
121.8	66	100.9	1.10	15.61	10.54	25.15	9.54	2.636	68.92	17.34	7.80
124.8	71	101.2	1.20	16.07	10.83	25.32	9.25	2.737	68.77	17.29	8.03
128.2	77	101.4	1.30	16.60	11.05	25.63	9.03	2.837	67.94	17.33	8.30
131.4	83	101.8	1.40	17.10	11.42	25.76	8.66	2.975	68.15	17.21	8.55
134.3	89	102.0	1.50	17.54	11.65	25.97	8.43	3.081	67.79	17.20	8.77
136.9	95	102.2	1.60	17.95	11.85	26.18	8.23	3.181	67.39	17.20	8.97
139.4	101	102.3	1.70	18.33	12.01	26.40	8.07	3.271	66.86	17.24	9.16
142.2	107	102.5	1.80	18.75	12.12	26.71	7.96	3.356	65.95	17.34	9.38
144.6	113	102.7	1.90	19.11	12.41	26.78	7.67	3.491	66.26	17.23	9.56
147.1	119	102.9	2.00	19.49	12.57	27.01	7.51	3.594	65.79	17.26	9.75
149.0	125	103.0	2.10	19.78	12.69	27.17	7.39	3.676	65.45	17.28	9.89
150.9	131	103.1	2.20	20.06	12.75	27.39	7.33	3.737	64.86	17.36	10.03
153.0	137	103.3	2.30	20.38	12.95	27.50	7.13	3.858	64.87	17.32	10.19
154.7	143	103.4	2.40	20.63	13.07	27.64	7.01	3.943	64.67	17.32	10.31
156.6	149	103.5	2.50	20.91	13.17	27.81	6.91	4.026	64.30	17.36	10.45
157.7	155	103.6	2.60	21.06	13.24	27.90	6.84	4.078	64.16	17.37	10.53
159.7	161	103.6	2.70	21.35	13.27	28.17	6.82	4.133	63.40	17.49	10.68
161.3	167	103.8	2.80	21.59	13.47	28.20	6.61	4.265	63.66	17.41	10.79
162.7	173	103.9	2.90	21.79	13.53	28.34	6.55	4.325	63.35	17.45	10.90
164.2	179	103.9	3.00	22.00	13.59	28.50	6.49	4.389	63.01	17.50	11.00
165.7	185	104.0	3.10	22.21	13.63	28.67	6.46	4.440	62.60	17.56	11.10
166.6	191	104.0	3.20	22.33	13.63	28.78	6.45	4.461	62.30	17.61	11.16
168.4	197	104.1	3.30	22.59	13.80	28.87	6.28	4.597	62.34	17.58	11.30
169.2	203	104.2	3.40	22.70	13.85	28.93	6.24	4.640	62.25	17.58	11.35

170.1	209	104.2	3.50	22.82	13.88	29.02	6.20	4.680	62.08	17.61	11.41
171.8	215	104.2	3.60	23.05	13.89	29.25	6.20	4.721	61.47	17.72	11.52
172.4	220	104.2	3.70	23.13	13.87	29.34	6.21	4.725	61.21	17.77	11.56
172.9	226	104.4	3.80	23.18	14.04	29.22	6.04	4.839	61.81	17.63	11.59
174.7	232	104.4	3.90	23.43	14.07	29.44	6.01	4.898	61.27	17.73	11.72
174.7	238	104.4	4.00	23.42	14.10	29.40	5.98	4.914	61.43	17.69	11.71
175.9	244	104.4	4.10	23.58	14.07	29.59	6.01	4.922	60.90	17.80	11.79
176.5	250	104.4	4.20	23.64	14.08	29.64	6.00	4.938	60.77	17.82	11.82
177.6	256	104.6	4.30	23.79	14.23	29.64	5.86	5.062	61.03	17.75	11.89
178.4	262	104.6	4.40	23.89	14.25	29.72	5.84	5.093	60.85	17.78	11.94
178.7	268	104.6	4.50	23.91	14.26	29.73	5.82	5.108	60.86	17.78	11.96
179.5	274	104.6	4.60	24.02	14.22	29.88	5.86	5.098	60.42	17.87	12.01
180.5	280	104.6	4.70	24.15	14.25	29.99	5.84	5.138	60.19	17.91	12.08
181.2	286	104.7	4.80	24.22	14.36	29.94	5.72	5.232	60.49	17.83	12.11
181.7	292	104.7	4.90	24.28	14.37	29.99	5.71	5.251	60.40	17.85	12.14
182.5	298	104.7	5.00	24.37	14.36	30.10	5.72	5.258	60.11	17.91	12.19
184.2	313	104.7	5.25	24.57	14.39	30.26	5.69	5.319	59.78	17.97	12.28
185.3	328	104.8	5.50	24.68	14.42	30.34	5.66	5.358	59.62	18.00	12.34
186.9	343	104.8	5.75	24.86	14.43	30.50	5.65	5.402	59.26	18.07	12.43
188.1	357	104.8	6.00	24.98	14.45	30.61	5.63	5.436	59.03	18.12	12.49
188.8	372	104.8	6.25	25.02	14.46	30.64	5.62	5.451	58.99	18.13	12.51
190.3	387	104.8	6.50	25.18	14.46	30.81	5.63	5.476	58.57	18.22	12.59
191.3	402	104.8	6.75	25.27	14.46	30.89	5.62	5.493	58.38	18.26	12.63
191.9	417	104.8	7.00	25.29	14.46	30.91	5.62	5.496	58.35	18.27	12.64
192.7	432	104.8	7.25	25.34	14.46	30.97	5.63	5.504	58.20	18.30	12.67
193.6	447	104.8	7.50	25.41	14.45	31.04	5.63	5.512	58.04	18.33	12.70
194.3	462	104.8	7.75	25.44	14.45	31.08	5.64	5.514	57.93	18.36	12.72
194.8	477	104.8	8.00	25.45	14.45	31.08	5.63	5.518	57.94	18.36	12.72
195.1	492	104.8	8.25	25.43	14.45	31.07	5.64	5.513	57.96	18.35	12.72
196.0	506	104.8	8.50	25.49	14.44	31.14	5.64	5.516	57.79	18.39	12.75
196.3	521	104.8	8.75	25.46	14.43	31.11	5.65	5.503	57.83	18.38	12.73
196.8	536	104.7	9.00	25.48	14.41	31.15	5.67	5.494	57.73	18.41	12.74
197.1	551	104.7	9.25	25.44	14.40	31.12	5.68	5.479	57.77	18.40	12.72
197.7	566	104.7	9.50	25.47	14.38	31.17	5.70	5.466	57.62	18.43	12.73
198.4	581	104.7	9.75	25.49	14.38	31.19	5.70	5.472	57.56	18.45	12.75
198.5	596	104.7	10.00	25.44	14.37	31.15	5.71	5.454	57.64	18.43	12.72
198.9	611	104.7	10.25	25.42	14.36	31.15	5.72	5.442	57.63	18.43	12.71
198.9	626	104.7	10.50	25.35	14.35	31.09	5.74	5.420	57.75	18.41	12.68
199.3	641	104.7	10.75	25.34	14.33	31.09	5.75	5.405	57.71	18.42	12.67
199.1	655	104.6	11.00	25.24	14.31	31.01	5.77	5.376	57.87	18.39	12.62
199.3	670	104.6	11.25	25.20	14.29	30.99	5.79	5.350	57.86	18.39	12.60
199.3	685	104.6	11.50	25.13	14.28	30.93	5.80	5.335	58.00	18.36	12.57
199.4	700	104.6	11.75	25.07	14.25	30.90	5.83	5.301	58.00	18.37	12.54
199.2	715	104.6	12.00	24.97	14.25	30.81	5.84	5.279	58.21	18.32	12.49
199.9	730	104.6	12.25	25.00	14.23	30.85	5.85	5.272	58.07	18.35	12.50
199.9	745	104.6	12.50	24.93	14.23	30.79	5.86	5.257	58.23	18.32	12.46
200.4	760	104.5	12.75	24.94	14.21	30.81	5.87	5.246	58.14	18.34	12.47
200.3	775	104.5	13.00	24.85	14.19	30.74	5.89	5.218	58.26	18.32	12.43
201.0	789	104.5	13.25	24.87	14.16	30.80	5.92	5.198	58.08	18.36	12.44
200.3	804	104.5	13.50	24.71	14.15	30.64	5.93	5.165	58.43	18.29	12.35
201.0	819	104.5	13.75	24.73	14.13	30.68	5.95	5.158	58.31	18.32	12.37
201.3	834	104.6	14.00	24.70	14.29	30.49	5.79	5.264	59.03	18.14	12.35
200.6	849	104.6	14.25	24.53	14.26	30.36	5.83	5.212	59.29	18.09	12.27
200.6	864	104.6	14.50	24.45	14.25	30.28	5.83	5.196	59.48	18.05	12.23
200.4	879	104.5	14.75	24.36	14.20	30.24	5.88	5.141	59.48	18.06	12.18
199.7	894	104.5	15.00	24.19	14.17	30.11	5.91	5.090	59.76	18.01	12.10
199.8	909	104.5	15.25	24.13	14.14	30.07	5.94	5.064	59.80	18.00	12.07
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01
199.5	923	104.4	15.50	24.02	14.11	30.00	5.97	5.022	59.93	17.98	12.01

Performed By: ALO   Input Validation: MAK   Reviewed By: ALO   Date Tested: 10/11/2019

CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST ON COHESIVE SOILS ASTM D4767-11

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
Test No.	3	Lab Sample No.	42506002
USCS Description:	VERY DARK BROWN SILTY SAND	Test Conditions:	Undisturbed - Side And Double Drained

SAMPLE CONDITIONS

	Initial	After Consol.	Final
Tare Number	912	NA	208
Wt. Tare & WS, gm	796.23	NA	1204.16
Wt. Tare & DS, gm	647.7	NA	902.48
Wt. Tare, gm	187.09	NA	17.00
Water Content, %	32.2	34.1	34.1
Wt. Tube & WS., gm	1472.2	NA	
Wt. Of Tube, gm	431.4	NA	
Wt. Of WS., gm	1040.8	1055.1	
Length 1, in	5.98	NA	
Length 2, in	6.028	NA	
Length 3, in	5.991	NA	
Top Diameter, in	2.856	NA	
Middle Diameter, in	2.849	NA	
Bottom Diameter, in	2.866	NA	
Average Length, in	6.000	5.899	
Average Diameter, in	2.857	2.801	
Average Area, in^2	6.41	6.16	
Sample Volume, in^3	38.46	37.02	
Unit Dry Wt., gms/cc	1.25	1.30	
Unit Dry Wt., pcf	77.9	80.9	
Specific Gravity, Assume	2.70	2.70	
Volume of Solids, cc	291.48		
Void Ratio, e	1.16		
Porosity, n	0.54		
Pore Volume, cc	338.80		
Saturation, %	74.9		

TEST CONDITIONS

Cell Pressure, psi	110.31	
Back Pressure, psi	70.32	
Effective Consolidating Pressure, psi	39.99	$\sigma 3$
Pore Pressure Parameter (B), %	1	

SATURATION AND CONSOLIDATION VOLUME CHANGES

Height Change, mils	Reading	Change	Consolidation	
Initial Dial Reading	7.321	0	Volume Change, ml	23.6
After Saturation	7.286	35	Volume Change, in^3	1.44
After Consolidation	7.22	101	Saturation Method:	Wet

STRAIN RATE CALCULATIONS

Calc. Strain Rate, %/min (t50=.80)	0.00500	Strain Rate Used, %/min	0.00004
Calc. Deformation Rate, in/min	0.02949	Deformation Rate Used	0.00025

EFFECTIVE FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Effective Consolidating Pressure, psi	39.99	39.99	σ_3
Maximum Effective Principal Stress Ratio	5.109	4.82	σ_1'/σ_3'
Deviator Stress at Failure, psi	21.75	16.45	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	3.81	15.00	ε
Effective Minor Principal Stress at Failure, psi	5.29	4.31	σ_3'
Effective Major Principal Stress at Failure, psi	27.04	20.76	σ_1'
Mohr's Circle Stress Path (Origin of Circle), psi	16.17	12.53	p'
Mohr's Circle Stress Path (Radius of Circle), psi	10.88	8.23	q

TOTAL FAILURE SUMMARY

Failure Conditions	Max σ_1'/σ_3'	15% ε	
Deviator Stress at Failure, psi	21.75	16.45	$\sigma_1-\sigma_3$
Axial Strain at Failure, %	3.81	15.00	ε
Total Minor Principal Stress at Failure, psi	39.99	39.99	σ_3
Total Major Principal Stress at Failure, psi	61.74	56.44	σ_1

TEST DATA

Axial Load	Axial Deformation	Total Pore Water Pressure	Axial Strain	Principal Stress Difference (Deviator Stress)	Induced Pore Water Pressure	Effective Major Principal Stress	Effective Minor Principal Stress	Effective Principal Stress Ratio	A-Bar	Mohr's Circle Stress Paths: Origin of Circle	Mohr's Circle Stress Paths: Radius of Circle
lb.	mils	psi	%	psi	psi	psi	psi			psi	psi
P	ΔH	U	ε	$\sigma_1-\sigma_3$	ΔU	σ_1'	σ_3'	σ_1'/σ_3'	A'	p'	q
22.5	0	70.3	0	0	0	NA	NA	NA	NA	39.99	0
92.9	6	94.0	0.11	11.42	23.66	27.75	16.33	1.699	209.31	22.04	5.71
107.5	12	98.2	0.21	13.76	27.84	25.92	12.16	2.132	204.35	19.04	6.88
115.7	18	100.1	0.31	15.07	29.79	25.28	10.21	2.477	199.62	17.74	7.54
121.2	24	101.2	0.41	15.96	30.83	25.12	9.16	2.742	195.18	17.14	7.98
125.8	30	101.9	0.51	16.67	31.58	25.09	8.42	2.981	191.31	16.75	8.34
129.2	36	102.4	0.61	17.21	32.13	25.07	7.87	3.188	188.58	16.47	8.60
132.1	42	102.9	0.71	17.66	32.62	25.03	7.37	3.396	186.57	16.20	8.83
134.7	48	103.4	0.81	18.06	33.11	24.94	6.88	3.623	185.20	15.91	9.03
136.7	53	103.5	0.91	18.36	33.23	25.12	6.76	3.716	182.86	15.94	9.18
139.1	59	103.7	1.01	18.74	33.37	25.36	6.63	3.828	179.87	16.00	9.37
141.1	65	103.9	1.11	19.03	33.60	25.42	6.39	3.977	178.36	15.91	9.51
142.8	71	104.1	1.21	19.29	33.79	25.50	6.21	4.108	176.88	15.85	9.65
144.5	77	104.3	1.31	19.54	33.96	25.58	6.04	4.237	175.50	15.81	9.77
146.0	83	104.2	1.41	19.75	33.92	25.82	6.07	4.255	173.48	15.94	9.88
147.8	89	104.3	1.51	20.02	33.94	26.07	6.05	4.308	171.23	16.06	10.01
148.9	95	104.5	1.61	20.19	34.14	26.04	5.85	4.450	170.80	15.95	10.10
149.9	101	104.6	1.71	20.32	34.26	26.05	5.73	4.546	170.33	15.89	10.16
151.1	107	104.6	1.81	20.50	34.32	26.17	5.67	4.613	169.13	15.92	10.25
151.8	112	104.6	1.91	20.58	34.27	26.29	5.72	4.598	168.26	16.01	10.29
152.8	118	104.7	2.01	20.72	34.35	26.37	5.65	4.671	167.41	16.01	10.36
153.7	124	104.8	2.11	20.84	34.46	26.37	5.53	4.770	167.03	15.95	10.42
154.7	130	104.9	2.21	20.97	34.54	26.42	5.45	4.849	166.38	15.93	10.49
155.7	136	104.8	2.31	21.12	34.43	26.67	5.56	4.799	164.72	16.12	10.56
156.0	142	104.8	2.41	21.15	34.45	26.69	5.54	4.818	164.55	16.11	10.57
156.8	148	104.9	2.51	21.24	34.57	26.66	5.42	4.919	164.41	16.04	10.62
157.3	154	104.9	2.61	21.30	34.58	26.72	5.42	4.933	163.93	16.07	10.65
157.8	160	104.8	2.71	21.37	34.52	26.84	5.47	4.905	163.18	16.16	10.68
158.6	166	104.9	2.81	21.46	34.53	26.92	5.46	4.931	162.56	16.19	10.73
159.0	172	105.0	2.91	21.51	34.65	26.86	5.35	5.024	162.68	16.10	10.76
160.0	177	104.8	3.01	21.64	34.51	27.12	5.48	4.950	161.12	16.30	10.82
159.8	183	104.8	3.11	21.60	34.46	27.12	5.53	4.906	161.20	16.33	10.80
160.4	189	105.0	3.21	21.65	34.66	26.99	5.33	5.061	161.68	16.16	10.83
160.7	195	104.8	3.31	21.69	34.51	27.17	5.48	4.957	160.70	16.33	10.85
161.0	201	104.9	3.41	21.70	34.57	27.12	5.42	5.005	160.92	16.27	10.85
161.5	207	104.9	3.51	21.77	34.61	27.15	5.39	5.042	160.59	16.27	10.88

161.1	213	104.8	3.61	21.68	34.46	27.22	5.53	4.918	160.53	16.37	10.84
161.6	219	105.0	3.71	21.73	34.69	27.04	5.31	5.096	161.23	16.17	10.87
161.8	225	105.0	3.81	21.75	34.70	27.04	5.29	5.109	161.15	16.17	10.88
161.9	231	104.9	3.91	21.74	34.56	27.17	5.43	5.005	160.59	16.30	10.87
162.2	236	105.0	4.01	21.77	34.65	27.11	5.34	5.073	160.78	16.23	10.88
162.0	242	105.0	4.11	21.71	34.64	27.06	5.35	5.058	161.19	16.20	10.85
162.1	248	105.0	4.21	21.71	34.64	27.06	5.35	5.055	161.18	16.21	10.85
161.9	254	105.0	4.31	21.65	34.71	26.93	5.28	5.101	161.93	16.11	10.83
162.1	260	104.9	4.41	21.65	34.60	27.04	5.40	5.012	161.43	16.22	10.82
162.2	266	105.0	4.51	21.65	34.64	27.00	5.36	5.042	161.64	16.18	10.82
161.8	272	104.9	4.61	21.57	34.60	26.96	5.40	4.998	162.04	16.18	10.78
161.9	278	104.9	4.71	21.55	34.57	26.97	5.42	4.977	162.07	16.19	10.77
161.6	284	105.0	4.81	21.48	34.66	26.81	5.33	5.029	162.97	16.07	10.74
161.6	290	105.0	4.91	21.46	34.70	26.76	5.29	5.056	163.30	16.02	10.73
161.4	296	104.9	5.01	21.41	34.56	26.85	5.43	4.941	163.02	16.14	10.71
160.6	310	104.9	5.26	21.24	34.61	26.63	5.39	4.943	164.59	16.01	10.62
160.0	325	105.0	5.51	21.09	34.72	26.37	5.27	4.999	166.27	15.82	10.55
159.4	340	105.0	5.76	20.94	34.71	26.22	5.29	4.961	167.44	15.75	10.47
158.9	355	105.0	6.01	20.81	34.65	26.15	5.34	4.898	168.22	15.74	10.40
157.7	369	105.2	6.26	20.57	34.85	25.72	5.15	4.997	171.11	15.43	10.29
156.8	384	105.2	6.51	20.37	34.93	25.43	5.06	5.023	173.21	15.25	10.18
155.6	399	105.2	6.76	20.14	34.90	25.24	5.10	4.953	175.01	15.17	10.07
154.6	414	105.4	7.01	19.93	35.06	24.87	4.93	5.041	177.65	14.90	9.97
153.9	428	105.3	7.26	19.78	34.96	24.81	5.03	4.934	178.56	14.92	9.89
153.0	443	105.4	7.51	19.58	35.10	24.48	4.90	4.999	181.02	14.69	9.79
152.6	458	105.2	7.76	19.47	34.89	24.58	5.10	4.817	180.98	14.84	9.74
152.2	473	105.4	8.01	19.36	35.05	24.30	4.94	4.917	182.91	14.62	9.68
150.6	487	105.5	8.26	19.08	35.15	23.92	4.84	4.939	186.11	14.38	9.54
150.0	502	105.5	8.51	18.93	35.14	23.78	4.85	4.903	187.52	14.31	9.46
149.5	517	105.5	8.76	18.80	35.19	23.60	4.80	4.913	189.07	14.20	9.40
148.4	532	105.6	9.01	18.59	35.31	23.27	4.69	4.966	191.86	13.98	9.29
147.9	546	105.7	9.26	18.47	35.36	23.10	4.64	4.983	193.38	13.87	9.23
147.2	561	105.6	9.51	18.31	35.32	22.98	4.67	4.917	194.87	13.83	9.15
146.9	576	105.7	9.76	18.22	35.38	22.84	4.62	4.947	196.09	13.73	9.11
146.2	591	105.8	10.01	18.06	35.44	22.61	4.55	4.971	198.25	13.58	9.03
145.7	605	105.7	10.26	17.95	35.43	22.51	4.56	4.932	199.39	13.54	8.97
145.2	620	105.9	10.51	17.82	35.55	22.27	4.45	5.007	201.46	13.36	8.91
145.0	635	105.8	10.77	17.74	35.50	22.23	4.49	4.953	202.14	13.36	8.87
144.7	650	105.8	11.02	17.64	35.52	22.12	4.47	4.942	203.38	13.29	8.82
144.4	665	105.7	11.27	17.55	35.39	22.16	4.61	4.810	203.61	13.38	8.78
143.0	679	105.9	11.52	17.30	35.59	21.71	4.41	4.926	207.79	13.06	8.65
142.6	694	105.8	11.77	17.20	35.45	21.74	4.54	4.787	208.19	13.14	8.60
142.4	709	106.0	12.02	17.12	35.64	21.48	4.36	4.929	210.25	12.92	8.56
142.4	724	105.8	12.27	17.07	35.46	21.60	4.53	4.764	209.84	13.07	8.53
142.5	738	106.0	12.52	17.04	35.65	21.38	4.34	4.923	211.34	12.86	8.52
142.2	753	105.8	12.77	16.94	35.48	21.45	4.51	4.756	211.57	12.98	8.47
142.3	768	106.0	13.02	16.91	35.67	21.23	4.32	4.913	213.10	12.78	8.45
142.2	783	105.8	13.27	16.85	35.50	21.34	4.50	4.747	212.84	12.92	8.42
142.0	797	106.0	13.52	16.77	35.68	21.08	4.31	4.891	214.89	12.70	8.39
141.8	812	105.8	13.77	16.69	35.48	21.21	4.52	4.696	214.66	12.86	8.35
142.0	827	106.0	14.02	16.67	35.65	21.01	4.34	4.840	215.98	12.68	8.34
141.8	842	105.9	14.27	16.59	35.61	20.98	4.38	4.784	216.79	12.68	8.30
141.6	856	105.9	14.52	16.53	35.57	20.95	4.43	4.735	217.39	12.69	8.26
141.9	871	106.0	14.77	16.51	35.69	20.82	4.30	4.837	218.28	12.56	8.26
141.8	886	106.0	15.02	16.45	35.69	20.75	4.31	4.819	219.17	12.53	8.22
141.4	901	105.9	15.27	16.35	35.60	20.74	4.39	4.721	219.97	12.57	8.17
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16
141.6	914	106.1	15.50	16.33	35.83	20.49	4.17	4.918	221.65	12.33	8.16

Performed By: ALO   Input Validation: MAK   Reviewed By: ALO   Date Tested: 10/11/2019

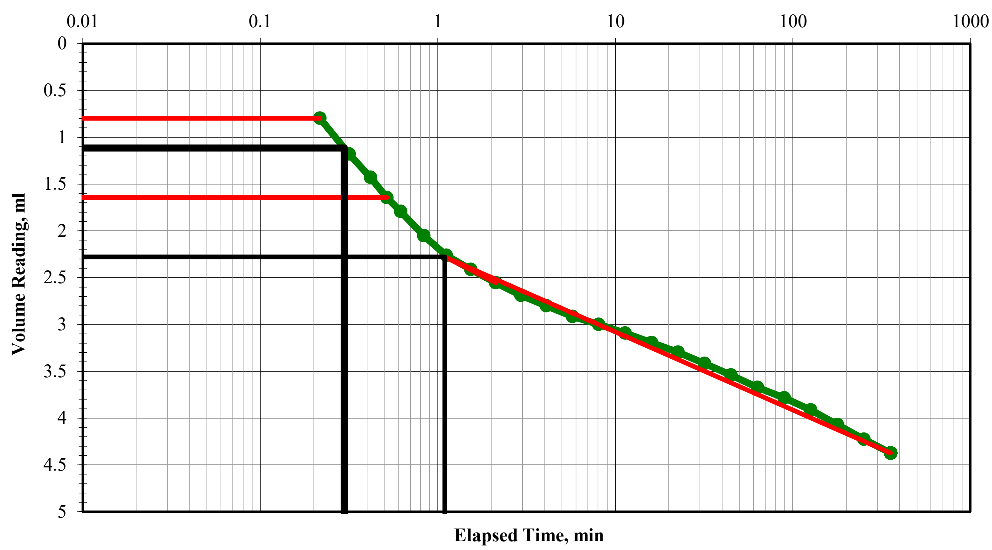
THREE DIMENSIONAL TRIAXIAL CONSOLIDATION TEST

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a	**Staged Consolidation**	
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'	Consolidation Plot Stress, psi	5.0
Project No.	42506 - Final Report	Sample	ST-2	**Final Test Pressures**	
		Lab Sample No	42506002	Cell Pressure, psi	100.3
USCS Description:	VERY DARK BROWN SILTY SAND			Back Pressure, psi	90.4
Test Conditions:	Undisturbed - Side And Double Drained			Effective Consol., psi	9.9
				Additional Consol. Volume, ml	0.0

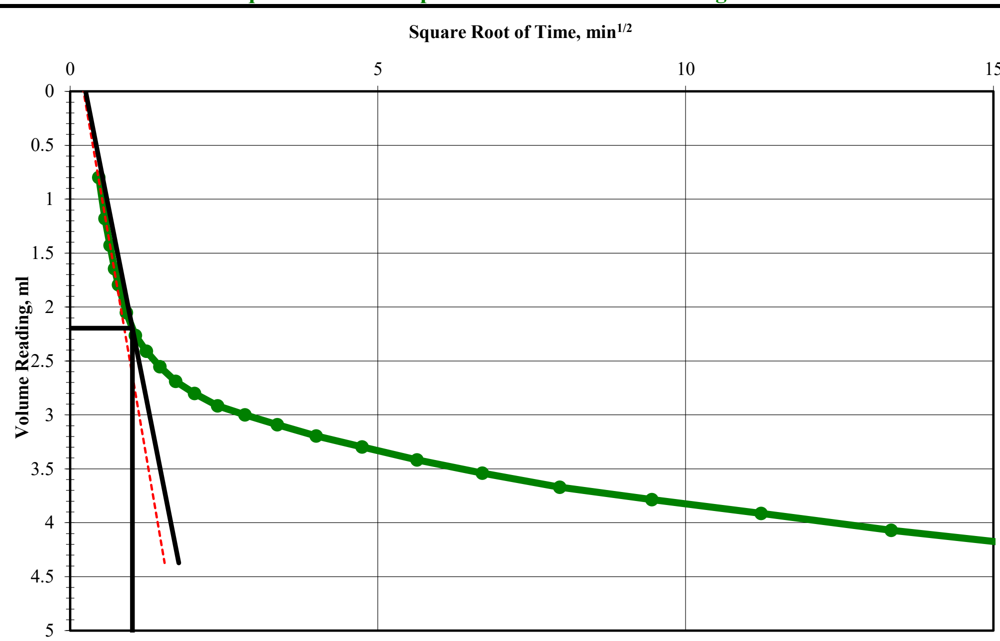
Consol. Start Date: 10/11/2019

Elapsed Time (min)	Sqrt Time ($min^{1/2}$)	Volume Reading ml
0	0	0.0
0.22	0.47	0.8
0.32	0.56	1.2
0.42	0.65	1.4
0.52	0.72	1.6
0.62	0.79	1.8
0.83	0.91	2.1
1.12	1.06	2.3
1.53	1.24	2.4
2.12	1.45	2.6
2.93	1.71	2.7
4.08	2.02	2.8
5.73	2.39	2.9
8.05	2.84	3.0
11.33	3.37	3.1
15.97	4.00	3.2
22.50	4.74	3.3
31.75	5.63	3.4
44.80	6.69	3.5
63.23	7.95	3.7
89.25	9.45	3.8
126.03	11.23	3.9
177.97	13.34	4.1
251.33	15.85	4.2
354.95	18.84	4.4

Log of Elapsed Time vs. Volume Reading



Square Root of Elapsed Time vs. Volume Reading



Sqrt. of Elapsed Time vs Volume		Log of Elapsed Time vs Volume		Consolidation Summary	
T0 = 0 min.	V0 = -0.7 ml.	T0 = 0 min.	V0 = 0.0 ml.	Initial Volume Reading, ml	0.0
T90 = 1.0 min	V90 = 2.2 ml.	T50 = 0.3 min.	V50 = 1.1 ml.	Final Volume Reading, ml	4.4
T100 = NA min	V100 = 2.5 ml.	T100 = 1.1 min.	V100 = 2.3 ml.	Total Volume Change, ml	4.4

Tested By: ALO Input Validation: MAK Reviewed By: ALO Date Tested: 10/11/2019

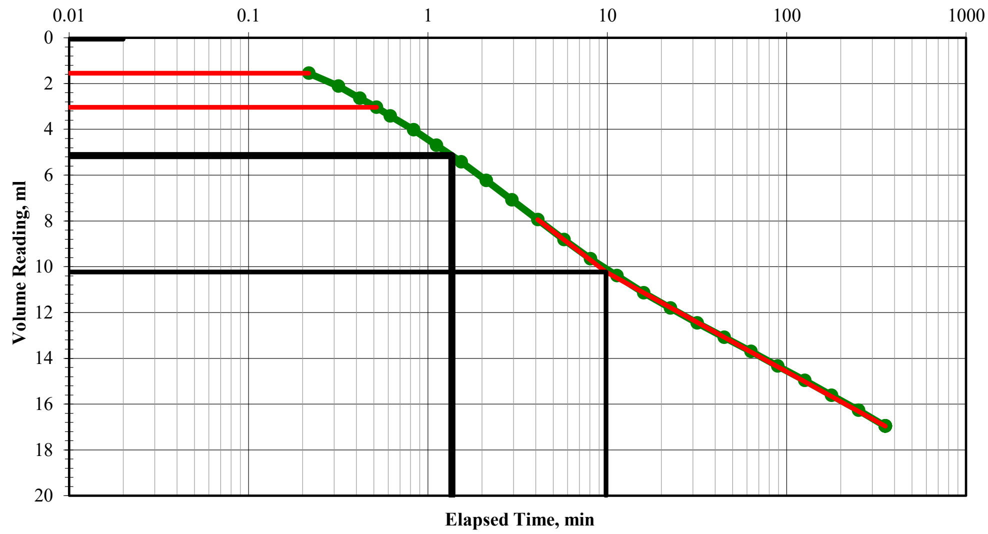
THREE DIMENSIONAL TRIAXIAL CONSOLIDATION TEST

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a	**Staged Consolidation**	
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'	Consolidation Plot Stress, psi	15.0
Project No.	42506 - Final Report	Sample	ST-2	**Final Test Pressures**	
		Lab Sample Nc	42506002	Cell Pressure, psi	110.4
USCS Description:	VERY DARK BROWN SILTY SAND			Back Pressure, psi	90.3
Test Conditions:	Undisturbed - Side And Double Drained			Effective Consol., psi	20.1
				Additional Consol. Volume, ml	0.0

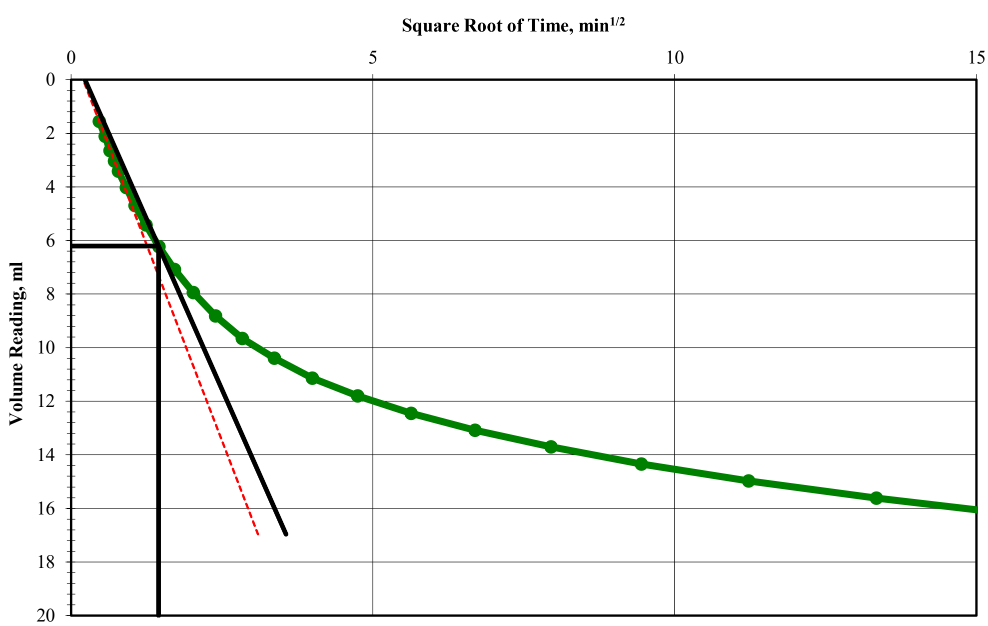
Consol. Start Date: 10/11/2019

Elapsed Time (min)	Sqrt Time ($min^{1/2}$)	Volume Reading ml
0	0	0.0
0.22	0.47	1.5
0.32	0.56	2.1
0.42	0.65	2.6
0.52	0.72	3.0
0.62	0.79	3.4
0.83	0.91	4.0
1.12	1.06	4.7
1.53	1.24	5.4
2.12	1.45	6.2
2.93	1.71	7.1
4.10	2.02	7.9
5.73	2.39	8.8
8.05	2.84	9.7
11.33	3.37	10.4
15.97	4.00	11.1
22.52	4.75	11.8
31.75	5.63	12.5
44.80	6.69	13.1
63.23	7.95	13.7
89.27	9.45	14.3
126.03	11.23	15.0
177.97	13.34	15.6
251.33	15.85	16.3
354.95	18.84	17.0

Log of Elapsed Time vs. Volume Reading



Square Root of Elapsed Time vs. Volume Reading



Sqrt. of Elapsed Time vs Volume		Log of Elapsed Time vs Volume		Consolidation Summary	
T0 = 0 min.	V0 = -1.2 ml.	T0 = 0 min.	V0 = 0.1 ml.	Initial Volume Reading, ml	0.0
T90 = 2.1 min	V90 = 6.2 ml.	T50 = 1.4 min.	V50 = 5.1 ml.	Final Volume Reading, ml	17.0
T100 = NA min	V100 = 7.0 ml.	T100 = 9.8 min.	V100 = 10.2 ml.	Total Volume Change, ml	17.0

Tested By: ALO | Input Validation: MAK | Reviewed By: ALO | Date Tested: 10/11/2019

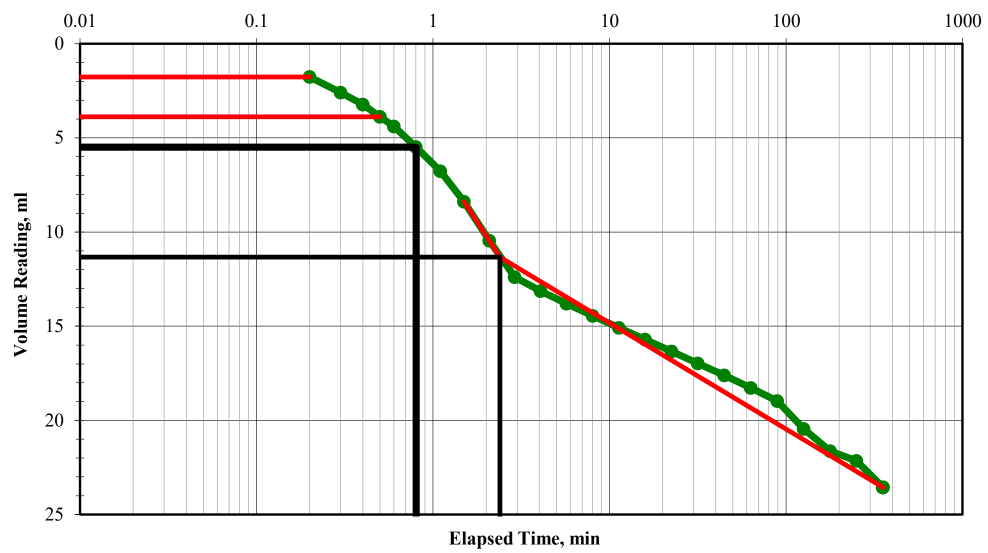
THREE DIMENSIONAL TRIAXIAL CONSOLIDATION TEST

Client	Civil & Environmental Consultants, Inc	Boring	B-31/31a	**Staged Consolidation**	
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'	Consolidation Plot Stress, psi	35.0
Project No.	42506 - Final Report	Sample	ST-2	**Final Test Pressures**	
		Lab Sample No	42506002	Cell Pressure, psi	110.3
USCS Description:	VERY DARK BROWN SILTY SAND			Back Pressure, psi	70.3
Test Conditions:	Undisturbed - Side And Double Drained			Effective Consol., psi	40.0
				Additional Consol. Volume, ml	0.0

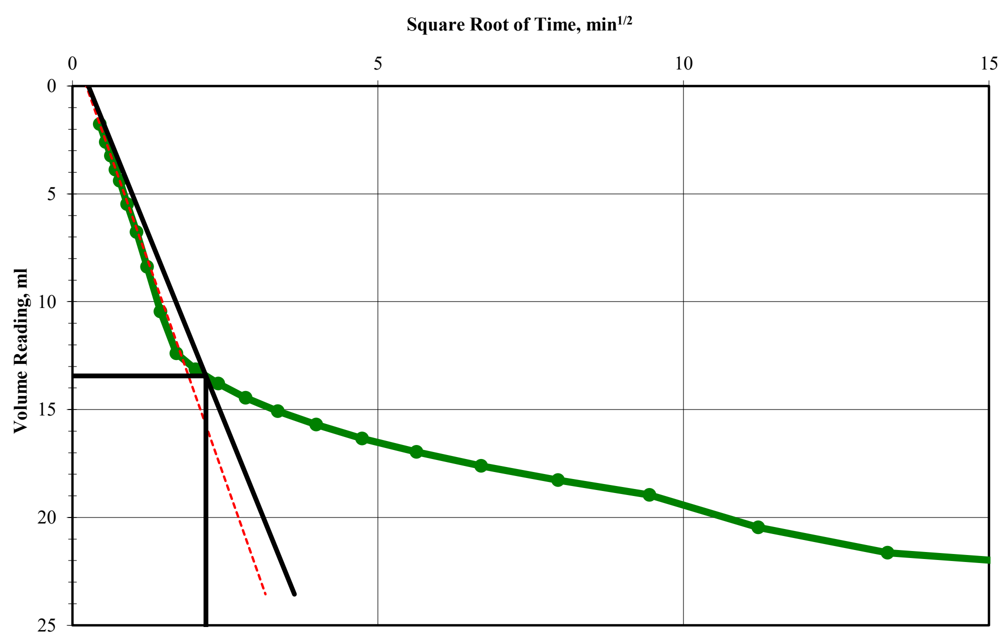
Consol. Start Date: 10/11/2019

Elapsed Time (min)	Sqrt Time ($min^{1/2}$)	Volume Reading ml
0	0	0.0
0.20	0.45	1.8
0.30	0.55	2.6
0.40	0.63	3.2
0.50	0.71	3.9
0.60	0.77	4.4
0.80	0.89	5.5
1.10	1.05	6.8
1.50	1.22	8.4
2.08	1.44	10.5
2.90	1.70	12.4
4.07	2.02	13.1
5.70	2.39	13.8
8.03	2.83	14.5
11.30	3.36	15.1
15.93	3.99	15.7
22.48	4.74	16.3
31.72	5.63	17.0
44.77	6.69	17.6
63.20	7.95	18.3
89.23	9.45	19.0
126.00	11.22	20.5
177.95	13.34	21.6
251.30	15.85	22.2
354.93	18.84	23.6

Log of Elapsed Time vs. Volume Reading



Square Root of Elapsed Time vs. Volume Reading



Sqrt. of Elapsed Time vs Volume		Log of Elapsed Time vs Volume		Consolidation Summary	
T0 = 0 min.	V0 = -1.8 ml.	T0 = 0 min.	V0 = -0.3 ml.	Initial Volume Reading, ml	0.0
T90 = 4.8 min	V90 = 13.4 ml.	T50 = 0.8 min.	V50 = 5.5 ml.	Final Volume Reading, ml	23.6
T100 = NA min	V100 = 15.1 ml.	T100 = 2.4 min.	V100 = 11.3 ml.	Total Volume Change, ml	23.6

Tested By: ALO Input Validation: MAK Reviewed By: ALO Date Tested: 10/11/2019

AFTER TEST PHOTOS

Client	Civil & Environmental Consultants, Inc.	Boring	B-31/31a
Client Project	174-960 Four Mile Run	Depth	8.0' - 10.0'
Project No.	42506 - Final Report	Sample	ST-2
		Lab No.	42506002
Visual Description	VERY DARK BROWN SILTY SAND		
Sample Condition	Undisturbed - Side And Double Drained		

TEST 1 **TEST 2** **TEST 3**

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-16a Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Civil & Environmental Consultants, Inc.	Boring	B-31
Client Project	174-960 Four Mile Run	Depth	15.0' - 17.0'
Project No.	42506	Sample	ST-3
Visual Description	BLACK SILTY SAND	Lab Sample No.	42506003
Sample Condition	Undisturbed		

SAMPLE CONDITIONS

Sample Status	Initial	Final
Tare Number	135	726
Wt. Tare & WS, gm	392.85	631.21
Wt. Tare & DS, gm	325.21	501.61
Wt. Tare, gm	146.88	189.05
Moisture Content, %	37.9%	41.5%
Wt. Tube & WS., gm	668.4	NA
Wt. Of Tube, gm	218.81	NA
Wt. Of WS., gm	449.6	461.1
Length 1, in	3.05	2.995
Length 2, in	3.056	2.932
Length 3, in	3.052	2.945
Top Diameter, in	2.846	2.768
Middle Diameter, in	2.844	2.728
Bottom Diameter, in	2.889	2.785
Average Length, **L**, cm	7.75	7.51
Average Area, **A**, cm^2	41.44	38.61
Sample Volume, cc	321.3	290.0
Unit Wet Wt., gm/cc	1.40	1.59
Unit Wet Wt., pcf	87.3	99.2
Unit Dry Wt., pcf	63.3	70.1
Unit Dry Wt., gm/cc	1.01	1.12
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	1.661	1.402
Porosity, n	0.624	0.584
Pore Volume, cc	200.57	169.29
Saturation, %	61.6%	

TEST CONSTANTS & EQUATIONS

Pipette Area, $\mathbf{a_p}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_p/(a_a+a_p)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1+ a_p/a_a$	1.0410
Sample Constant, **S** = L/A, cm^{-1}	0.195
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, **C** = M_1S/δ	4.67E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	1.8
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	4.6
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	2.91
Trial Constant, **T** = M_2 / z_1, cm	0.3571
Temperature Correction for 20°C, $\mathbf{R_t}$	0.971

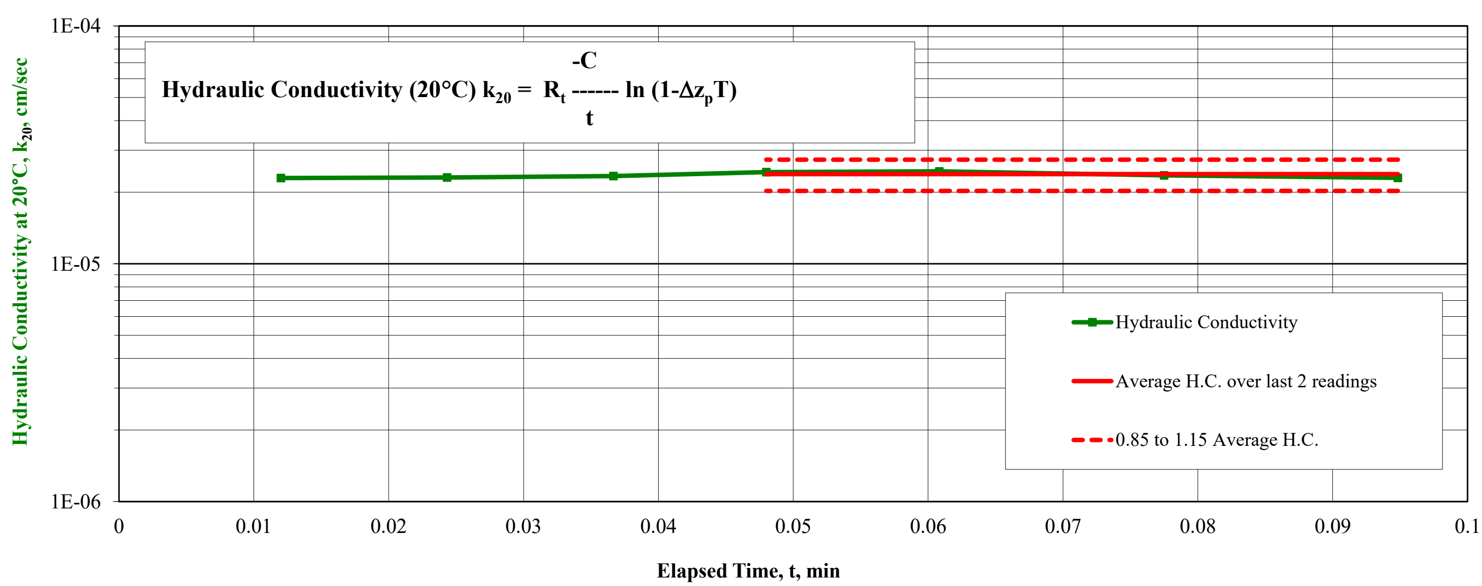
SAMPLE SUMMARY

Avg. Hydraulic Conductivity, k_{20}, cm/sec	**2.4E-05**
Initial Water Content, %	37.9%
Initial Dry Density, pcf	63.3
% Compaction	NA
Sample Status	Undisturbed
B Parameter	0.99
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	4.9
Average Test Temperature, °C	21.2

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p $R_{p0}-R_{pt}$	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} **Hydraulic Conductivity**
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	4.6	0	4.9	36.6	100.0%	5.26	4.74	NA
0.01	4.5	0.1	4.7	35.3	96.4%	5.25	4.75	2.29E-05
0.02	4.4	0.2	4.5	34.0	92.9%	5.24	4.76	2.30E-05
0.04	4.3	0.3	4.4	32.7	89.3%	5.23	4.77	2.34E-05
0.05	4.2	0.4	4.2	31.4	85.7%	5.22	4.78	2.43E-05
0.06	4.1	0.5	4.0	30.1	82.1%	5.21	4.79	2.45E-05
0.08	4	0.6	3.8	28.8	78.6%	5.20	4.80	2.36E-05
0.09	3.9	0.7	3.7	27.5	75.0%	5.20	4.80	2.30E-05

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Performed By: ALO	Input Validation: MAK	Reviewed By: ALO	Date Tested: 10/15/2019

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-16a Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Civil & Environmental Consultants, Inc.	Boring	B-30/B-30a
Client Project	174-960 Four Mile Run	Depth	6.0' - 8.0'
Project No.	42506	Sample	ST-1
Visual Description	VERY DARK GRAY GRAVELLY LEAN CLAY WITH SAND	Lab Sample No.	42506004
Sample Condition	Undisturbed		

SAMPLE CONDITIONS

Sample Status	Initial	Final
Tare Number	2071	735
Wt. Tare & WS, gm	305.46	809.27
Wt. Tare & DS, gm	272.8	694.83
Wt. Tare, gm	150.72	182.64
Moisture Content, %	26.8%	22.3%
Wt. Tube & WS., gm	854.3	NA
Wt. Of Tube, gm	220.24	NA
Wt. Of WS., gm	634.1	612.0
Length 1, in	3.047	3.036
Length 2, in	3.083	3.01
Length 3, in	3.042	3.032
Top Diameter, in	2.88	2.837
Middle Diameter, in	2.865	2.838
Bottom Diameter, in	2.866	2.833
Average Length, **L**, cm	7.77	7.69
Average Area, **A**, cm^2	41.75	40.75
Sample Volume, cc	324.2	313.2
Unit Wet Wt., gm/cc	1.96	1.95
Unit Wet Wt., pcf	122.1	121.9
Unit Dry Wt., pcf	96.3	99.7
Unit Dry Wt., gm/cc	1.54	1.60
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.750	0.691
Porosity, n	0.428	0.408
Pore Volume, cc	138.91	127.95
Saturation, %	96.3%	

TEST CONSTANTS & EQUATIONS

Pipette Area, $\mathbf{a_p}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_p/(a_a+a_p)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1+ a_p/a_a$	1.0410
Sample Constant, $\mathbf{S}$ = L/A, cm^{-1}	0.189
Specific Gravity, $\delta = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.53E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	1.8
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	7.2
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	5.62
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.1852
Temperature Correction for 20°C, $\mathbf{R_t}$	0.971

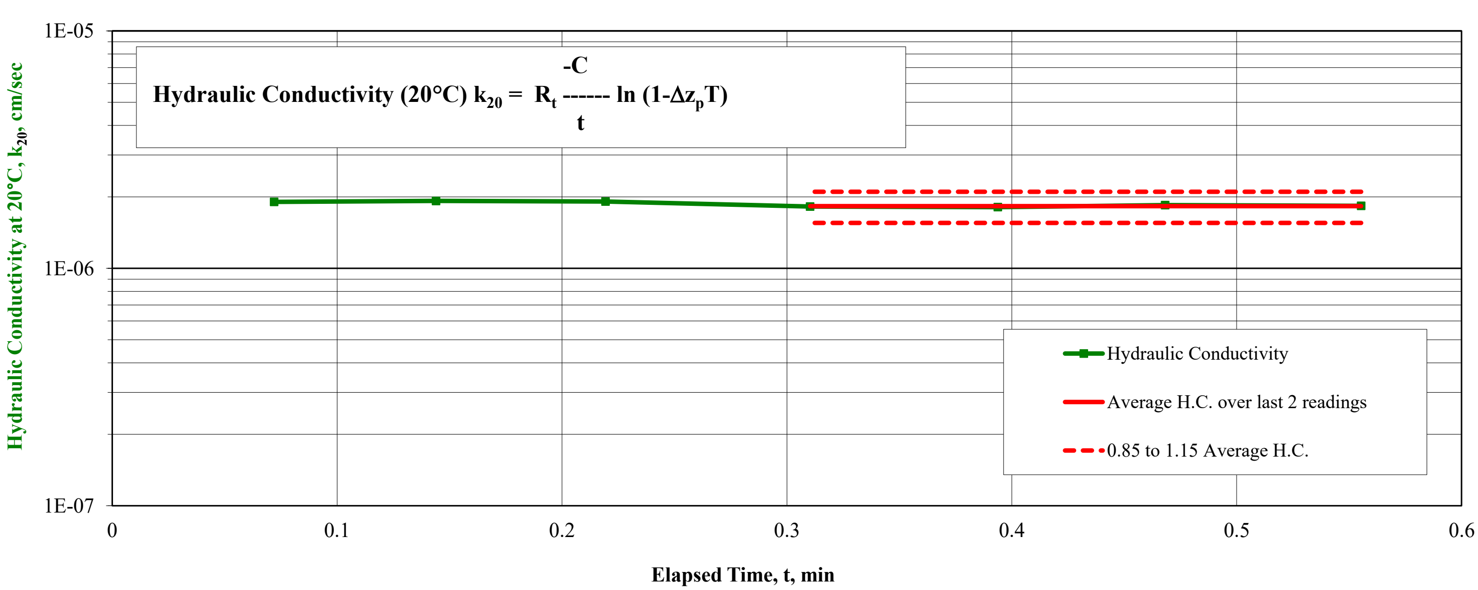
SAMPLE SUMMARY

Avg. Hydraulic Conductivity, k_{20}, cm/sec	**1.8E-06**
Initial Water Content, %	26.8%
Initial Dry Density, pcf	96.3
% Compaction	NA
Sample Status	Undisturbed
B Parameter	0.97
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	9.2
Average Test Temperature, °C	21.2

TEST DATA

t_i	R_{pt}	Δz_p	i	H_t	ΔH_t	σ'_{max}	σ'_{min}	k_{20}
Elapsed Time	Mercury Height	$R_{p0}-R_{pt}$	Gradient	Head	Percent of Initial Head from t=0	Effective Stress Max	Min	**Hydraulic Conductivity**
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	7.2	0	9.2	70.6	100.0%	5.50	4.50	NA
0.07	7.1	0.1	9.0	69.3	98.1%	5.49	4.51	1.90E-06
0.14	7	0.2	8.8	68.0	96.3%	5.48	4.52	1.92E-06
0.22	6.9	0.3	8.7	66.7	94.4%	5.47	4.53	1.91E-06
0.31	6.8	0.4	8.5	65.4	92.6%	5.47	4.53	1.82E-06
0.39	6.7	0.5	8.3	64.1	90.7%	5.46	4.54	1.81E-06
0.47	6.6	0.6	8.2	62.8	88.9%	5.45	4.55	1.85E-06
0.56	6.5	0.7	8.0	61.5	87.0%	5.44	4.56	1.83E-06

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Performed By: ALO | Input Validation: MAK | Reviewed By: ALO | Date Tested: 10/15/2019

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

APPENDIX E

SLOPE STABILITY ANALYSIS

PURPOSE

Based on the proposed modifications of the Panther Hollow Lake a permit application must be filed to the Pennslyvania Department of Environmental Proctection (PADEP). As part of the application and Pennsylvania Code Title 25, Chapter 105, Subchapter B, the design engineer (CEC) must include a dam stability report addressing the stability of the dam under the following conditions.

1. Normal pool with steady-state seepage conditions with a factor of safety (FS) of 1.5.
2. Maximum pool with steady-state seepage conditions with a FS of 1.4.
3. Sudden drawdown from normal pool conditions with a FS of 1.2.
4. Normal pool with steady-state seepage conditions under seismic forces produced by the maximum credible earthquake with a FS of 1.1.
5. Completion of construction with no pool with a FS of 1.3.

REFERENCES

1. EM 1110-2-1901, U.S. Army Corps of Engineers, "Seepage Analysis and Control For Dams", dated April 30, 1993.
2. TS 14R – Design and Use of Sheet Pile Walls in Stream Restoration and Stabilization Projects
3. "Principles of Geotechnical Engineering, 7$^{\text{th}}$ Edition", Braja M. Das
4. Table 1 from Naval Facilities Engineering Command (NAVFAC). Design Manual 7.2, "Foundations and Earth Structures", 1986
5. United States Geological Survey (USGS) Interactive Online Map, https://earthquake.usgs.gov/hazards/interactive/
6. The Pennsylvania Code Title 25 Environmental Protection, Chapter 105, Dam and Reservoirs

METHODOLOGY

Slope stability software Slide Version 8.0 (Slide) was used to estimate the steady-state seepage conditions through the dam at the normal and maximum pool elevations using the finite element model in Slide. This analysis assumed that the dam will have a constant normal pool at Elevation 806 (Scenarios 1, 3, and 4) or maximum pool at Elevation 813 (Scenario 2) based on the hydrologic & hydraulic (H&H) analysis of the proposed dam. Scenario 3 was modeled to have a sudden drawdown from normal pool elevation to no pool with no change in seepage.

The results of the seepage analysis were used to calculate the minimum FS for each of the five scenarios using Spencer's Method. A FS is commonly used to quantify the stability of a slope and is defined as the ration of the resisting forces to the driving forces. Slide uses 2D limit equilibrium methods to determine the seepage rate and minimum FS. An auto-refine non-circular search method with optimization was utilized to calculate all FS.

CROSS SECTION

External slope geometry used in the slope stability analysis was based on the coordinates depicted on Cross Section A-A in Appendix B of the Dam Stability Report. Subsurface geometry was based on the interpretation of the test borings/piezometer and field observations made by CEC. To evaluate the stability of the proposed dam, a critical cross section was analyzed considering proposed fill embankments and cut slopes.

MATERIAL PARAMETERS

Material parameters used in this analysis were based on the information obtained from the test borings, site specific laboratory testing, published typical values for similar soils, and our experience with similar materials. The following sections present the data obtained and assumptions made for determining the parameters for each material type in the analysis.

New Fill: The proposed grading to construct the modifications to the Panther Hollow Lake dam embankment requires fills up to approximately 4 feet in thickness. Structural cohesive fill will be placed to construct the core of the proposed Panther Hollow Lake dam embankment. The remaining fill placed at the site will consist of general fill. On-site excavated material will be used as general fill and structural cohesive fill, if possible. Other borrow sources may be required if the material excavated on site is not suitable. Due to the variability within the existing fill materials and the potential unknown source(s) of the materials that will be used to construct the proposed dam embankment, conservative strength parameters were used in this analysis to result in a minimum calculated FS of 1.5 for the normal pool steady seepage conditions scenario. These parameters result in shear strengths that are significantly lower than the anticipated shear strength of the material that will be used to construct the dam embankment based on the typical properties of compacted fill listed in Reference 4 and the compaction requirements for the new fill presented in the Dam Stability Report. The materials used to construct the dam embankment should meet or exceed the shear strength parameters presented in the following table or provide an equivalent shear strength, and they should be equal to or less than the permeability parameters presented in the following table.

Material Type	Unit Weight (pcf)	Angle of Friction (degrees)	Cohesion (psf)	Vertical Permeability (cm/sec)
Structural Cohesive Fill	125	27	0	1×10^{-6}
General Fill	125	27	0	1×10^{-4}

1. The horizontal permeability was assumed to be two times the vertical permeatility for conservatism.

Existing Fill: Laboratory testing was performed on select undisturbed samples from Test Boring B-30 and B-31 for in-situ shear strength and permeability parameters. In general, the existing fill materials at the site can be characterized as fine-grained (clays and silts with low to high plasticity) with varying amounts of sand and rock fragments. Based on the test boring logs, the existing fill material varies across the site and with depth. Generally, the existing fill is predominantly fine-grained and has an increase in coarse-grained material with depth. Zones of coarse-grained material were noted a varying depths in the test borings logs. A summary of the laboratory testing on the undisturbed samples from the existing fill are summarized in the following table.

Test Boring	Sample Depth (ft bgs)	USCS Group Symbol	In-situ Unit Weight (pcf)	Effective Stress		Total Stress		Permeability (cm/sec)
				Angle of Friction (degrees)	Cohesion (psf)	Angle of Friction (degrees)	Cohesion (psf)	
B-30	6 – 8	CL	122	--	--	--	--	1.8×10^{-6}
B-31	3 – 5	MH	97	34	144	13	691	--
B-31	8 – 10	SM	97	41	43	7	634	--
B-31	15 – 17	SM	87	--	--	--	--	2.4×10^{-5}
Average:			101					1.29×10^{-5}

After reviewing the results of the shear strength testing from Test Boring B-31 between 8 and 10 feet bgs, CEC concluded that the results were not representative of the in-situ material and were therefore omitted from this analysis. This was likely due to the high variability of the material within the Shelby tube. Additionally, based on the low N-Values observed within the existing fill, the results from Test Boring B-31 between 3 – 5 feet bgs were reduced by a FS of 1.5 for conservatism.

The minimum undrained strength used in the sudden drawdown and completion of construction scenarios was estimated using the following equation, which is representative of in-situ material with no overburden.

$$S_u = c + (\sigma'_v \times \tan\phi) = (691\text{psf} / 1.5) + [125\text{pcf} \times 0\text{ft} \times \tan(13^\circ)] = 461\text{psf}$$

Where: c = total stress cohesion from lab testing (with a FS = 1.5)
σ'_v = γ' x h = vertical effective stress at top of existing layer
γ' = effective unit weight of overburden
h = thickness of existing fill at downstream toe of overexcavation
ϕ = total stress angle of friction from laboratory testing

The change in undrained shear strength with depth (with a FS = 1.5) was determined using the following equation.

$\Delta S_u = \Delta\sigma'_v/\text{ft} \times d \times \tan\phi = [(101\ \text{pcf/ft} - 62.4\text{pcf/ft}) \times 1\text{ft} \times \tan(13^\circ)] / 1.5 = 6\ \text{psf/ft}$

Where: σ'_v/ft = change in vertical effective stress per foot
d = depth at which the undrained shear strength is calculated
ϕ = total stress angle of friction from laboratory testing

The following table summarizes the existing fill parameters used in this analysis.

Material Type	Unit Weight (pcf)	Effective Angle of Friction (degrees)	Effective Cohesion (psf)	Permeability (cm/sec)	Minimum Undrained Cohesion (psf)	Undrained Cohesion Increase With Depth (psf/ft)
Existing Fill1	101	23	96	1.29×10^{-5}	461	6

1. Strength values reduced by a FS of 1.5

<u>Decomposed Bedrock and Bedrock</u>: Where encountered in the test borings, the decomposed bedrock and bedrock consisted of claystone. Strength and permeability parameters for these materials were based on the Engineer's Logs, SPT values, the above listed references, and our past experience with these materials.

Material Type	Unit Weight (pcf)	Angle of Friction (degrees)	Cohesion (psf)	Permeability (cm/sec)
Decomposed Bedrock	135	26	300	1×10^{-8}
Bedrock	140	28	500	1×10^{-8}

SEISMIC

Shear wave accelerations due to an earthquake will produce a slope stability FS that is less than a corresponding slope stability FS governed by static conditions. The shear wave acceleration is modeled within the stability analysis by inputting a seismic coefficient that is some fraction of gravity (g). The peak acceleration for the site is estimated to be 0.0425 x g based Reference 5.

SEEPAGE

When analyzing the fill embankment at Cross Sections A-A a finite element model was developed to estimate the steady-state groundwater conditions. The horizontal permeability was assumed to be 2 times greater than the vertical permeability for the newly placed fill soils. These are conservative assumptions, which will increase the seepage through the embankment in the stability model and decrease the slope stability FS. This finite element groundwater model was evaluated to estimate the phreatic surface in steady-state conditions and then the minimum FS for slope stability was estimated using the steady-state phreatic surface.

Piezometer PZ-1 was previously installed along the Panther Hollow Lake embankment in June 2018. Groundwater data from July 2018 to September 2019 at PZ-1 was recorded using a data logger. Between those periods the maximum and minimum groundwater elevations ranged from approximately 806 to 801, averaging 803.

RESULTS AND CONCLUSIONS

The following table summarizes the results of the stability analysis for the five scenarios listed in the Pennslyvania Code.

Scenarios		Minimum Required FS	Minimum Calculated FS
1	Normal Pool - Steady State - Static	1.5	1.5
2	Max Pool - Steady State - Static	1.4	1.5
3	Normal Pool - Sudden Drawdown	1.2	1.5
4	Normal Pool - Steady State - Seismic	1.1	1.3
5	No Pool - Completion of Construction	1.3	1.5

Based on the FS presented in the summary table and the minimum target FS presented herin, all of the scenarios analyzed meet or exceed the minimum target FS per the Pennslyvania Code. CEC concludes that the proposed cut and fill slopes at the site should be stable if constructed in accordance with the recommendations presented in the Dam Stability Report.

ATTACHMENT A

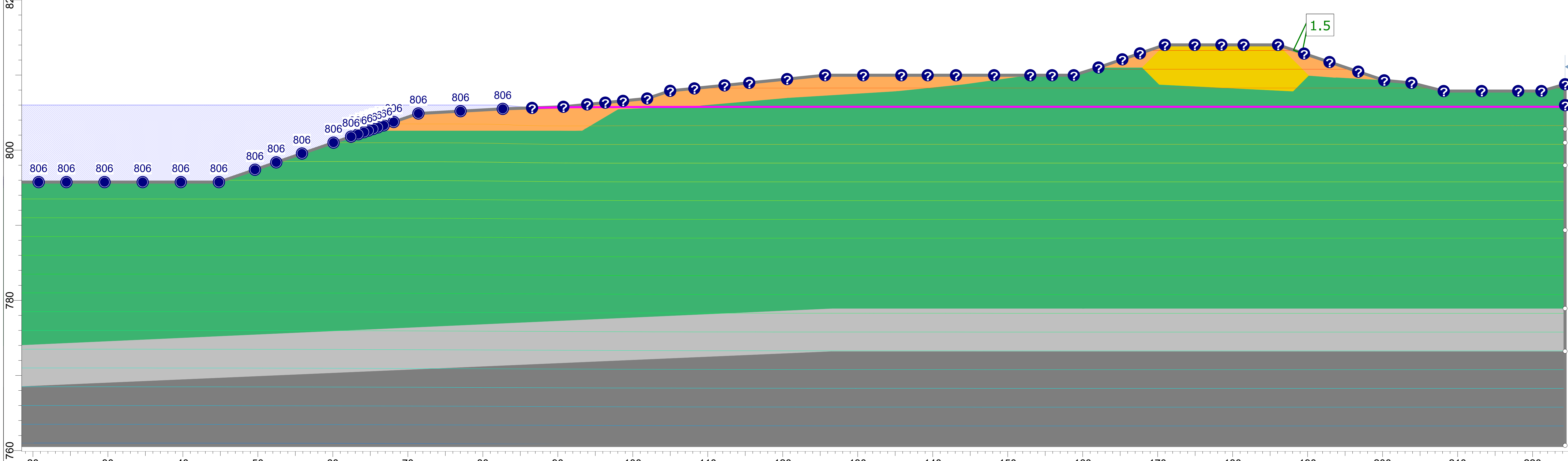
SLIDE OUTPUT

Panther Hollow Lake Slope Stability
Cross Section A - Normal Pool, Steady State Conditions

Material Name	Color	KS (ft/s)	K2/K1
Structural Cohesive Fill		3.28e-08	0.5
General Fill		3.28e-06	0.5
Existing Fill		4.23e-07	1
Decomposed Claystone		3.28e-10	1
Bedrock		3.28e-10	1

Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Structural Cohesive Fill		125	0	27
General Fill		125	0	27
Existing Fill		101	96	23
Decomposed Claystone		135	300	26
Bedrock		140	500	28

Pressure Head
[ft]
-7.5
-5.0
-2.5
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0
32.5
35.0
37.5
40.0
42.5
45.0
47.5
50.0



PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE REHABILITATION
CITY OF PITTSBURGH, ALLEGHENY COUNTY, PA

PROPOSED CONDITIONS CROSS SECTION A-A

DRAWN BY: JIO CHECKED BY: JMN | Scale: 1:153 | PREPARED BY: CIVIL & ENVIRONMENTAL CONSULTANTS, LLC

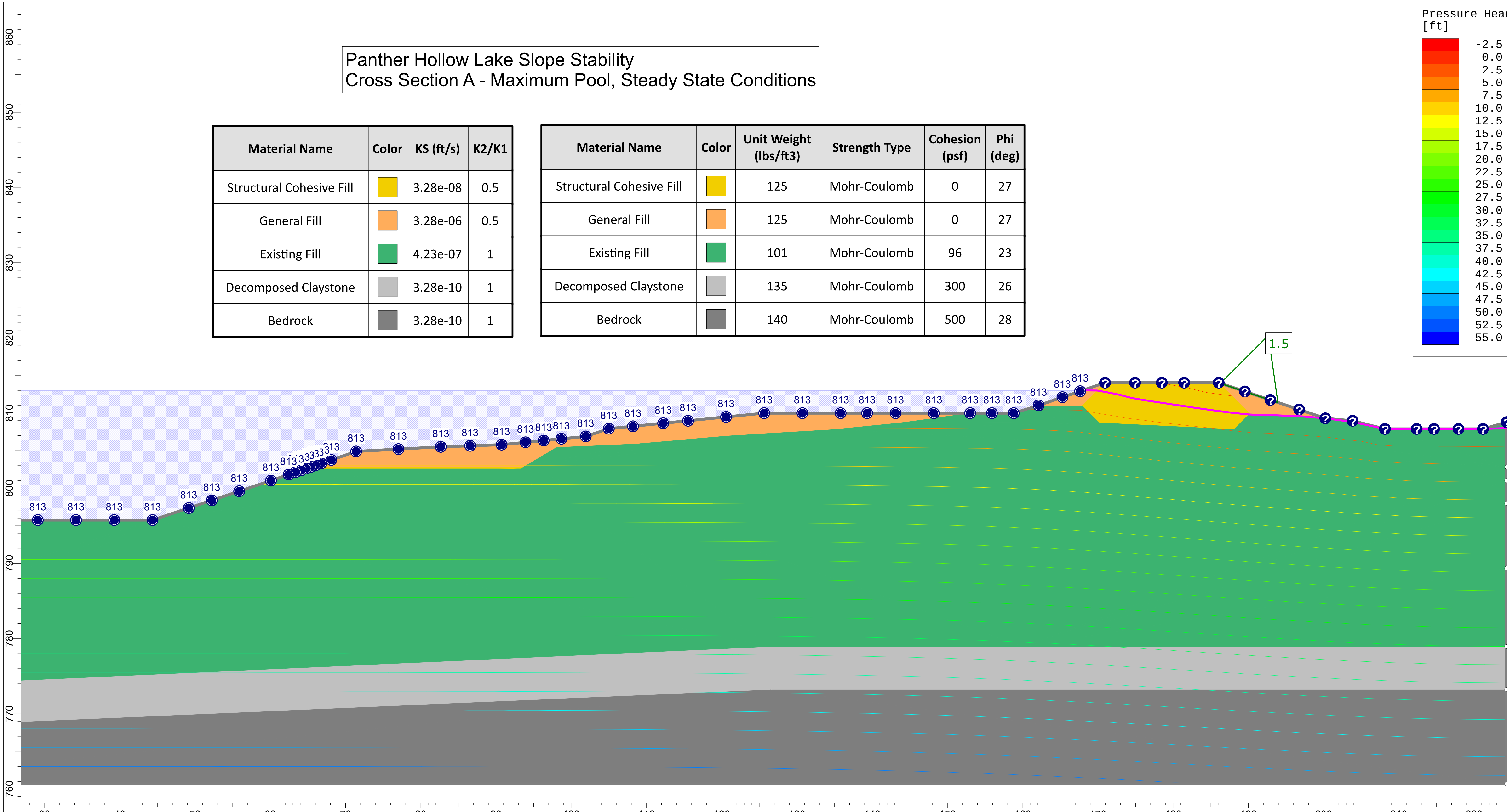
Date: 10/21/2019 | File Name: 174-960.001I-Cross Section A-Normal Pool.slmd

SLIDEINTERPRET 8.018

Panther Hollow Lake Slope Stability
Cross Section A - Maximum Pool, Steady State Conditions

Material Name	Color	KS (ft/s)	K2/K1
Structural Cohesive Fill		3.28e-08	0.5
General Fill		3.28e-06	0.5
Existing Fill		4.23e-07	1
Decomposed Claystone		3.28e-10	1
Bedrock		3.28e-10	1

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Structural Cohesive Fill		125	Mohr-Coulomb	0	27
General Fill		125	Mohr-Coulomb	0	27
Existing Fill		101	Mohr-Coulomb	96	23
Decomposed Claystone		135	Mohr-Coulomb	300	26
Bedrock		140	Mohr-Coulomb	500	28



PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE REHABILITATION
CITY OF PITTSBURGH, ALLEGHENY COUNTY, PA

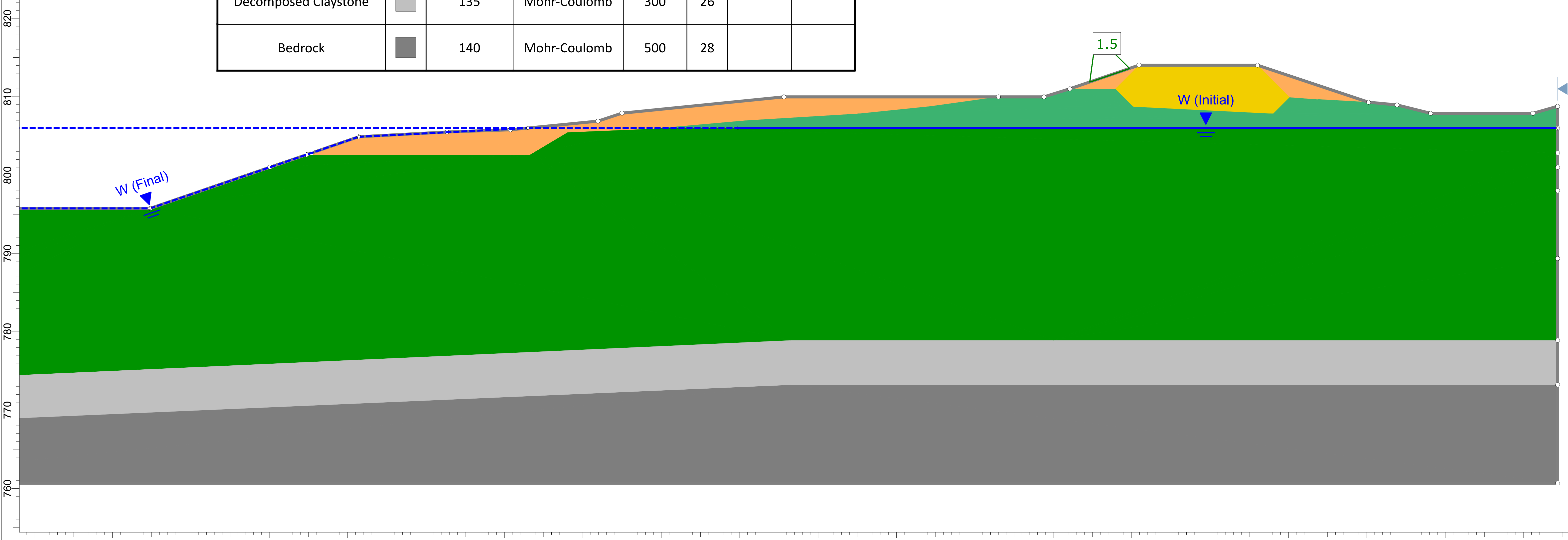
PROPOSED CONDITIONS CROSS SECTION A-A

DRAWN BY: JIO CHECKED BY: JMN	Scale: 1:147	PREPARED BY: CIVIL & ENVIRONMENTAL CONSULTANTS
Date: 10/21/2019		File Name: 174-960.001i-cross section a-max pool.slmd

SLIDEINTERPRET 8.018

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Cohesion Change (psf/ft)
Structural Cohesive Fill		125	Mohr-Coulomb	0	27		
General Fill		125	Mohr-Coulomb	0	27		
Existing Fill		101	Mohr-Coulomb	96	23		
Existing Fill - Undrained		101	Undrained	461		FDepth	6
Decomposed Claystone		135	Mohr-Coulomb	300	26		
Bedrock		140	Mohr-Coulomb	500	28		

Panther Hollow Lake Slope Stability
Cross Section A - Rapid Drawdown



PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE REHABILITATION
CITY OF PITTSBURGH, ALLEGHENY COUNTY, PA

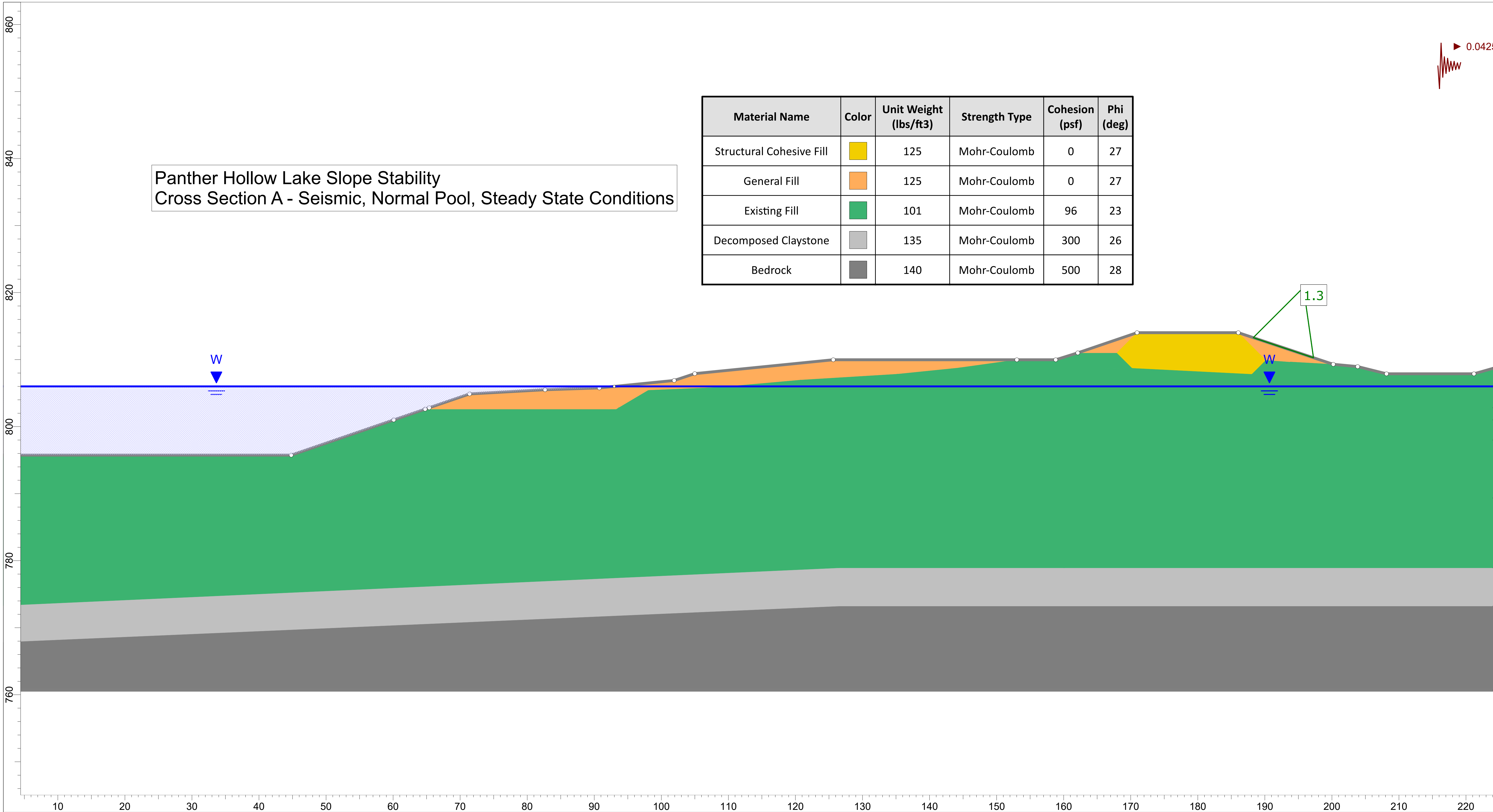
PROPOSED CONDITIONS CROSS SECTION A-A

DRAWN BY: JIO CHECKED BY: JMN	Scale: 1:147	PREPARED BY: CEC
Date: 10/21/2019		File Name: 174-960.001I-Cross Section A-RD, Seismic, EOC.slmd

SLIDEINTERPRET 8.018

Panther Hollow Lake Slope Stability
Cross Section A - Seismic, Normal Pool, Steady State Conditions

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Structural Cohesive Fill	Yellow	125	Mohr-Coulomb	0	27
General Fill	Orange	125	Mohr-Coulomb	0	27
Existing Fill	Green	101	Mohr-Coulomb	96	23
Decomposed Claystone	Light gray	135	Mohr-Coulomb	300	26
Bedrock	Dark gray	140	Mohr-Coulomb	500	28



PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE REHABILITATION
CITY OF PITTSBURGH, ALLEGHENY COUNTY, PA

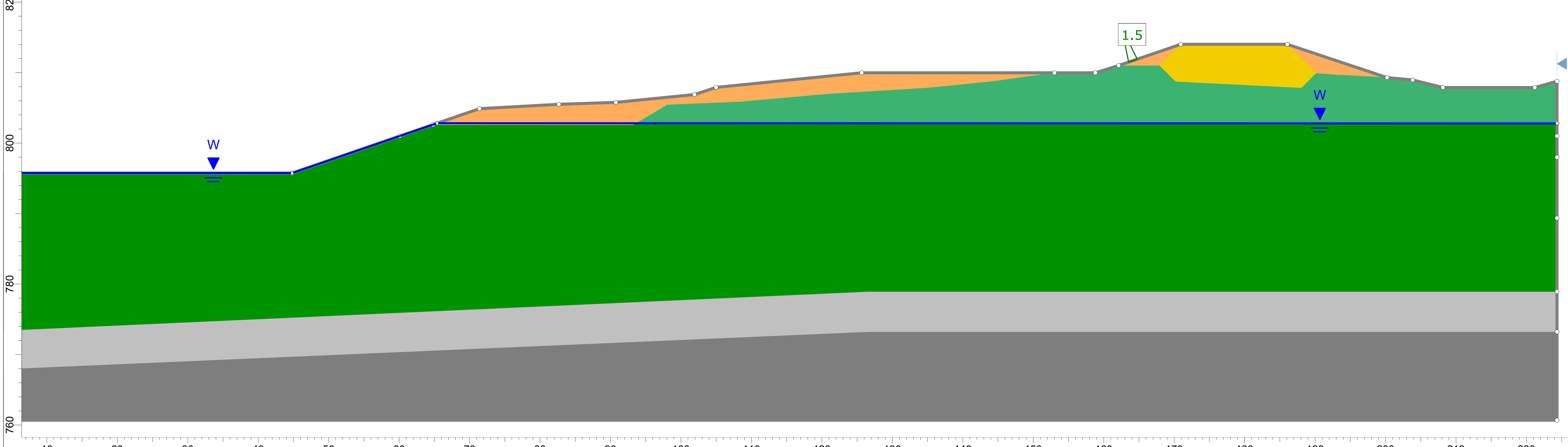
PROPOSED CONDITIONS CROSS SECTION A-A

DRAWN BY: JIO CHECKED BY: JMN	Scale: 1:163	PREPARED BY: CEC	
Date: 10/21/2019		File Name: 174-960.001I-Cross Section A-RD, Seismic, EOC.slmd	

SLIDEINTERPRET 8.018

Panther Hollow Lake Slope Stability
Cross Section A - End of Construction Conditions

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type	Cohesion Change (psf/ft)
Structural Cohesive Fill		125	Mohr-Coulomb	0	27		
General Fill		125	Mohr-Coulomb	0	27		
Existing Fill		101	Mohr-Coulomb	96	23		
Existing Fill - Undrained		101	Undrained	461		FDepth	6
Decomposed Claystone		135	Mohr-Coulomb	300	26		
Bedrock		140	Mohr-Coulomb	500	28		



PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE REHABILITATION
CITY OF PITTSBURGH, ALLEGHENY COUNTY, PA

PROPOSED CONDITIONS CROSS SECTION A-A

DRAWN BY: JIO CHECKED BY: JMN	Scale: 1:163	PREPARED BY: CEC
Date: 10/21/2019		File Name: 174-960.001I-Cross Section A-RD, Seismic, EOC.slmd

SLIDEINTERPRET 8.018

ATTACHMENT B

REFERENCES

Reference #1

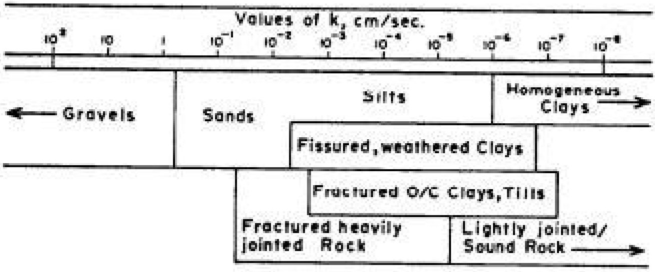


Figure 2-5. Approximate range in coefficient of permeability of soils and rocks (from Milligan[224])

ordinary gravel or soil and have tremendous influence on the watertightness of dam foundations and abutments as shown in figure 2-6 (Cedergren 1977). Figure 2-6a shows a soil profile surmised from several drill holes. The grain size analysis of soil samples taken at frequent intervals erroneously indicated that the deposit was composed of relatively uniform sandy gravels. Laboratory permeability tests on disturbed samples produced coefficients of permeability of about 1×10^{-6} cm/sec. Using this value of permeability, the probable seepage loss beneath the proposed dam was estimated to be 3 cu ft/day, which is an insignificant quantity. However, the design engineer had observed many openwork streaks in which the fines fraction of the material was almost completely absent along the banks of the river and noted that the ground-water table was level for several hundred feet away from the river and fluctuated rapidly with changes in river stage. Field pumping tests were conducted which indicated somewhat variable permeabilities but none approaching the magnitude of openwork gravels. Based upon the available data, the dam was designed with a cutoff trench to bedrock. During the excavation of the cutoff trench, streaks of openwork gravel were found throughout the foundation. A revised seepage computation based on a permeability of 30 cm/sec indicated that without the cutoff trench, the theoretical underseepage would be about 1,000,000 cu ft/day. If openwork gravel or other important discontinuities in earth dam foundations remain undetected, serious problems from excessive seepage and hydrostatic pressures will develop. This example illustrates the potential serious effects of deviations between the design assumptions and the as-built dam (Cedergren 1977). Also, thin continuous seams of cohesive soil can drastically alter the vertical flow through what would otherwise be a highly permeable site.

Technical Supplement 14R

Design and Use of Sheet Pile Walls in Stream Restoration and Stabilization Projects

Reference #2

drained (CD) or consolidated-undrained condition with pore pressure measurements (CU´) shear tests. The shear strength may also be estimated from *in situ* tests such as standard penetration tests or cone penetration tests. The drained shear strength applies to both short-term and long-term load conditions. Typical soil properties for coarse-grain materials are shown in table TS14R–1.

Fine-grain soils

Fine-grain soils such as clays and plastic silts are more complex. They have a low permeability, and shear strength of these materials varies with duration of load. They have the potential to develop excess pore pressure due to changes in loading. If a soil has low permeability and experiences a fast change in load, it will exhibit undrained shear strength parameters. If the load is maintained for a sufficient period of time, the soil will exhibit drained shear stress parameters. Analyses in fine-grain soils should consider both undrained and drained conditions, with the most critical condition governing the design.

For overconsolidated clay soils that contain fissures and slickensides, the design of a sheet pile wall should consider the fully softened shear strength. If the wall is being placed to stabilize a recent slide, the residual shear strength should be considered. Typical soil properties for fine-grain materials are shown in table TS14R–1. Tables TS14R–2 and TS14R–3 provide the description of coarse-grain soil density and fine-grain soil consistency. Figure TS14R–10 illustrates the empirical correlation between effective phi angle and PI (USACE 1994c) A more detailed treatment of soil properties is provided in NEH654 TS14A.

Table TS14R–1 Estimated soil properties

Soil type [1/]	Moist unit weight lb/ft^3	Sat. unit weight lb/ft^3	Undrained shear strength properties: Cohesion lb/ft^2	Undrained shear strength properties: Angle of internal friction ϕ	Drained shear strength properties: Cohesion lb/ft^2	Drained shear strength properties: Angle of internal friction ϕ	Angle of wall friction (steel pile) δ	Wall/soil adhesion [3/] lb/ft^2
Loose sand	95–125	120–130	0	28	0	28	$0.5 \times \phi$	0
Medium dense sand	110–130	125–135	0	32	0	32	$0.5 \times \phi$	0
Dense sand	110–140	130–140	0	38	0	38	$0.5 \times \phi$	0
Very soft clay	85–100	85–100	0–250	0	0	[2/]	$0.5 \times \phi$	0–250
Soft clay	100–120	100–120	250–500	0	0	[2/]	$0.5 \times \phi$	250–500
Medium clay	110–125	110–125	500–1,000	0	0	[2/]	$0.5 \times \phi$	500–750
Stiff clay	115–130	115–130	1,000–2,000	0	50–100	[2/]	$0.5 \times \phi$	750–950
Very stiff clay	120–140	120–140	2,000–4,000	0	100	[2/]	$0.5 \times \phi$	950
Hard clay	>130	>130	>4,000	0	100	[2/]	$0.5 \times \phi$	950

Compiled from USACE, EM 1110–2–2504, Design of Sheet Pile Walls; Pile Buck, Inc. Steel Sheet Piling Design Manual; and NAVFAC DM –7.2, Foundations and Earth Structures

1/ See tables TS14R–2 and TS14R–3 for qualitative descriptions of soil types.

2/ See figure TS14R–10 (USACE 1994c).

3/ Wall/soil adhesion is typically 0 for drained (long-term) conditions.

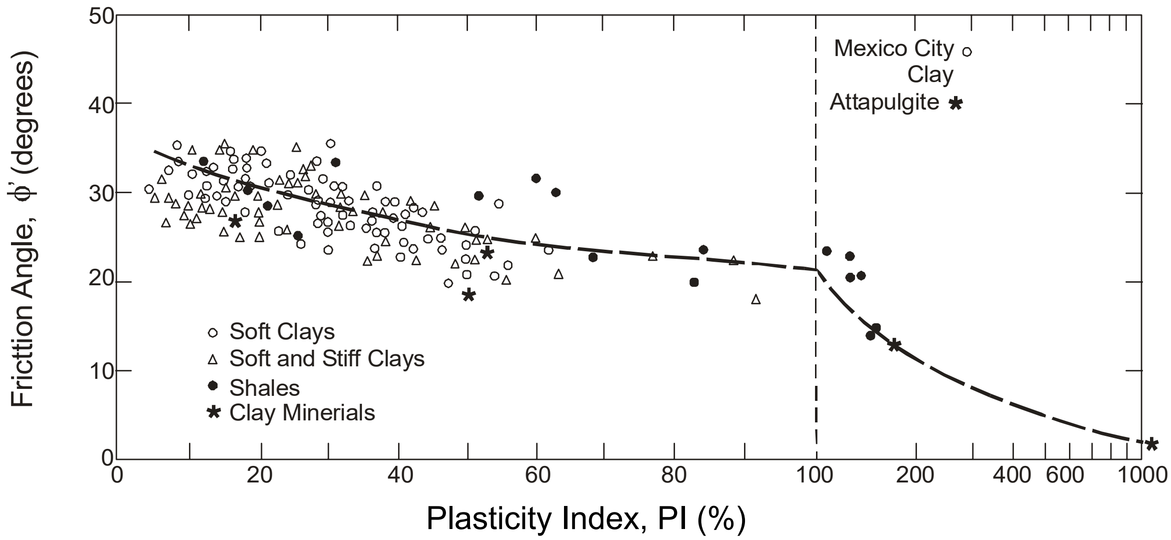


Figure 5-21. Relationships between ϕ and PI. (after Terzaghi, *et al.*, 1996).

5.5.6.3 Shear Strength of Cohesionless Soils

Because of their high permeability, pore water pressures do not build up significantly when cohesionless soils are subjected to shearing forces. The complication of total and effective stresses is therefore avoided and the phenomenon of apparent cohesion, or undrained shear strength does not occur. Consequently, the shear strength of cohesionless soils is defined exclusively in terms of frictional resistance between the grains, as measured by the angle of shearing resistance, ϕ. Typical values of ϕ for sands and gravels are given in Figure 5-22 as a function of dry unit weight and relative density. The material types indicated in the figure relate to the Unified Classification System (USCS).

Figure 5-22 requires determination of relative density. A reasonable estimate of relative density can be obtained from Figure 5-23. Figure 5-23 was originally developed based on data obtained using rope and cathead operated hammers. Thus, it is recommended that an energy corrected SPT N-value, i.e., N_{60}, be used as shown in Figure 5-23. However, note that Figure 5-23 is a function of both N-value and the vertical effective overburden pressure, p_o. Therefore, N_{60}-value should not be corrected for overburden pressure, i.e., C_N=1.0 (see Section 3.7.2) while using Figure 5-23.

FHWA NHI-06-088
Soils and Foundations - Volume 1, Page 56, December 2006

Reference #4

Reference #3

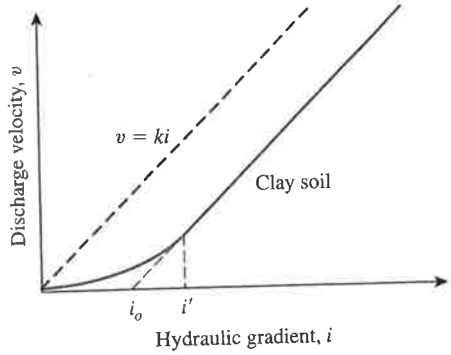


Figure 7.4
Variation of discharge velocity with hydraulic gradient in clay

natural clays. On the basis of his results, a hydraulic gradient i' (see Figure 7.4) appears to exist, at which

$$v = k(i - i_0) \qquad (\text{for } i \geq i') \tag{7.11}$$

and

$$v = ki^m \qquad (\text{for } i < i') \tag{7.12}$$

The preceding equation implies that for very low hydraulic gradients, the relationship between v and i is nonlinear. The value of m in Eq. (7.12) for four Swedish clays was about 1.5. However, several other studies refute the preceding findings. Mitchell (1976) discussed these studies in detail. Taking all points into consideration, he concluded that Darcy's law is valid.

7.3 Hydraulic Conductivity

Hydraulic conductivity is generally expressed in cm/sec or m/sec in SI units and in ft/min or ft/day in English units.

The hydraulic conductivity of soils depends on several factors: fluid viscosity, pore-size distribution, grain-size distribution, void ratio, roughness of mineral particles, and degree of soil saturation. In clayey soils, structure plays an important role in hydraulic conductivity. Other major factors that affect the permeability of clays are the ionic concentration and the thickness of layers of water held to the clay particles.

The value of hydraulic conductivity (k) varies widely for different soils. Some typical values for saturated soils are given in Table 7.1. The hydraulic conductivity of unsaturated soils is lower and increases rapidly with the degree of saturation.

Table 7.1 Typical Values of Hydraulic Conductivity of Saturated Soils

Soil type	k (cm/sec)	k (ft/min)
Clean gravel	100–1.0	200–2.0
Coarse sand	1.0–0.01	2.0–0.02
Fine sand	0.01–0.001	0.02–0.002
Silty clay	0.001–0.00001	0.002–0.00002
Clay	<0.000001	<0.000002

Reference #4

TABLE 1
Typical Properties of Compacted Soils

Group Symbol	Soil Type	Range of Maximum Dry Unit Weight, pcf	Range of Optimum Moisture, Percent	Typical Value of Compression: At 1.4 tsf (20 psi)	Typical Value of Compression: At 3.6 tsf (50 psi)	Typical Strength Characteristics: Cohesion (as compacted) psf	Typical Strength Characteristics: Cohesion (saturated) psf	Typical Strength Characteristics: ø (Effective Stress Envelope Degrees)	Typical Strength Characteristics: Tan ø	Typical Coefficient of Permeability ft./min.	Range of CBR Values	Range of Subgrade Modulus k lbs/cu in.
				Percent of Original Height								
GW	Well graded clean gravels, gravel-sand mixtures.	125 - 135	11 - 8	0.3	0.6	0	0	>38	>0.79	5×10^{-2}	40 - 80	300 - 500
GP	Poorly graded clean gravels, gravel-sand mix	115 - 125	14 - 11	0.4	0.9	0	0	>37	>0.74	10^{-1}	30 - 60	250 - 400
GM	Silty gravels, poorly graded gravel-sand-silt.	120 - 135	12 - 8	0.5	1.1	.....	.....	>34	>0.67	$>10^{-6}$	20 - 60	100 - 400
GC	Clayey gravels, poorly graded gravel-sand-clay.	115 - 130	14 - 9	0.7	1.6	.....	.....	>31	>0.60	$>10^{-7}$	20 - 40	100 - 300
SW	Well graded clean sands, gravelly sands.	110 - 130	16 - 9	0.6	1.2	0	0	38	0.79	$>10^{-3}$	20 - 40	200 - 300
SP	Poorly graded clean sands, sand-gravel mix.	100 - 120	21 - 12	0.8	1.4	0	0	37	0.74	$>10^{-3}$	10 - 40	200 - 300
SM	Silty sands, poorly graded sand-silt mix.	110 - 125	16 - 11	0.8	1.6	1050	420	34	0.67	$5 \times >10^{-5}$	10 - 40	100 - 300
SM-SC	Sand-silt clay mix with slightly plastic fines.	110 - 130	15 - 11	0.8	1.4	1050	300	33	0.66	$2 \times >10^{-6}$	5 - 30	100 - 300
SC	Clayey sands, poorly graded sand-clay-mix.	105 - 125	19 - 11	1.1	2.2	1550	230	31	0.60	$5 \times >10^{-7}$	5 - 20	100 - 300
ML	Inorganic silts and clayey silts.	95 - 120	24 - 12	0.9	1.7	1400	190	32	0.62	$>10^{-5}$	15 or less	100 - 200
ML-CL	Mixture of inorganic silt and clay.	100 - 120	22 - 12	1.0	2.2	1350	460	32	0.62	$5 \times >10^{-7}$	.....	
CL	Inorganic clays of low to medium plasticity.	95 - 120	24 - 12	1.3	2.5	1800	270	28	0.54	$>10^{-7}$	15 or less	50 - 200
OL	Organic silts and silt-clays, low plasticity.	80 - 100	33 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	50 - 100
MH	Inorganic clayey silts, elastic silts.	70 - 95	40 - 24	2.0	3.8	1500	420	25	0.47	$5 \times >10^{-7}$	10 or less	50 - 100
CH	Inorganic clays of high plasticity	75 - 105	36 - 19	2.6	3.9	2150	230	19	0.35	$>10^{-7}$	15 or less	50 - 150
OH	Organic clays and silty clays	65 - 100	45 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	25 - 100

Notes:

1. All properties are for condition of "Standard Proctor" maximum density, except values of k and CBR which are for "modified Proctor" maximum density.
2. Typical strength characteristics are for effective strength envelopes and are obtained from USBR data.
3. Compression values are for vertical loading with complete lateral confinement.
4. (>) indicates that typical property is greater than the value shown.
(..) indicates insufficient data available for an estimate.

Reference #5

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Conterminous U.S. 2014 (v4.0.x)

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

40.437

Time Horizon

Return period in years

2475

Longitude

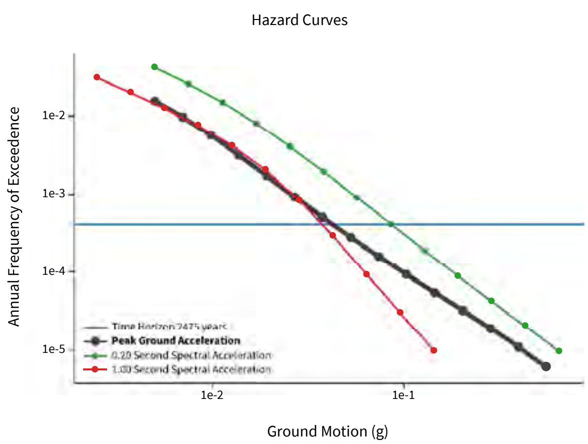
Decimal degrees, negative values for western long…

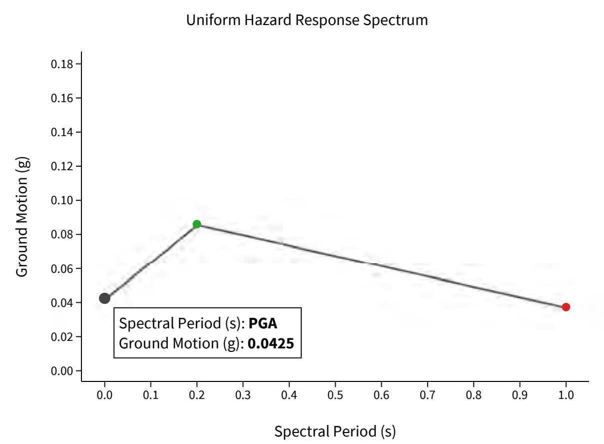
-79.949

Site Class

760 m/s (B/C boundary)

Hazard Curve





[View Raw Data](#)

Reference #6

§ 105.97. Stability of structures.

(a) Dams must be structurally sound and be constructed of sound and durable materials. The structure must be stable during and at the completion of construction.

(b) As part of the permit application for the construction or modification of a dam, the design engineer shall submit to the Department, under professional seal and certification, a report entitled ''Dam Stability Report'' which clearly demonstrates to the Department that the requirements of subsection (a) have been satisfied. At a minimum, this report must address the following considerations:

(1) The physical properties of the materials available for construction.

(2) A stability analysis based on the properties of the structure's materials and on the seismic forces and seepage conditions affecting the structure.

(3) The methods of construction.

(4) The conditions of operation of the dam and reservoir.

(c) Earthfill dams must be demonstrated to be stable for the following conditions:

(1) Normal pool with steady-state seepage conditions with a factor of safety of 1.5.

(2) Maximum pool with steady-state seepage conditions with a factor of safety of 1.4.

(3) Sudden drawdown from normal pool conditions with a factor of safety of 1.2.

(4) Normal pool with steady-state seepage conditions under seismic forces produced by the maximum credible earthquake with a factor of safety of 1.1.

(5) Completion of construction with no pool with a factor of safety of 1.3.

(d) Gravity dams must be demonstrated to be stable for the following conditions:

(1) Normal pool with appropriate uplift pressures, ice loads and silt loads with a factor of safety of 2.0.

(2) Maximum pool with appropriate uplift pressures and silt loads with a factor of safety of 1.7.

(3) Normal pool with appropriate uplift pressures and silt loads under seismic forces produced by the maximum credible earthquake with a factor of safety of 1.3.

(e) For gravity dams, the overturning stability is acceptable when the resultant of all forces acting on the dam is located as follows:

(1) Within the middle third of the structure for normal pool conditions.

(2) Within the middle half of the structure for maximum pool conditions.

(3) Within the structure for earthquake conditions.

(f) For gravity dams, the foundation bearing pressures must be less than or equal to the allowable for no pool, normal pool and maximum pool conditions and less than 133% of the allowable for earthquake conditions.

(g) The factors of safety for earthfill dams or gravity dams must be the higher of:

(1) The factors of safety in subsections (c) and (d).

(2) The factors of safety in the most recent Engineering Manuals developed by the United States Army Corps of Engineers relating to stability of dam structures.

(h) The Department may, in its discretion, consider a revised factor of safety for a class of dams or reservoirs when it can be demonstrated that the factor of safety provides for the integrity of the dams or reservoirs and adequately protects life and property.

Authority

The provisions of this § 105.97 under section 5 of the Dam Safety and Encroachments Act (32 P. S. § 693.5).

Source

The provisions of this § 105.97 adopted September 26, 1980, effective September 27, 1980, 10 Pa.B. 3843; amended January 7, 2011, effective January 8, 2011, 41 Pa.B. 219. Immediately preceding text appears at serial page (207722).

Cross References

This section cited in 25 Pa. Code § 105.81 (relating to permit applications for construction and modification of dams and reservoirs); and 25 Pa. Code § 105.89 (relating to Letters of Amendment and Letters of Authorization for modification of dams and reservoirs).

APPENDIX D

HYDRAULIC AND HYDROLOGIC TECHNICAL REPORT
(SECTION 6.7)

Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

HYDROLOGIC AND HYDRAULIC TECHNICAL REPORT FOR PANTHER HOLLOW LAKE

Prepared For:

The City of Pittsburgh, Department of Public Works
Parks Maintenance Division
and
Pittsburgh Water and Sewer Authority

Prepared By:

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

HYDROLOGIC AND HYDRAULIC TECHNICAL REPORT
The City of Pittsburgh, Department of Public Works and Pittsburgh Water and Sewer Authority
Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh, Pennsylvania

TABLE OF CONTENTS

Page

LIST OF APPENDICES

1.0 HYDROLOGIC AND HYDRAULIC ANALYSIS OF PROPOSED RESERVOIR

This Hydrologic and Hydraulic Report (H&H Report) has been prepared for the Pennsylvania Department of Environmental Protection, Division of Dam Safety (PADEP Dam Safety) to present the results of the hydrologic and hydraulic engineering analyses performed to produce dam breach inundation mapping for the proposed modification to the Panther Hollow Lake embankment and reservoir (Panther Hollow Lake). The modifications include raising the existing embankment from an elevation that varies from 808 to 810 feet to 814 feet to create additional stormwater storage, the installation of a principal spillway pipe and riser structure and the installation of an open channel emergency spillway over the raised embankment. This report also provides a summary of the hydrology, hydraulics, dam breach analysis and flood routing analysis using the existing dam geometry and the proposed dam geometry and the current statewide precipitation data. Based on classification guidelines found in PA Code, Title 25, Chapter 105, Subchapter B: Dams and Reservoirs, it is anticipated that this proposed reservoir will be classified as a Category C structure, with a height less than 40 feet and a volume less than 1000 acre-ft. During a meeting with PADEP Dam Safety on August 15, 2019, Panther Hollow lake was initially assigned a Class 1 Hazard Potential. In accordance with the PADEP Dam Safety guidance document entitled "Guidelines for Performing an Incremental Dam Breach Analysis and Downstream Inundation Study," the appropriate Spillway Design Flood (SDF) is routed through the dam and its reservoir without a dam breach and with a dam breach at the peak of the SDF runoff. Incrementally smaller storm events are modeled to determine the largest event that results in a one-foot impact at any damage center. This largest event will establish the Hazard Potential. The results of the analysis are discussed below.

1.1 PROJECT DESCRIPTION

Panther Hollow Lake, a man-made reservoir in Schenley Park, covers approximately 2.43 acres and was constructed between the years of 1907 and 1909. The lake was constructed from an already existing, but small body of water at the site. Two tributaries, Phipps Run and Panther Hollow Run, converge immediately upstream of the Lake, and provide the majority of the base and storm flow from the Oakland neighborhood of Pittsburgh near Carnegie Mellon University and from the Squirrel Hill neighborhood, near Bartlett Street, respectively. The Lake itself has a concrete step edge with pedestrian paths around the perimeter. This area of the park is highly utilized not only as a passage but also as social commons during both dry and wet weather. However, during large storm events, park amenities around the Lake become unusable due to flooding, mud and debris accumulation, and ice. Flow to the lake is controlled by means of a simple in-channel diversion structure, located at the confluence. During base flow and small storm conditions, flow from the tributaries is conveyed directly to the Lake through a small rectangular orifice (approx. 1'-9" wide x 12 to18" high) in a low concrete dam, approximately 2'-0" high. During larger storms, an 8'-0" bypass weir is engaged, which conveys larger flows to a concrete, trapezoidal bypass channel, having a bottom width of 3'-0" and a depth of approximately 3'-0". The channel effectively bypasses the Lake, and discharges into the combined sewer system by way of a large, grated ALCOSAN overflow structure, located in the northeast corner of the lake. This bypass channel also picks up several hillside seeps and stormwater discharges from the roadway above, and overland flow from the long, steep hillside immediately north of the Lake.

2.0 HYDROLOGY

The hydrologic modeling process selected by CEC utilizes the U. S. Army Corps of Engineers (USACE) Hydrologic Engineering Center's HEC-HMS software to perform the analyses.

HEC-HMS version 4.3 was used to simulate the precipitation-runoff process in a stepped drainage area system.

2.1 WATERSHED BOUNDARY

The watershed boundary for the proposed reservoir was broken into two subbasins; the area that drains to the reservoir from the east, and the reservoir itself. A watershed boundary was obtained using the USGS StreamStats application. The area of the reservoir was based on aerial drawings. See Appendix B-1 for the associated watershed map. Table 1 presents the drainage areas developed from a delineation utilizing the USGS StreamStats application.

Table 1 – Summary of Study Drainage Areas

Location	Drainage Area (square miles)
Drainage Area To Reservoir	0.61
Reservoir Area	0.0036

2.2 CURVE NUMBER

A weighted curve number (CN) was developed for the subbasin using land cover descriptions from the Natural Resource Conservation Service (NRCS) Technical Release 55 (TR-55) Table 2-2a. Hydrologic soil groups were determined from the NRCS Web Soil Survey (WSS) program. By reviewing aerial photography it was observed the subbasin is comprised of residential, commercial, and open areas, a composite CN of 84 (equivalent to Open Space, Fair condition, Type D soils) was used for the drainage area to the reservoir. A CN of 100 was used for the proposed reservoir area itself to simulate rainwater falling directly into the impoundment. See Appendix B-2 for the NRCS WSS Soil Map Results.

2.3 TIME OF CONCENTRATION

The time of concentration (T_c) for the hydrologic analysis was computed using the NRCS lag method calculation using HydroCAD. This method utilizes flow length, average watershed land slope, and maximum potential retention to account for the time it takes for storm water runoff to travel from the farthest point of the watershed to reach the reservoir. Flow length was determined using topographic data and aerial photographs. The average watershed land slope was determined using the USGS StreamStats application. For input into HEC-HMS, and in accordance with the NRCS National Engineering Handbook Chapter 15, Part 630.1502(a) (NEH), 2010, the T_c was then converted to a lag time (L). The following equations were used: 15-4b (for time of concentration), and equation 15-3 of the NEH (for the T_c and L computation).

(Time of Concentration, Equation 15-4b):

$$T_c = \frac{l^{0.8}\,(S+1)^{0.7}}{1{,}140Y^{0.5}}$$

T_c = time of concentration (hr)
l = flow length (ft.)
Y = average watershed land slope (%)
S = maximum potential retention (in), where:

$$S = \frac{1{,}000}{cn'} - 10$$

cn' = the retardance factor based on curve number

(Relation between Lag Time and Time of Concentration, Equation 15-3):

$$T_c = \frac{L}{0.6}$$

L = basin lag time (hours)
T_c = basin time of concentration (hours)

The time of concentration for the drainage area to the reservoir was found to be 51.6 minutes and the lag time was found to be 31.0 minutes. The lag time was input into HEC-HMS for the subbasin using the Soil Conservation Service (SCS) Unit Hydrograph transform method. See Appendix B-3 for the T_c inputs and calculation results.

2.4 PROBABLE MAXIMUM PRECIPITATION

In accordance with PA Code, Chapter 105, Subchapter B: Dams and Reservoirs, the minimum required design storm duration is 24 hours. Using NOAA's Hydrometeorological Report No. 51 (1978), the interpolation for the 10 square mile PMP map indicates a 24-hour PMP rainfall depth of 32.7 inches. As stated in Section 2.1, the total watershed for the proposed reservoir is 0.61 square miles. Since there are no PMP rainfall depth maps for watersheds less than 10 square miles to interpolate the proposed reservoir watershed area, the 10 square mile PMP map was used. See Appendix B-4 for PMP rainfall depth maps.

3.0 HEC-HMS MODELING: PROBABLE MAXIMUM FLOOD DETERMINATION

In accordance with the PADEP Dam Safety guidance document entitled "Guidelines for Performing an Incremental Dam Breach Analysis and Downstream Inundation Study," Depending upon the size classification of the dam per Section 105.91, the appropriate SDF is routed through the dam and its reservoir without a dam breach. It is also routed downstream through any potential damage centers. Similarly, the SDF is routed through the dam and its reservoir, but this time the dam is modeled to fail at the peak of the SDF runoff at the dam site. Downstream water levels are then compared to the computed water surface elevations of the no-dam-breach model.

If increases in water surface elevations are less than one foot for Step 1, a similar analysis should be performed for incrementally smaller events (various %s of the SDF) to determine the largest event that results in a one-foot impact at any damage center. This largest event will establish the Hazard Potential.

CEC performed HEC-HMS analysis for the 24-hour 0.5PMP and 24-hour PMP storm events to determine the PMF.

For the temporal distribution of the 24-hour 0.5PMP and 24-hour PMP analyses, the Dimensionless Design Storm Distribution and the Modified SCS Type II at 1.5 hour time step were utilized. For the precipitation input into HEC-HMS, 0.5 hour time step intervals were derived from the modified SCS Type II with 1.5 hour time step intervals per the Hydrometeorological Report No.51. These values were utilized for the analyses.

The results indicate that the proposed reservoir is able to pass 100 percent of the 24-hour PMP with a peak inflow of 3,763.10 cubic feet per second (cfs), peak outflow of 3,762.12 cfs, and a maximum water surface elevation of 816.05. The proposed reservoir can pass 100 percent of the 24-hour 0.5PMP storm with a peak inflow of 1,823.82 cfs, a peak outflow of 1,822.82 cfs, and a maximum water surface elevation of 815.17. The proposed dam embankment crest elevation is 814. See Appendix B-5 for the 0.5PMP and PMP HEC-HMS analysis results.

Table 2 presents a summary of results from the HEC-HMS analysis developed by CEC for the selected rainfall events.

Table 2 – Reservoir PMP Storm Summary

Rainfall	Total Rainfall (inches)	Peak Reservoir Inflow (cfs)	Peak Reservoir Outflow (cfs)	Max. WSEL
24-hour 0.5PMP	16.4	1823.82	1,822.28	815.17
24-hour PMP	32.7	3763.10	3,762.01	816.05

4.0 FREQUENCY EVENT MODELING

Additional flood routing was performed for the 100-Year 24-hour and 50-Year 24-hour frequency storm events. The NOAA Atlas 14 precipitation frequency chart was used to determine the 100-Year 24-hour rainfall depth of 4.93 inches and the 50-Year 24-hour rainfall depth of 4.41 inches. For the temporal distribution of the 100-Year and 50-Year storm events, the SCS Type II distribution was utilized. See Appendix B-6 for the NOAA chart of the 100-Year and 50-Year frequency storm rainfall data.

The results from the HEC-HMS analysis by CEC were reviewed and the results indicated that for the 100-Year storm event, the peak inflow is 787.41 cfs and the maximum water surface elevation in the proposed reservoir is 814.48. For the 50-Year storm event, the peak inflow is 672.41 cfs and the maximum water surface elevation is 814.31. See Appendix B-7 for the results of the HEC-HMS analysis for the 100-Year and 50-Year frequency events.

Table 3 presents a summary of results from the HEC-HMS analysis for the 100-Year and 50-Year storm events.

Table 3 –Frequency Storm Summary

Storm Event	Total Rainfall (inches)	Peak Reservoir Inflow (cfs)	Peak Reservoir Outflow (cfs)	Max. WSEL
50-Year	4.41	672.41	544.57	814.31
100-Year	4.93	787.41	699.70	814.48

5.0 DAM HYDRAULICS

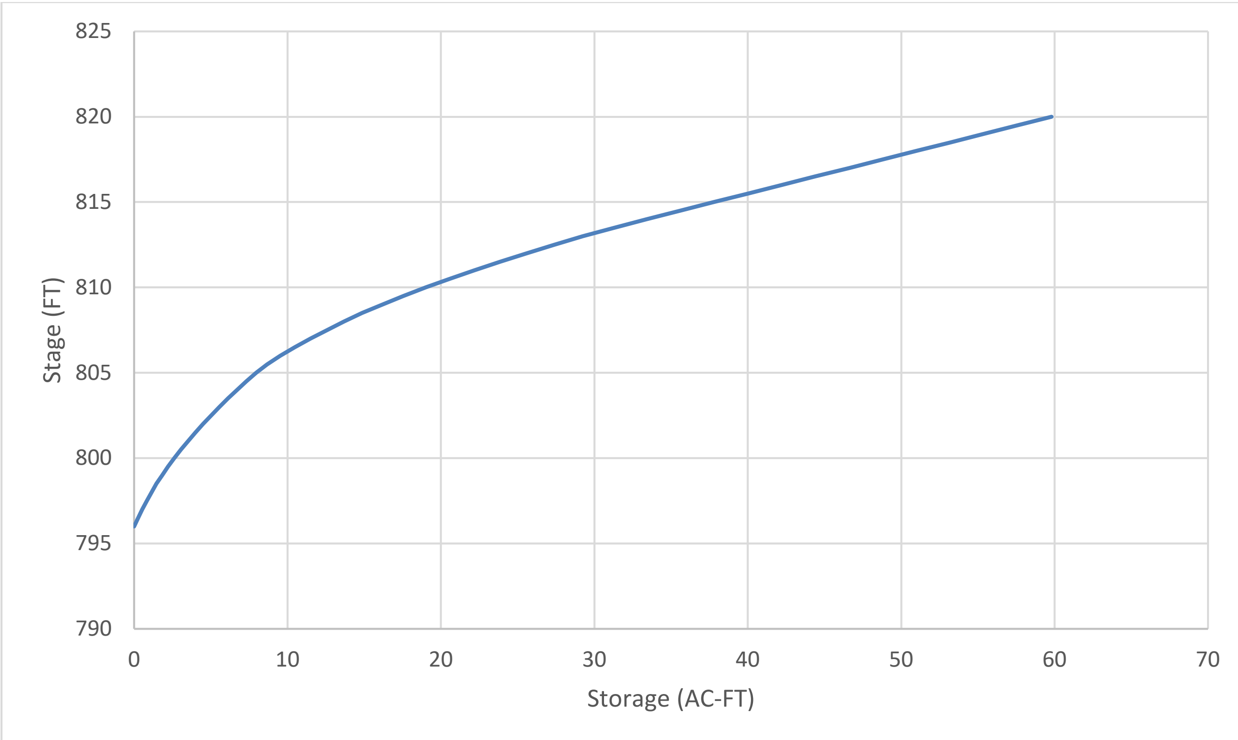
The hydraulic modeling process selected by CEC utilized the USACE HEC-HMS software to perform the reservoir routing and dam breach analyses. Spillway discharge rating curves were developed using the HydroCAD v10.0 software and these curves were imported into HEC-HMS and the remainder of the model was constructed in HEC-HMS. HEC-HMS is used to simulate the hydrologic inflow to the reservoir and the routing of the inflow through the proposed outlet spillway design.

5.1 STAGE-STORAGE RELATIONSHIP

Stage-storage curves depict the relationship between the water surface elevation (ft.) in a reservoir and the volume of water being stored. It is necessary to determine the stage-storage curves for the proposed reservoir to understand how the reservoir performs during flooding events to attenuate peak inflows; during both seasonally wet and dry conditions and to assess the reservoir yield.

CEC developed a stage-storage curve for the proposed reservoir. The stage-storage curve is presented in Figure 1. See Appendix B-8 for the proposed reservoir stage-storage table and Appendix B-9 for the proposed reservoir design plans.

Figure 1 – Reservoir Stage-Storage Curve



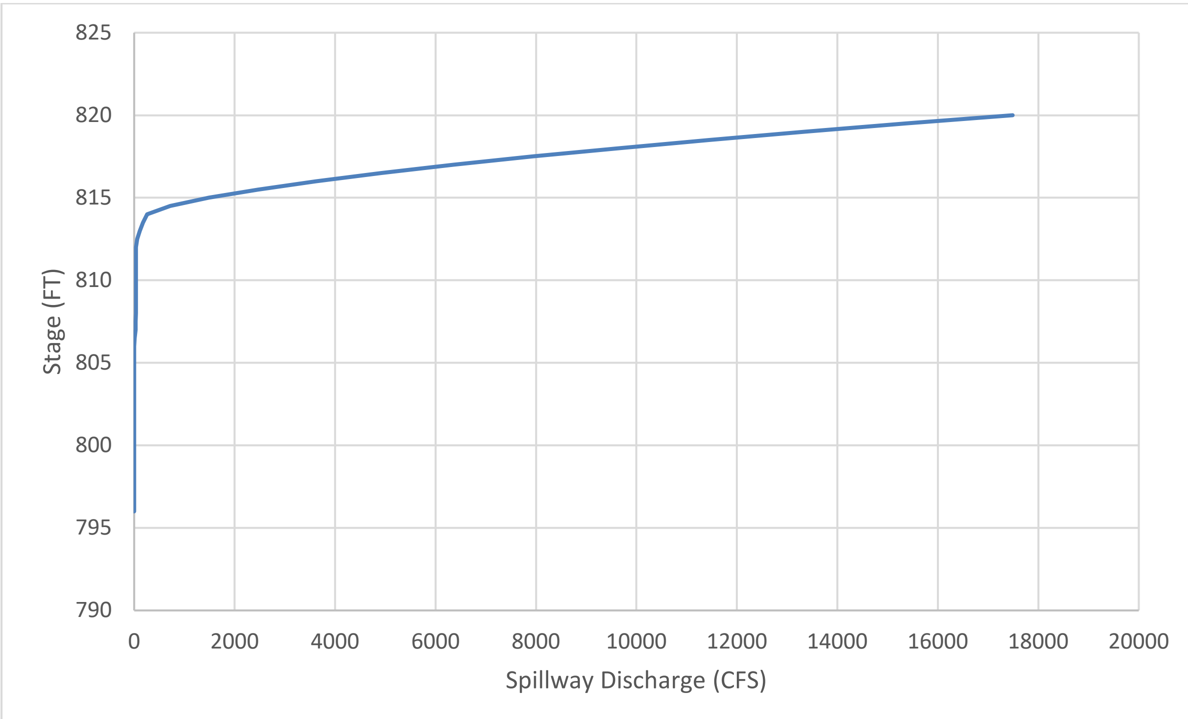
The proposed reservoir stage vs storage curve was used in the HEC-HMS model to accurately predict and design the response of the reservoir and spillway to the modeled flood events. The development of the HEC-HMS model is discussed in Section 3.0.

5.2 SPILLWAY RATING CURVE

For the proposed reservoir, the primary spillway is comprised of 36 inch riser structure operating at a rim elevation of 806.0. The riser drains into a 24 inch pipe inlet at an elevation of 800.0 that drains to an outlet at an elevation of 792.0 over a pipe length of 555 feet. Additionally, an emergency spillway is included to accommodate discharge at higher elevations. The emergency spillway selected comprised of a cross section extending north and south between Panther Hollow Lake and the adjacent rail line. The trapezoidal cross section has a weir length of 25 feet (ft) set to an elevation of 812.0, 6 ft above the maximum operating pool.

A spillway rating curve was developed for this structure and input into HEC-HMS. The spillway rating curve is presented below in Figure 2. See Appendix B-10 for the proposed spillway stage-discharge table.

Figure 2 – Spillway Stage-Discharge Curve



6.0 HYDRAULIC AND DAM BREACH ANALYSES

HEC-RAS was developed by the USACE and performs two-dimensional unsteady, subcritical and supercritical flow modeling for various open channel systems on digital terrain surfaces for determination of flood inundation depths and limits. The hydraulic and dam breach analyses began using "dam break" analysis tool in HEC-HMS to model the dam breach location in each of the hydrologic scenarios. Four dam failure hydrographs were calculated using the scenario-specific pool elevations. The hydrographs were then routed with the two-dimensional (2D) HEC-RAS functions onto the 2D terrain mesh to determine inundation depths and limits.

6.1 UNSTEADY FLOW

Unsteady flow modeling in HEC-RAS was completed using the 2D full momentum based equations which utilizes St. Venant Equations of Conservation of Mass and Momentum. Full momentum modeling is an appropriate choice for this type of extended period simulation as it accounts for time and attenuation of the flood and breach waves which rise and fall rapidly. The full momentum equations account for dramatic changes in flow velocity.

6.2 DAM FAILURE ANALYSES

Dam breach modeling was completed with input parameters in accordance with the Federal Guidelines for Inundations Mapping of Flood Risks Associated with Dam Incidents and Failures (FEMA P-946, July 2013). A piping failure breach was analyzed for the 24-hour PMP, 24-hour 0.5PMP, 100-Year 24-hour, 50-Year 24-hour and Sunny Day conditions scenarios. Breaches were simulated utilizing the level-pool breach routing method in the HEC-HMS Dambreak program. The parameters and resulting breach hydrographs are detailed in the following sections.

6.2.1 Breach Drawdown Analysis

A Drawdown Analysis was performed to determine whether the dam breach modeling for the proposed reservoir should be simulated using the level pool routing or the dynamic routing method. The level pool routing simulation requires modeling a reservoir with a storage area and the dynamic routing for modeling a reservoir requires cross sections. The design criteria for the breach drawdown analysis include geometric functions of the dam and reservoir such as the height, length, breach development time and breach width. If the Drawdown Number (Dn) is determined to be >0.41, level pool routing is recommended. If the Dn is <0.24, dynamic routing is recommended. The drawdown analysis calculations performed generated a Dn for the proposed reservoir of 0.89, therefore, level-pool routing was chosen for use. See Appendix B-11 for the detailed Drawdown Analysis.

6.2.2 Computation Intervals

Numerically stable models for simulations were obtained using a computation interval of 3 seconds. The detailed output interval for tabulated hydrographs was set at 1 minutes. The total computation was set to 24 hours to ensure that the maximum inundation limits were reached in each scenario and the floodwaters were receding before the end of computations.

6.2.3 Dam Failure Analyses

The proposed reservoir was analyzed with one dam breach simulation location in each of the four hydrologic models. The dam breach was located along the southwestern corner of Panther Hollow Lake. See Inundation Maps in Appendix B-12 for the breach location. The parameters and resulting breach hydrographs are detailed in the following sections.

6.2.4 Breach Parameters

Geometric and temporal parameters were used to define the breaches at the proposed reservoir. The parameters include:

- Breach Width (BR);
- Breach side slopes (Z); and,
- Full breach formation time, or time-to-failure (TFH).

The breach parameters were estimated using the breach parameters identified within FEMA P-946 and as recommended by the PADEP Dam Safety guidance document entitled “Guidelines for Performing an Incremental Dam Breach Analysis and Downstream Inundation Study,”. The PADEP guidance includes a range of parameters for breach situations. For an earth-fill dam, the average breach width (BR) ranges from one-half the height of the dam to 3 times the height of the dam. The breach side slopes (Z) for earthen dams range from 0.25H:1V to 1H:1V (horizontal to vertical). The time-to-failure (TFH) ranges from 6 minutes to 4 hours.

The bottom elevation of the breach analysis was set to the toe of the proposed dam. The bottom elevations at the breach was 802, based on proposed dam grading.

6.2.4.1 Average Breach Width

Based on the suggested breach parameters within the PADEP guidance and a dam height of 12 feet (dam crest of 814 and toe of 802) for the breach location, the breach width (BR) should range from 6 to 36 feet wide for the southwest breach. For the purpose of this study a BR of 36 feet for the breach simulations was selected, approximately 3 times the dam height in that location.

6.2.4.2 Breach Side Slopes

Based on the suggested breach parameters within the PADEP guidance, the breach side slopes (Z) for earthen dams range from 0.25H:1V to 1H:1V. A maximum value of 1H:1V was selected for the breach side slopes (Z) for the proposed reservoir.

6.2.4.3 Full Breach Formation Time

The PADEP guidance suggests a full breach formation time (TFH), or time-to-failure, ranging from 6 minutes to 1 hour. Accordingly, this study selected a median TFH value of 30 minutes for use in analyzing the worst-case dam breach failure scenario for this proposed reservoir.

6.3 DAM BREACH RESULTS

The breach parameters selected for the southwest breach location analysis is a BR of 36 feet, breach side slopes of 1H:1V, and a TFH of 0.5 hours. Calibration of the start time of the breach was performed in order to calculate the most conservative result with the maximum peak discharge.

A summary of the results for the selected breach parameters are listed in Table 4 below. Dam breach hydrographs for each scenario can be found in Appendix B-12.

Table 4 – Summary of Breach Results

Scenario	Southwest 24-HR PMF	Southwest 100YR, 24-HR	Southwest Sunny Day
Breach Trigger		WSEL	WSEL
	816.05	814.3	12:00
Pool Elevation at Breach, Initial (ft)	816.05	814.3	806
Time Breach Occurs	12:02	12:22	12:00
Breach Type	Piping Failure	Piping Failure	Piping Failure
Piping Failure Breach Initial Elevation (ft)	802	802	802
Storage Volume at Breach (ac-ft)	43.29	35.72	9.52

6.3.1 Check of Dam Breach Results

An additional method was used to calculate values for the dam failure peak discharge for comparison against the results calculated in HEC-HMS. The Froehlich equation for dam break peak discharge utilizes the volume and height of water at the time of the breach. The equation is shown below, where V_w is equal to the volume of water (ac-ft.) and H_w is the height of the water above the breach invert elevation (ft.):

$$Q_p = 40.1 \times V_w^{0.295} \times H_w^{1.24}$$

Table 5 – Check of Breach Results Comparison

Scenario	WSEL (ft.)	Peak Discharge, Modeled (cfs)	Peak Discharge, Froehlich (cfs)
PMP	816.05	4,576	3,228
100YR	814.3	2,403	2,587
Sunny Day	806	243	435

*Max WSEL from PMF Determination Calculations (Sect 3.0)

The results for the PMP breach analysis calculated by the Froehlich method, although lower than the modeled values, are within a reasonable range of estimates determined by dam breach calculations per FEMA P-946 guidelines modeled in HEC-HMS.

6.3.2 Sensitivity Analysis

A sensitivity analysis was conducted to evaluate the effects of changes to the breach failure type and full breach formation time to the peak discharge from the dam breach. The breach side slopes and breach width were held at a constant value in order to independently evaluate the effects of the breach failure type and breach formation time on the peak discharges. Table 6 below summarizes the results of the minimum and maximum parameters discussed in Section 7.2.4.

Table 6 – Breach Location Sensitivity Analysis Results

Breach Parameter	Selected	Breach Failure Type Sensitivity		Time to Failure Sensitivity (Piping Failure Breach)	
		Overtopping	Piping	Minimum	Maximum
BR (ft.)	36	36	36	36	36
Z (H:V)	1:1	1:1	1:1	1:1	1:1
TFH (hrs.)	0.5	0.5	0.5	4.0	0.1
Breach Scenario	**Discharge at Dam (cfs)**	**Discharge at Dam (cfs)**	**Discharge at Dam (cfs)**	**Discharge at Dam (cfs)**	**Discharge at Dam (cfs)**
24-HR PMP	4,576	4,257	4,576	3,764	5,924
100YR, 24-HR	2,403	1,762	2,403	771	4,293
Sunny Day	243	271	243	122	476

7.0 2D MODELING OF FLOOD INUNDATION IMPACTS

7.1 2D HEC-RAS GEOMETRY

A LiDAR Digital Surface Model was the basis of the terrain model of the entire study area. The proposed reservoir grading was added to the LiDAR surface to create a composite proposed conditions surface. HEC-GeoRAS, a software tool developed by the USACE, was then used to create a 2D surface mesh from the composite surface data. This 2D surface mesh was then imported into the HEC-RAS geometry file as the basis for flood inundation analyses. Mesh grid sizes of, 20 feet, and 30 feet were tested in order to compare results of the inundated area. A mesh size of 20 feet was chosen as the final 2D geometry for reporting purposes.

A default Manning's 'n' value of 0.06 was used for the 2D surface mesh.

7.2 STUDY AREA CROSSINGS

The 2D HEC-RAS geometry includes two 36 inch which transition to three 36 inch culverts as shown on the inundation mapping.

7.3 2D BOUNDARY CONDITIONS AND MINIMUM FLOWS

The downstream boundary conditions for the Monongahela River was set to the stage hydrograph method in routing simulations. A constant stage elevation of 722.0 was used, based on observed conditions at the time of the field survey and aerial imagery.

The upstream boundary condition used for the modeling of the breach scenarios was direct hydrograph input from the HEC-HMS dam break routing. No base flows or minimum flows were needed for the 2D hydraulic model.

7.4 2D COMPUTATIONAL INTERVAL

Computation intervals for the 2D analyses were set to 3 seconds in order to generate numerically stable models. The detailed output interval for tabulated hydrographs was set at 1 minute. The total computation was set to 24 hours to ensure that the dam breach hydrograph was routed completely through the downstream limit of the analysis.

8.0 FLOOD HAZARD SUMMARY

This study predicts dam breach flooding and potential impacts to the roads and culverts in the study area. Flood inundation limits from the proposed reservoir breach analyses can be found on the Flood Inundation Maps in Appendix B-13.

9.0 CONCLUSIONS

The proposed reservoir, as presented in this analysis, is able to pass the PMF flood. This will be accomplished by a combination of storage and spillway discharge.

10.0 LIMITATIONS AND EXPECTATIONS

The findings and opinions presented are relative to the dates of CEC's site survey and the referenced hydrologic and hydraulic data sets and should not be relied on to represent conditions at substantially later dates. The opinions included herein are based on information obtained during the study of CEC's experience. If additional information becomes available that might impact CEC's conclusions, CEC requests the opportunity to review the information, reassess the potential concerns, and modify CEC's opinions, if warranted. If our services included a review or use of documents or data sources prepared by others, CEC has no responsibility for accuracy of information contained therein.

CEC has relied on the accuracy of models and calculations enclosed by the regulatory authorities. Their analyses are in general accordance with industry standards. CEC makes no warrants or representations as to the accuracy or quality of these methods.

11.0 REFERENCES

- National Oceanic and Atmospheric Administration (NOAA). "Hydrometeorological Report No. 51: Probable Maximum Precipitation Estimates, United States East of 105th Meridian." June 1978.
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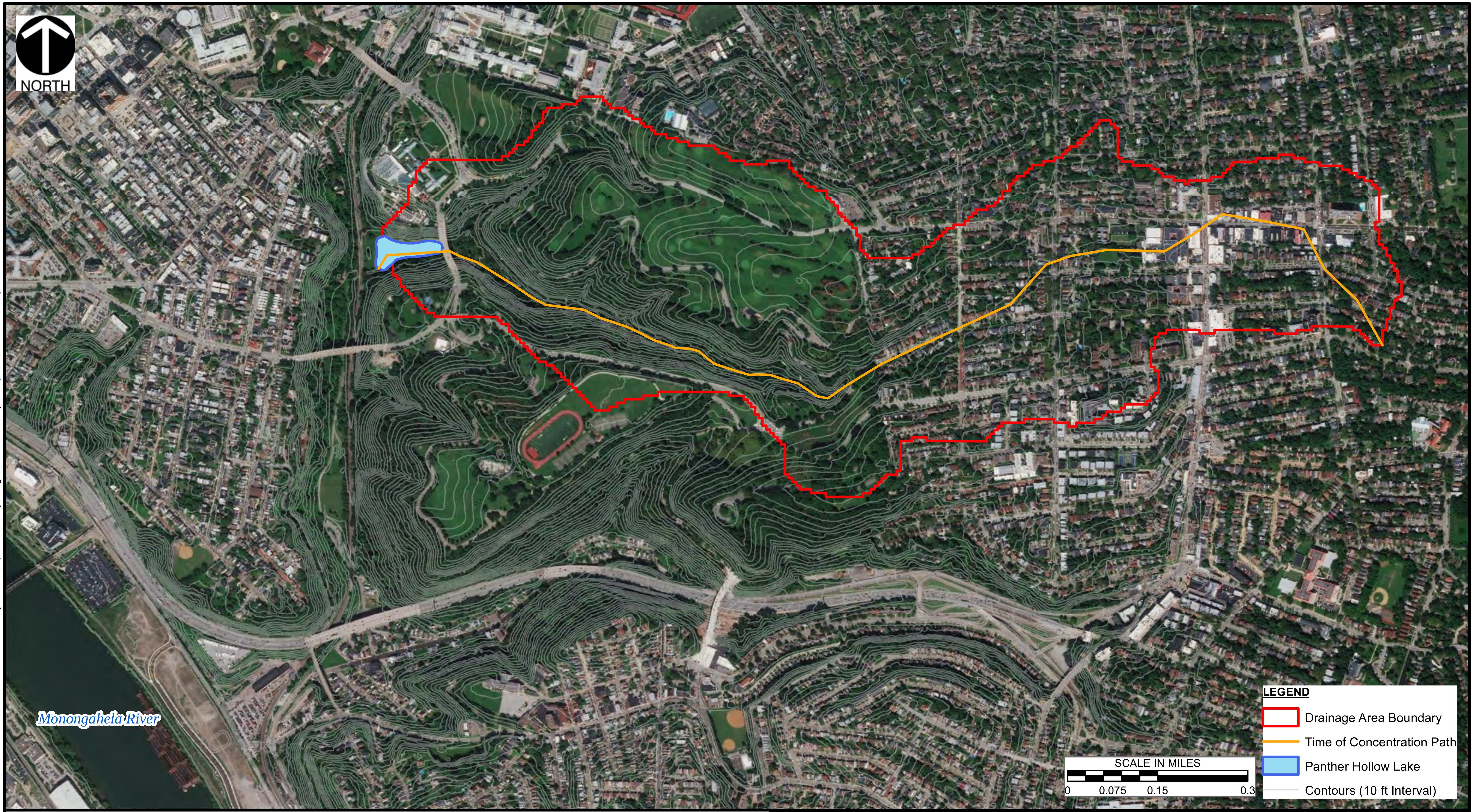
- Froehlich, David C., Peak Outflow from Breached Embankment Dam, ASCE Journal of Water Resources Planning Management, vol. 121 no. 1, p. 90-97, 1995.

APPENDIX B-1

WATERSHED MAP



REFERENCE

ESRI WORLD IMAGERY / ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD_IMAGERY, ACCESSED 10/9/2019, IMAGERY DATE: 2004.
SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE

Hydrologic Model Summary

1) Hydrologic modeling is completed utilizing Hydrologic Modeling System (HEC-HMS) version 4.3 by the U.S. Army Corps of Engineers.

2) Precipitation data obtained from the National Oceanic and Atmospheric Administration's Hydrometeorological Design Studies Center Precipitation Frequency Data Server.

3) Lag times for longest flow path calculated using the NRCS Lag Method.

Drainage Area Summary

DRAINAGE AREA TO RESSERVIOR
AREA = 387.79 AC OR 0.61 SQ. MILES
CURVE NUMBER = 84
TIME OF CONCENTRATION = 51.6 MIN.
LAG TIME = 31.0 MIN

CEC

Civil & Environmental Consultants, Inc.
117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067
615-333-7797 · 800-763-2326
www.cecinc.com

PITTSBURGH WATER & SEWER AUTHORITY
FOUR MILE RUN
STORMWATER IMPROVEMENT PROJECT
PITTSBURGH, ALLEGHENY COUNTY, PA

PANTHER HOLLOW LAKE DAM
HYDROLOGIC WATERSHED MAP

DRAWN BY: JTM	CHECKED BY: JS	APPROVED BY: PJS	APPENDIX: B-1
DATE: 10/9/2019	SCALE: 1 " = 0.150 miles	PROJECT NO: 174-960	

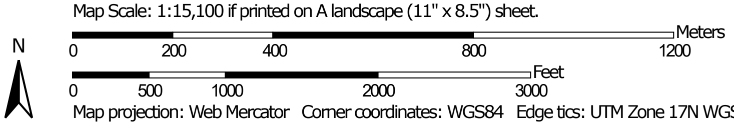
\\SVR-NASH M:\GENERAL DOCUMENTS\Water Resources\174-960\DamBreachAnalysis\-GIS\Maps\174960_Hydrologic_Watershed_Map.mxd (10/9/2019 1:02:11 PM)

APPENDIX B-2

NRCS WSS SOIL MAP RESULTS

Soil Map—Allegheny County, Pennsylvania
(Export_Output)

Map Scale: 1:15,100 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Allegheny County, Pennsylvania
Survey Area Data: Version 14, Sep 18, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 27, 2011—Aug 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GlB C	Gilpin silt loam, 3 to 8 percent slopes	28.6	7.4%
GlC C	Gilpin silt loam, 8 to 15 percent slopes	0.0	0.0%
GlD C	Gilpin silt loam, 15 to 25 percent slopes	17.3	4.5%
GpB C	Gilpin-Upshur complex, 3 to 8 percent slopes	1.7	0.4%
GpC C	Gilpin-Upshur complex, 8 to 15 percent slopes	56.3	14.5%
GpD C	Gilpin-Upshur complex, 15 to 25 percent slopes	4.6	1.2%
GQF C	Gilpin-Upshur complex, very steep	57.3	14.8%
GSF C	Gilpin, Weikert, Culleoka channery silt loams and 25 to 80 percent slopes	12.7	3.3%
UaB C	Upshur silty clay loam, 3 to 8 percent slopes	0.7	0.2%
UB D	Urban land	7.6	2.0%
UCB D	Urban land-Culleoka complex, gently sloping	110.4	28.5%
UCD D	Urban land-Culleoka complex, moderately steep	79.5	20.5%
URB D	Urban land-Rainsboro complex, gently sloping	8.6	2.2%
W D	Water	2.3	0.6%
Totals for Area of Interest		**387.6**	**100.0%**

APPENDIX B-3

T_C INPUTS AND CALCULATION RESULTS

Summary for Subcatchment 1S: Panther Lake Watershed

Runoff = 1.14 cfs @ 12.51 hrs, Volume= 0.147 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-yr Rainfall=4.89"

	Area (ac)	CN	Description
*	0.606	84	Drainage to Pather Lake
	0.606		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.6	10,544	0.1266	3.41		**Lag/CN Method,**

APPENDIX B-4

PMP RAINFALL DEPTH MAPS

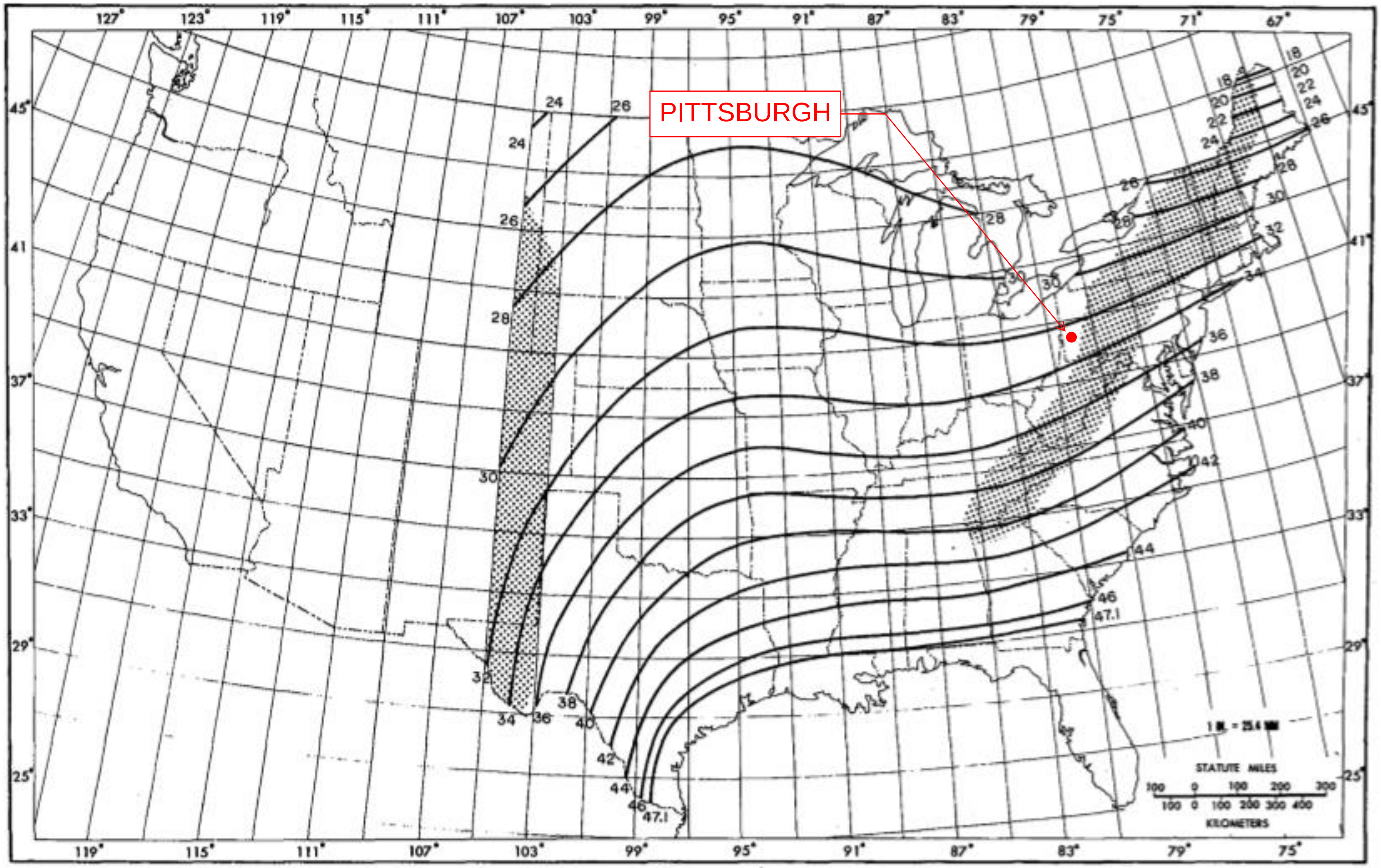


Figure 20.--All-season PMP (in.) for 24 hr 10 mi^2 (26 km^2).

APPENDIX B-5

PMP HEC-HMS ANALYSIS RESULTS

Project: 174960_PantherLake_P_DamBre   Simulation Run: BaseModel - PMF
Junction: Panther Lake Outflow

Start of Run:	11Sep2019, 00:00	Basin Model:	Base Model - Panther Lake
End of Run:	12Sep2019, 00:00	Meteorologic Model:	24 hr PMP
Compute Time:	15Oct2019, 03:47:07	Control Specifications:	11Sep2019-12Sep2019

Volume Units: (●) IN ( ) AC-FT

Computed Results

Peak Discharge:	3762.01 (CFS)	Date/Time of Peak Discharge:	11Sep2019, 12:06
Volume:	29.62 (IN)		

Project: 174960_PantherLake_P_DamBre   Simulation Run: BaseModel - PMF
Reservoir: Panther Lake Reservior

Start of Run:	11Sep2019, 00:00	Basin Model:	Base Model - Panther Lake
End of Run:	12Sep2019, 00:00	Meteorologic Model:	24 hr PMP
Compute Time:	15Oct2019, 03:47:07	Control Specifications:	11Sep2019-12Sep2019

Volume Units: (●) IN ( ) AC-FT

Computed Results

Peak Inflow:	3763.10 (CFS)	Date/Time of Peak Inflow:	11Sep2019, 12:02
Peak Discharge:	3721.53 (CFS)	Date/Time of Peak Discharge:	11Sep2019, 12:06
Inflow Volume:	30.26 (IN)	Peak Storage:	43.29 (AC-FT)
Discharge Volume:	27.55 (IN)	Peak Elevation:	816.05 (FT)

Project: 174960_PantherLake_P_DamBre   Simulation Run: BaseModel - PMF
Reservoir: Panther Lake Reservior

Start of Run:	11Sep2019, 00:00	Basin Model:	Base Model - Panther Lake
End of Run:	12Sep2019, 00:00	Meteorologic Model:	24 hr PMP
Compute Time:	15Oct2019, 03:47:07	Control Specifications:	11Sep2019-12Sep2019

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)	Stage (FT)
11Sep2019	11:40	3526.91	42.78	815.95	3458.70	815.95
11Sep2019	11:42	3559.57	42.85	815.96	3493.82	815.96
11Sep2019	11:44	3589.11	42.91	815.98	3525.73	815.98
11Sep2019	11:46	3615.79	42.98	815.99	3554.60	815.99
11Sep2019	11:48	3639.98	43.03	816.00	3580.92	816.00
11Sep2019	11:50	3662.03	43.08	816.01	3606.28	816.01
11Sep2019	11:52	3682.19	43.12	816.02	3628.00	816.02
11Sep2019	11:54	3700.63	43.15	816.03	3647.64	816.03
11Sep2019	11:56	3717.43	43.19	816.03	3665.54	816.03
11Sep2019	11:58	3732.71	43.22	816.04	3681.85	816.04
11Sep2019	12:00	3746.59	43.24	816.05	3696.68	816.05
11Sep2019	12:02	3757.28	43.27	816.05	3709.32	816.05
11Sep2019	12:04	3763.10	43.28	816.05	3718.21	816.05
11Sep2019	12:06	3762.03	43.29	816.05	3721.53	816.05
11Sep2019	12:08	3753.30	43.28	816.05	3717.81	816.05
11Sep2019	12:10	3735.97	43.26	816.05	3706.13	816.05
11Sep2019	12:12	3708.48	43.22	816.04	3685.28	816.04
11Sep2019	12:14	3668.93	43.16	816.03	3653.59	816.03
11Sep2019	12:16	3615.27	43.08	816.01	3609.16	816.01
11Sep2019	12:18	3545.75	42.97	815.99	3552.04	815.99
11Sep2019	12:20	3460.91	42.82	815.96	3481.16	815.96
11Sep2019	12:22	3363.02	42.64	815.92	3394.01	815.92
11Sep2019	12:24	3254.65	42.43	815.88	3294.19	815.88
11Sep2019	12:26	3138.30	42.20	815.83	3184.42	815.83
11Sep2019	12:28	3016.49	41.96	815.78	3067.29	815.78
11Sep2019	12:30	2892.16	41.70	815.73	2945.47	815.73
11Sep2019	12:32	2767.20	41.45	815.67	2821.44	815.67
11Sep2019	12:34	2642.19	41.19	815.62	2696.69	815.62
11Sep2019	12:36	2519.49	40.93	815.56	2572.69	815.56
11Sep2019	12:38	2401.74	40.67	815.51	2451.73	815.51

APPENDIX B-6

NOAA CHART OF THE 100-YEAR FREQUENCY STORM RAINFALL DATA

NOAA Atlas 14, Volume 2, Version 3
Location name: Pittsburgh, Pennsylvania, USA*
Latitude: 40.4368°, Longitude: -79.9488°
Elevation: 802.56 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.315 (0.285-0.348)	0.376 (0.340-0.416)	0.455 (0.411-0.504)	0.516 (0.465-0.569)	0.593 (0.533-0.654)	0.652 (0.585-0.718)	0.709 (0.633-0.779)	0.768 (0.682-0.843)	0.845 (0.747-0.926)	0.903 (0.795-0.989)
10-min	0.489 (0.443-0.541)	0.587 (0.531-0.649)	0.707 (0.639-0.783)	0.796 (0.717-0.878)	0.907 (0.815-1.00)	0.989 (0.886-1.09)	1.07 (0.952-1.17)	1.15 (1.02-1.26)	1.24 (1.10-1.36)	1.31 (1.16-1.44)
15-min	0.600 (0.543-0.664)	0.717 (0.649-0.794)	0.868 (0.785-0.961)	0.979 (0.882-1.08)	1.12 (1.01-1.24)	1.22 (1.10-1.35)	1.33 (1.18-1.46)	1.43 (1.27-1.57)	1.55 (1.37-1.70)	1.64 (1.45-1.80)
30-min	0.794 (0.718-0.878)	0.960 (0.869-1.06)	1.19 (1.07-1.32)	1.36 (1.23-1.50)	1.58 (1.42-1.75)	1.75 (1.57-1.93)	1.92 (1.71-2.10)	2.08 (1.85-2.28)	2.30 (2.03-2.52)	2.46 (2.17-2.70)
60-min	0.969 (0.877-1.07)	1.18 (1.07-1.30)	1.49 (1.35-1.65)	1.73 (1.56-1.91)	2.05 (1.84-2.26)	2.31 (2.07-2.54)	2.56 (2.28-2.81)	2.82 (2.51-3.10)	3.18 (2.81-3.48)	3.46 (3.05-3.79)
2-hr	1.12 (1.02-1.23)	1.36 (1.24-1.49)	1.71 (1.56-1.88)	1.99 (1.80-2.17)	2.36 (2.14-2.58)	2.66 (2.41-2.90)	2.97 (2.67-3.23)	3.30 (2.95-3.57)	3.73 (3.31-4.03)	4.08 (3.60-4.40)
3-hr	1.19 (1.09-1.30)	1.43 (1.31-1.57)	1.80 (1.65-1.97)	2.09 (1.91-2.29)	2.50 (2.27-2.72)	2.82 (2.55-3.07)	3.16 (2.85-3.44)	3.52 (3.15-3.81)	4.01 (3.56-4.33)	4.40 (3.88-4.74)
6-hr	1.42 (1.31-1.55)	1.70 (1.57-1.87)	2.12 (1.95-2.32)	2.46 (2.25-2.69)	2.94 (2.69-3.20)	3.34 (3.03-3.62)	3.75 (3.38-4.06)	4.18 (3.75-4.51)	4.79 (4.26-5.16)	5.28 (4.65-5.67)
12-hr	1.66 (1.53-1.82)	1.99 (1.83-2.18)	2.46 (2.26-2.69)	2.84 (2.60-3.10)	3.39 (3.09-3.69)	3.85 (3.49-4.17)	4.33 (3.90-4.68)	4.84 (4.33-5.21)	5.56 (4.92-5.97)	6.15 (5.40-6.58)
24-hr	1.98 (1.86-2.13)	2.36 (2.22-2.53)	2.88 (2.70-3.09)	3.31 (3.10-3.55)	3.91 (3.65-4.18)	4.41 (4.10-4.71)	4.93 (4.57-5.25)	5.47 (5.05-5.81)	6.23 (5.71-6.61)	6.85 (6.24-7.25)
2-day	2.31 (2.17-2.47)	2.75 (2.58-2.94)	3.33 (3.13-3.56)	3.80 (3.56-4.06)	4.45 (4.16-4.74)	4.98 (4.64-5.30)	5.52 (5.13-5.87)	6.08 (5.63-6.46)	6.86 (6.31-7.27)	7.47 (6.83-7.92)
3-day	2.48 (2.34-2.65)	2.95 (2.78-3.15)	3.54 (3.34-3.78)	4.03 (3.79-4.29)	4.70 (4.40-5.00)	5.24 (4.89-5.56)	5.79 (5.40-6.15)	6.36 (5.91-6.74)	7.14 (6.59-7.56)	7.76 (7.13-8.21)
4-day	2.66 (2.51-2.82)	3.14 (2.97-3.35)	3.76 (3.55-4.00)	4.26 (4.01-4.52)	4.94 (4.65-5.25)	5.50 (5.15-5.83)	6.06 (5.67-6.42)	6.64 (6.18-7.02)	7.43 (6.88-7.85)	8.05 (7.42-8.51)
7-day	3.18 (3.02-3.35)	3.75 (3.56-3.96)	4.42 (4.20-4.67)	4.96 (4.71-5.23)	5.69 (5.38-5.99)	6.27 (5.91-6.59)	6.84 (6.44-7.19)	7.43 (6.96-7.80)	8.20 (7.65-8.61)	8.79 (8.16-9.24)
10-day	3.65 (3.48-3.84)	4.30 (4.09-4.53)	5.02 (4.78-5.29)	5.60 (5.32-5.89)	6.37 (6.04-6.69)	6.96 (6.60-7.32)	7.56 (7.14-7.94)	8.15 (7.68-8.56)	8.92 (8.38-9.37)	9.50 (8.90-9.98)
20-day	5.11 (4.88-5.37)	5.99 (5.72-6.30)	6.91 (6.59-7.26)	7.63 (7.27-8.01)	8.57 (8.15-8.99)	9.30 (8.83-9.75)	10.0 (9.48-10.5)	10.7 (10.1-11.2)	11.6 (10.9-12.1)	12.2 (11.5-12.8)
30-day	6.42 (6.14-6.74)	7.50 (7.17-7.88)	8.57 (8.19-9.00)	9.41 (8.99-9.87)	10.5 (10.0-11.0)	11.3 (10.8-11.9)	12.1 (11.5-12.7)	12.9 (12.2-13.5)	13.9 (13.1-14.5)	14.6 (13.7-15.3)
45-day	8.21 (7.87-8.56)	9.57 (9.16-9.99)	10.8 (10.3-11.3)	11.7 (11.2-12.3)	13.0 (12.4-13.5)	13.8 (13.2-14.4)	14.7 (14.0-15.3)	15.5 (14.7-16.1)	16.4 (15.6-17.2)	17.1 (16.2-17.9)
60-day	9.90 (9.52-10.3)	11.5 (11.1-12.0)	12.9 (12.4-13.4)	13.9 (13.4-14.5)	15.2 (14.6-15.9)	16.2 (15.5-16.8)	17.1 (16.4-17.8)	17.9 (17.1-18.6)	18.9 (18.1-19.6)	19.6 (18.7-20.4)

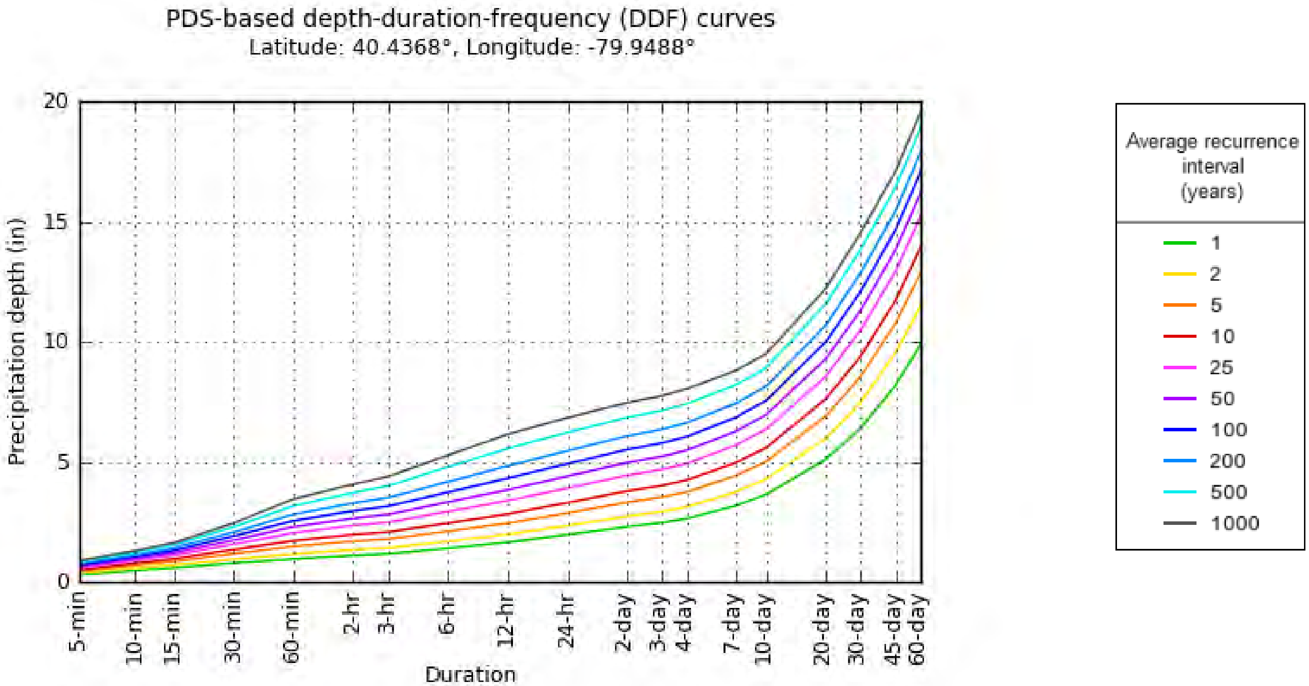
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

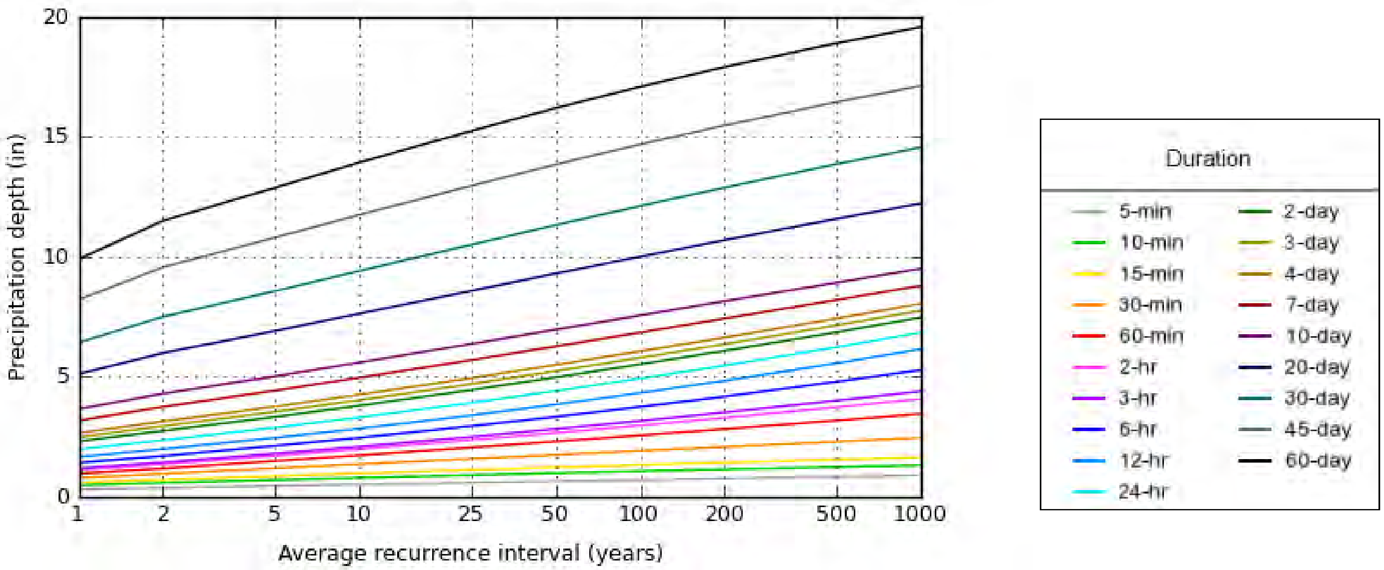
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical





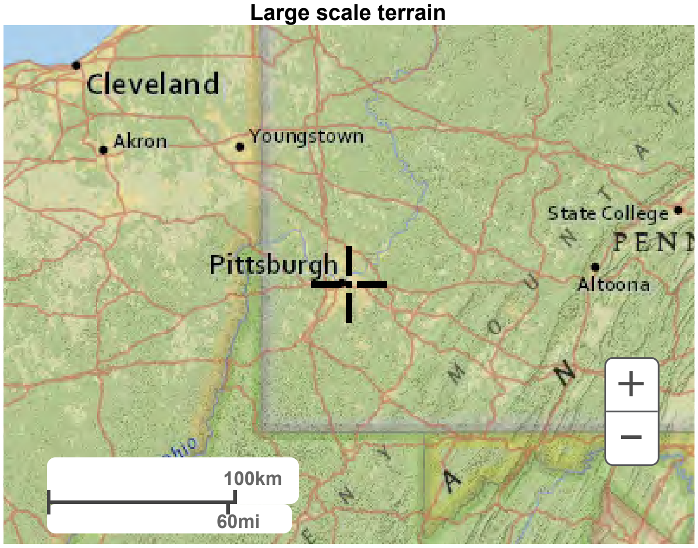
NOAA Atlas 14, Volume 2, Version 3 Created (GMT): Mon Sep 23 19:31:08 2019

Back to Top

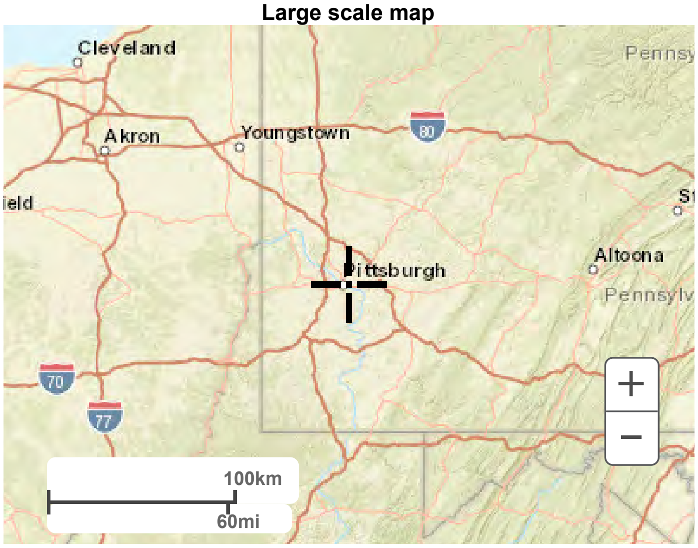
Maps & aerials

Small scale terrain

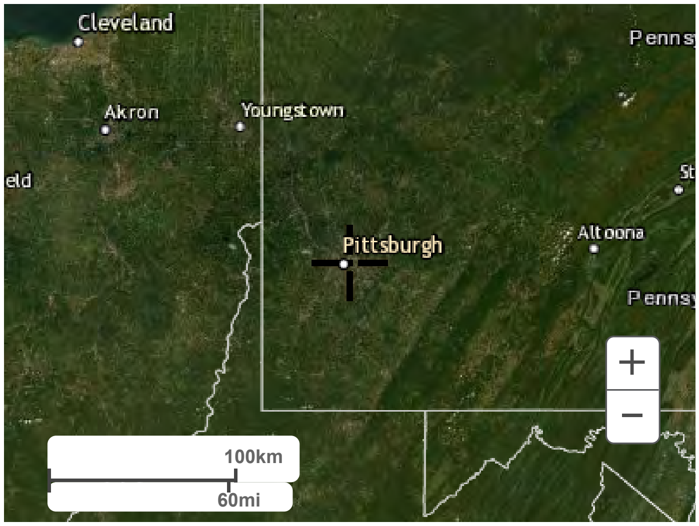
Large scale terrain



Large scale map



Large scale aerial



Back to Top

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX B-7

100-YEAR FREQUENCY EVENT HEC-HMS ANALYSIS RESULTS

Project: 174960_PantherLake_P_DamBre Simulation Run: BaseModel - 100YR
Junction: Panther Lake Outflow

Start of Run: 11Sep2019, 00:00
End of Run: 12Sep2019, 00:00
Compute Time: 15Oct2019, 03:47:12

Basin Model: Base Model - Panther Lake
Meteorologic Model: 100-YR/24-HR
Control Specifications: 11Sep2019-12Sep2019

Volume Units: IN AC-FT

Computed Results

Peak Discharge: 699.70 (CFS)
Volume: 2.85 (IN)
Date/Time of Peak Discharge: 11Sep2019, 12:34

Project: 174960_PantherLake_P_DamBre Simulation Run: BaseModel - 100YR
Reservoir: Panther Lake Reservior

Start of Run: 11Sep2019, 00:00
End of Run: 12Sep2019, 00:00
Compute Time: 15Oct2019, 03:47:12

Basin Model: Base Model - Panther Lake
Meteorologic Model: 100-YR/24-HR
Control Specifications: 11Sep2019-12Sep2019

Volume Units: IN AC-FT

Computed Results

Peak Inflow: 787.41 (CFS)
Peak Discharge: 660.69 (CFS)
Inflow Volume: 3.18 (IN)
Discharge Volume: 1.56 (IN)
Date/Time of Peak Inflow: 11Sep2019, 12:22
Date/Time of Peak Discharge: 11Sep2019, 12:34
Peak Storage: 35.72 (AC-FT)
Peak Elevation: 814.48 (FT)

Project: 174960_PantherLake_P_DamBre Simulation Run: BaseModel - 100YR
Reservoir: Panther Lake Reservior

Start of Run: 11Sep2019, 00:00
End of Run: 12Sep2019, 00:00
Compute Time: 15Oct2019, 03:47:12

Basin Model: Base Model - Panther Lake
Meteorologic Model: 100-YR/24-HR
Control Specifications: 11Sep2019-12Sep2019

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)	Stage (FT)
11Sep2019	12:12	637.42	23.15	811.29	0.00	811.29
11Sep2019	12:14	686.35	24.88	811.80	0.00	811.80
11Sep2019	12:16	726.60	26.71	812.31	14.94	812.31
11Sep2019	12:18	756.80	28.56	812.81	53.64	812.81
11Sep2019	12:20	776.60	30.35	813.26	106.27	813.26
11Sep2019	12:22	786.51	32.03	813.67	165.34	813.67
11Sep2019	12:24	787.41	33.54	814.03	245.90	814.03
11Sep2019	12:26	780.25	34.61	814.25	449.50	814.25
11Sep2019	12:28	766.09	35.23	814.38	566.28	814.38
11Sep2019	12:30	746.07	35.55	814.45	628.04	814.45
11Sep2019	12:32	721.21	35.70	814.48	655.68	814.48
11Sep2019	12:34	692.31	35.72	814.48	660.69	814.48
11Sep2019	12:36	660.05	35.67	814.47	650.93	814.47
11Sep2019	12:38	625.21	35.57	814.45	631.31	814.45
11Sep2019	12:40	588.78	35.43	814.42	605.05	814.42
11Sep2019	12:42	551.91	35.27	814.39	574.49	814.39
11Sep2019	12:44	515.81	35.10	814.35	541.49	814.35
11Sep2019	12:46	481.56	34.92	814.31	507.60	814.31
11Sep2019	12:48	449.96	34.74	814.28	474.12	814.28
11Sep2019	12:50	421.37	34.57	814.24	442.06	814.24
11Sep2019	12:52	395.72	34.42	814.21	412.07	814.21
11Sep2019	12:54	372.56	34.27	814.18	384.41	814.18
11Sep2019	12:56	351.35	34.14	814.15	359.03	814.15
11Sep2019	12:58	331.65	34.01	814.13	335.70	814.13
11Sep2019	13:00	313.26	33.90	814.10	314.16	814.10
11Sep2019	13:02	296.10	33.80	814.08	294.20	814.08
11Sep2019	13:04	280.09	33.70	814.06	275.64	814.06
11Sep2019	13:06	265.16	33.61	814.04	258.37	814.04
11Sep2019	13:08	251.25	33.52	814.02	242.29	814.02
11Sep2019	13:10	238.35	33.44	814.01	227.33	814.01

Project: 174960_PantherLake_P_DamBre   Simulation Run: BaseModel - 50YR
Junction: Panther Lake Outflow

Start of Run: 11Sep2019, 00:00   Basin Model: Base Model - Panther Lake
End of Run: 12Sep2019, 00:00   Meteorologic Model: 50-YR/24-HR
Compute Time: 15Oct2019, 03:47:14   Control Specifications: 11Sep2019-12Sep2019

Volume Units: (•) IN ( ) AC-FT

Computed Results

Peak Discharge: 544.57 (CFS)   Date/Time of Peak Discharge: 11Sep2019, 12:38
Volume: 2.43 (IN)

Project: 174960_PantherLake_P_DamBre   Simulation Run: BaseModel - 50YR
Reservoir: Panther Lake Reservior

Start of Run: 11Sep2019, 00:00   Basin Model: Base Model - Panther Lake
End of Run: 12Sep2019, 00:00   Meteorologic Model: 50-YR/24-HR
Compute Time: 15Oct2019, 03:47:14   Control Specifications: 11Sep2019-12Sep2019

Volume Units: (•) IN ( ) AC-FT

Computed Results

Peak Inflow: 672.41 (CFS)   Date/Time of Peak Inflow: 11Sep2019, 12:22
Peak Discharge: 505.72 (CFS)   Date/Time of Peak Discharge: 11Sep2019, 12:38
Inflow Volume: 2.71 (IN)   Peak Storage: 34.91 (AC-FT)
Discharge Volume: 1.19 (IN)   Peak Elevation: 814.31 (FT)

Project: 174960_PantherLake_P_DamBre   Simulation Run: BaseModel - 50YR
Reservoir: Panther Lake Reservior

Start of Run: 11Sep2019, 00:00   Basin Model: Base Model - Panther Lake
End of Run: 12Sep2019, 00:00   Meteorologic Model: 50-YR/24-HR
Compute Time: 15Oct2019, 03:47:14   Control Specifications: 11Sep2019-12Sep2019

Date	Time	Inflow (CFS)	Storage (AC-FT)	Elevation (FT)	Outflow (CFS)	Stage (FT)
11Sep2019	12:08	441.98	17.96	809.63	0.00	809.63
11Sep2019	12:10	492.83	19.15	810.04	0.00	810.04
11Sep2019	12:12	540.63	20.48	810.47	0.00	810.47
11Sep2019	12:14	583.02	21.93	810.93	0.00	810.93
11Sep2019	12:16	618.04	23.48	811.39	0.00	811.39
11Sep2019	12:18	644.48	25.12	811.87	0.00	811.87
11Sep2019	12:20	662.01	26.80	812.33	16.20	812.33
11Sep2019	12:22	671.08	28.45	812.78	50.81	812.78
11Sep2019	12:24	672.41	30.00	813.18	95.09	813.18
11Sep2019	12:26	666.83	31.41	813.52	140.71	813.52
11Sep2019	12:28	655.22	32.67	813.82	191.18	813.82
11Sep2019	12:30	638.55	33.73	814.07	281.86	814.07
11Sep2019	12:32	617.70	34.39	814.20	407.42	814.20
11Sep2019	12:34	593.34	34.73	814.28	472.64	814.28
11Sep2019	12:36	566.06	34.88	814.31	500.96	814.31
11Sep2019	12:38	536.51	34.91	814.31	505.72	814.31
11Sep2019	12:40	505.55	34.86	814.30	495.95	814.30
11Sep2019	12:42	474.15	34.76	814.28	477.31	814.28
11Sep2019	12:44	443.35	34.63	814.25	453.50	814.25
11Sep2019	12:46	414.10	34.50	814.23	427.13	814.23
11Sep2019	12:48	387.09	34.35	814.20	400.04	814.20
11Sep2019	12:50	362.66	34.21	814.17	373.53	814.17
11Sep2019	12:52	340.74	34.08	814.14	348.41	814.14
11Sep2019	12:54	320.94	33.96	814.11	325.07	814.11
11Sep2019	12:56	302.80	33.85	814.09	303.56	814.09
11Sep2019	12:58	285.96	33.74	814.07	283.72	814.07
11Sep2019	13:00	270.22	33.64	814.05	265.37	814.05
11Sep2019	13:02	255.53	33.55	814.03	248.32	814.03
11Sep2019	13:04	241.83	33.47	814.01	232.47	814.01
11Sep2019	13:06	229.04	33.39	814.00	220.04	814.00

APPENDIX B-8

PROPOSED RESERVOIR STAGE-STORAGE TABLE

Elevation (feet)	Surface (acres)	Storage (acre-feet)
796.00	0.500	0.000
796.50	0.532	0.258
797.00	0.564	0.532
797.50	0.597	0.822
798.00	0.631	1.129
798.50	0.689	1.459
799.00	0.750	1.819
799.50	0.803	2.207
800.00	0.857	2.621
800.50	0.898	3.060
801.00	0.940	3.520
801.50	0.980	4.000
802.00	1.021	4.500
802.50	1.063	5.021
803.00	1.105	5.563
803.50	1.149	6.126
804.00	1.194	6.712
804.50	1.239	7.320
805.00	1.285	7.951
805.50	1.565	8.662
806.00	1.872	9.520
806.50	1.977	10.482
807.00	2.084	11.497
807.50	2.180	12.563
808.00	2.278	13.678
808.50	2.488	14.869
809.00	2.707	16.167
809.50	2.842	17.554
810.00	2.981	19.010
810.50	3.150	20.542
811.00	3.323	22.160
811.50	3.409	23.843
812.00	3.497	25.570
812.50	3.695	27.368
813.00	3.898	29.266
813.50	4.144	31.276
814.00	4.397	33.411
814.50	4.397	35.609
815.00	4.397	37.808
815.50	4.398	40.007
816.00	4.398	42.206
816.50	4.398	44.405
817.00	4.398	46.604
817.50	4.399	48.803
818.00	4.399	51.003
818.50	4.399	53.202
819.00	4.399	55.402
819.50	4.400	57.602
820.00	**4.400**	**59.802**

APPENDIX B-9

PROPOSED RESERVOIR DESIGN PLANS

CONSTRUCTION DRAWINGS
PANTHER HOLLOW LAKE REHABILITATION PROJECT
CITY OF PITTSBURGH, ALLEGHENY COUNTY, PENNSYLVANIA

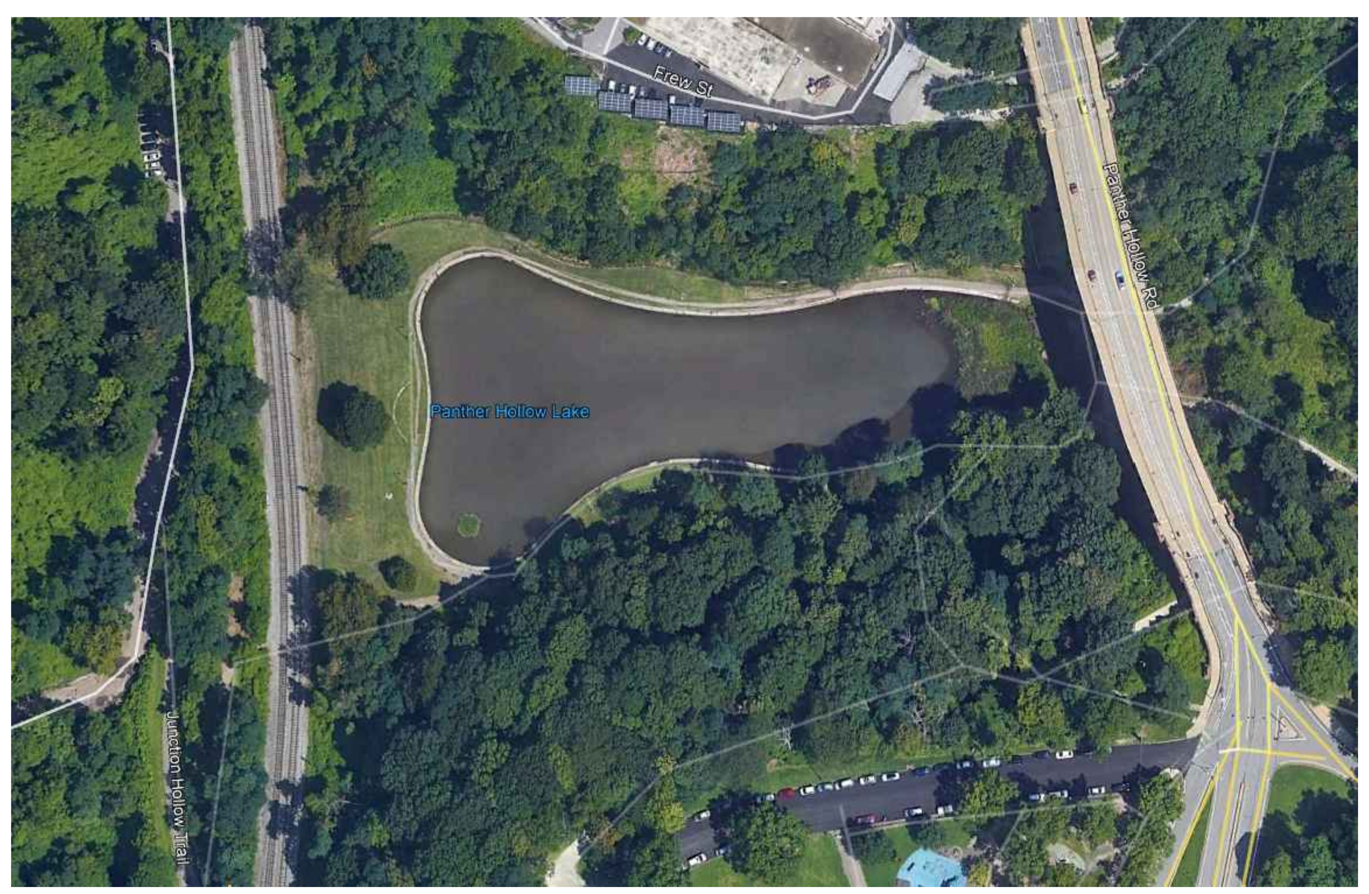
PREPARED FOR:
CITY OF PITTSBURGH, DEPARTMENT OF PUBLIC WORKS-PARKS MAINTENANCE DIVISION

AND

PITTSBURGH WATER & SEWER AUTHORITY
1200 PENN AVENUE
PITTSBURGH, PA 15222

OCTOBER 2019

NORTH



SITE AERIAL PHOTO

REFERENCE

1. AERIAL HAS BEEN GENERATED REFERENCING GOOGLE EARTH
2. APPROXIMATE SCALE 1"=500'

NORTH

VICINITY AERIAL PHOTO

REFERENCE

1. VICINITY MAP HAS BEEN GENERATED REFERENCING GOOGLE EARTH
2. APPROXIMATE SCALE 1"=2.5 MILE

DRAWING LIST

SHEET NO.	DESCRIPTION
G100	COVER SHEET
G101	GENERAL NOTES/LEGEND/ABBREVIATIONS
C100	EXISTING CONDITIONS PLAN
C200	SITE PREPARATION PLAN
C300	PROPOSED SITE GRADING PLAN
C301	LAKE EMBANKMENT PROFILE AND SECTION VIEWS - SHEET 1 OF 2
C302	LAKE EMBANKMENT PROFILE AND SECTION VIEWS - SHEET 2 OF 2
C400	PANTHER HOLLOW LAKE PRINCIPLE AND EMERGENCY SPILLWAY PLAN & PROFILE VIEW
C800	CONSTRUCTION DETAILS - SHEET 1 OF 4
C801	CONSTRUCTION DETAILS - SHEET 2 OF 4
C802	CONSTRUCTION DETAILS - SHEET 3 OF 3
C803	CONSTRUCTION DETAILS - SHEET 4 OF 4
C900	EROSION AND SEDIMENT CONTROL PLAN
C901	EROSION AND SEDIMENT CONTROL PLAN
C902	EROSION AND SEDIMENT CONTROL PLAN
C903	EROSION AND SEDIMENT CONTROL PLAN

PREPARED BY:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
333 BALDWIN ROAD
PITTSBURGH, PA 15205
412-429-2324
800-365-2324

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	CLR	CHECKED BY:	JAL	APPROVED BY:	PJS
DATE:	OCTOBER 2019	DWG SCALE:		PROJECT NO:	174-960

COVER SHEET
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: G100

GENERAL NOTES

1. BEFORE ANY EARTHWORK ACTIVITIES ARE ALLOWED TO BEGIN ONSITE, THE CONTRACTOR SHALL CONTACT THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-962-7962 OR 811 A MINIMUM OF 3 DAYS PRIOR TO EARTHWORK ACTIVITIES TO ALLOW THE UTILITY COMPANIES TO MARK THE LOCATIONS OF EXISTING LINES OWNED AND MAINTAINED BY THE UTILITY COMPANIES.

2. THE FOLLOWING PERMIT APPLICATIONS HAVE BEEN SUBMITTED FOR WORK TO BE PERFORMED UNDER THIS CONTRACT. THE OWNER HAS RECEIVED PERMISSION FROM THE APPROPRIATE AGENCY TO PROCEED WITH WORK IN ADVANCE OF PERMIT APPROVAL. THE CONTRACTOR SHALL FOLLOW ALL STIPULATIONS OF THE PERMIT APPLICATIONS.

   A. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FROM PADEP FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

   B. STORMWATER POLLUTION PROTECTION PLAN (SWPPP).

   C. EROSION AND SEDIMENT CONTROL PLAN.

   D. PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) DAM PERMIT.

3. EXISTING TOPOGRAPHY AND DIMENSIONS WERE OBTAINED FROM A COMPILATION OF TOPOGRAPHIC GROUND SURVEY AND GIS DATA INFORMATION. TOPOGRAPHIC ELEVATIONS AND DIMENSIONS SHOULD BE VERIFIED IN THE FIELD AND INVERTS SHOULD BE CHECKED IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE OWNER AND THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

4. EXACT PLAN LOCATION, SURFACE ELEVATION, AND INVERT ELEVATION LOCATION OF ALL EXISTING UTILITIES SHOULD BE VERIFIED.

5. A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT, GRAVEL AREAS OR TOPOGRAPHY, AND NEW PAVEMENT, GRAVEL AREAS OR TOPOGRAPHY SHOULD BE PROVIDED. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY.

6. ONE SET OF AS-BUILT / RECORD DRAWINGS SHOULD BE MAINTAINED ON THE JOB SITE DURING CONSTRUCTION FOR DISTRIBUTION TO THE OWNER AND/OR OWNER'S REPRESENTATIVE UPON COMPLETION.

7. EARTHWORK SHALL INCLUDE CLEARING AND GRUBBING, STRIPPING AND STOCKPILING TOPSOIL, GRADING, EXCAVATION, FILLING, UNDERCUT AND REPLACEMENT, AND COMPACTION.

8. ALL AREAS NOT PAVED OR GRAVELED SHALL BE STABILIZED IN ACCORDANCE WITH THE SPECIFICATIONS, UNLESS NOTED OTHERWISE.

9. DISTANCES SHOWN ON PIPING ARE HORIZONTAL DISTANCES FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE, UNLESS OTHERWISE NOTED.

10. ALL STORMWATER MANAGEMENT FACILITIES, INCLUDING COLLECTION AND CONVEYANCE STRUCTURES, SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE STATE CODES AND REGULATIONS.

11. REFER TO AND FOLLOW THE RECOMMENDATIONS OF THE "GEOTECHNICAL ENGINEERING REPORT" PREPARED FOR THIS PROJECT BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION, TESTING AND FINAL ACCEPTANCE OF ALL NEW STORMWATER FACILITIES CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE REGULATING AGENCIES CONCERNING INSTALLATION, INSPECTION AND APPROVAL OF THE STORMWATER CONSTRUCTION.

LAYOUT GENERAL NOTES

1. CARE SHALL BE TAKEN TO PROTECT UTILITIES THAT ARE TO REMAIN. RELOCATE EXISTING UTILITIES AS INDICATED, OR AS NECESSARY FOR CONSTRUCTION. INSTALL ALL UTILITIES, INCLUDING CONDUITS, PRIOR TO INSTALLATION OF PAVED SURFACES.
2. PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY.
3. ALL DAMAGE TO EXISTING PAVEMENT TO REMAIN WHICH RESULTS FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED WITH LIKE MATERIALS AT THE CONTRACTOR'S EXPENSE.
4. CONTRACTOR SHALL ADJUST THE PROPOSED ELEVATION AT THE TOP OF EXCAVATION SLOPES AS NEEDED TO TIE INTO EXISTING GROUND.
5. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD.

DEMOLITION GENERAL NOTES

1. ALL UTILITY DISCONNECTION, REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY/AGENCY. UTILITY CONTACTS ARE LISTED BELOW.
2. CONTRACTOR SHALL PROTECT ALL CORNER PINS, MONUMENTS, PROPERTY CORNERS AND BENCHMARKS DURING DEMOLITION ACTIVITIES. IF DISTURBED, CONTRACTOR SHALL HAVE DISTURBED ITEMS RESET BY A LICENSED SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.
3. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES TO REMAIN. ANY ITEMS TO REMAIN THAT HAVE BEEN DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
4. CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND AS REQUIRED BY LOCAL AGENCIES WHEN WORKING IN AND/OR ALONG STREETS, ROADS, HIGHWAYS, ETC. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL AND COORDINATE WITH LOCAL AND/OR STATE AGENCIES REGARDING THE NEED, EXTENT AND LIMITATIONS ASSOCIATED WITH INSTALLING AND MAINTAINING TRAFFIC CONTROL MEASURES.
5. PROVIDE NEAT, STRAIGHT, FULL DEPTH, SAW CUTS OF EXISTING PAVEMENT WHERE INDICATED ALONG LIMITS OF PAVEMENT DEMOLITION.
6. ALL UTILITY AND STRUCTURE REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED AND PROPERLY DOCUMENTED BY A CERTIFIED PROFESSIONAL, WHEN APPLICABLE, WITH THE APPROPRIATE UTILITY COMPANY, MUNICIPALITY AND/OR AGENCY.
7. NO TREES SHALL BE REMOVED, NOR VEGETATION DISTURBED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
8. THE CONTRACTOR SHALL USE SUITABLE METHODS TO CONTROL DUST AND DIRT CAUSED BY THE DEMOLITION ACTIVITY.

UTILITY GENERAL NOTES

1. ALL PROPOSED UTILITY LINES AND EXTENSIONS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH ALL APPLICABLE UTILITY COMPANY SPECIFICATIONS. CONTRACTOR SHALL COORDINATE UTILITY DISCONNECTIONS WITH THE APPROPRIATE AGENCY.

2. THE CONTRACTOR IS PARTICULARLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON IS BASED ON TOPOGRAPHIC SURVEYS AND RECORD DRAWINGS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR INSTRUCTIONS. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS.

3. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED UTILITY WORK PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

4. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES AND UNDERGROUND ELECTRIC CONDUITS DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO PAVEMENT CONSTRUCTION.

5. ADJUST ALL EXISTING UTILITY SURFACE FEATURES INCLUDING BUT NOT LIMITED TO CASTINGS, VALVE BOXES, PEDESTALS, CLEANOUTS, ETC. TO MATCH PROPOSED FINISHED GRADES, UNLESS OTHERWISE INDICATED.

6. CONTRACTOR IS TO COORDINATE WITH EACH UTILITY PROVIDER REGARDING INSTALLATION OF UTILITY CONDUITS FOR ELECTRICAL WORK. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR FOR THE TRENCHING AND CONDUIT INSTALLATION. COST FOR INSTALLATION AND MATERIALS SHALL BE INCLUDED IN VARIOUS BID ITEMS.

DATUM AND TOPOGRAPHIC SURVEY

VERTICAL DATUM: NAVD88 (GEIOD 12A)

HORIZONTAL DATUM: NAD83 NORTH ZONE (2011)

BENCHMARKS TABLE:

CONTROL POINTS			
CONTROL POINT NO.	NORTHING	EASTING	ELEVATION
16	1356619.682'	409503.329'	811.576'
17	1357146.573'	409614.972'	816.632'
1000	1356377.623'	409670.92'	808.985'
1001	1356664.538'	409548.924'	806.256'

DATUM NOTES:

1. SITE BENCHMARKS OBTAINED FROM AWK CONSULTING ENGINEERS, INC. USING GROUND SURVEY TECHNIQUES IN MAY 2018.

REFERENCE
1. PANTHER HOLLOW LAKE BATHYMETRICAL SURVEY PERFORMED BY AWK CONSULTING ENGINEERS, INC., DATED OCTOBER 2017.
2. POTHOLING UTILITY INVESTIGATION PERFORMED BY TERRA TESTING INC., DATED OCTOBER AND NOVEMBER 2018.
3. EXISTING TOPOGRAPHY AND CONTOURS DERIVED FROM PHOTOGRAMETRY SURVEY PERFORMED BY LAND MAPPING, INC. DATED NOVEMBER 2016, AWK CONSULTING ENGINEERS, INC. FIELD SURVEY, DATED JUNE 2018, CIVIL & ENVIRONMENTAL CONSULTANTS, INC. FIELD SURVEY, DATED JULY-AUGUST 2018, AND ALLEGHENY COUNTY, PA LIDAR, DATED 2017.
4. STREAM AND WETLAND DELINEATION PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. DATED MAY-JULY 2018.

STANDARD ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE
ALT	ALTERNATE
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
B.O.	BY OTHERS
℄	CENTERLINE
CIP	CAST-IN-PLACE, CAST IRON PIPE
CONC	CONCRETE
CWL	CONTRACTOR WORK LIMITS
CY	CUBIC YARD
DIA	DIAMETER
DWG	DRAWING
E&S	EROSION AND SEDIMENT
EL	ELEVATION
EXIST	EXISTING
FT	FOOT, FEET
GA	GAGE
HDPE	HIGH-DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
IN	INCH, INCHES
LB	POUND, POUNDS
LOD	LIMITS OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NO	NUMBER
NTS	NOT TO SCALE
O&M	OPERATION AND MAINTENANCE
OD	OUTSIDE DIAMETER
OPNG	OPENING
PA	PENNSYLVANIA
PI	POINT OF INTERSECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
REINF	REINFORCEMENT
REQ'D	REQUIRED
SCH	SCHEDULE
STA	STATION
STD	STANDARD
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
WP	WORK POINT

STANDARD LEGEND

EXISTING PROPERTY LINE
EXISTING BUILDING
EXISTING AUXILIARY BUILDING
820
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
EXISTING CURB
EXISTING EDGE ROAD
EXISTING EDGE OF SIDEWALK
EXISTING EDGE OF CONCRETE TRAIL
EXISTING EDGE OF UNPAVED TRAIL
EXISTING EDGE OF PAVED DRIVEWAY
EXISTING ROAD CENTERLINE
EXISTING BRIDGE
EXISTING RAILROAD
EXISTING WALL
EXISTING BODY OF WATER
EXISTING STREAM
EXISTING GUIDERAIL
EXISTING FENCE
EXISTING TREE/SHRUB LINE
EXISTING TREE
EXISTING POST/SIGN
EXISTING GIS WETLAND
PROPOSED PAVED LIMITS
PROPOSED ROADSIDE DITCH
PROPOSED WETLAND
780
PROPOSED INDEX CONTOUR
PROPOSED INTERMEDIATE CONTOUR
PROPOSED STORM SEWER LINE
PROPOSED RIPRAP OUTFALL APRON
PROPOSED HEADWALL/ENDWALL
W
PROPOSED WATERLINE
B-#
GEOTECHNICAL BORING LOCATION
PZ-#
PIEZOMETER INSTALLATION LOCATION
PROPOSED CONTRACTOR LIMITS OF DISTURBANCE

CONCRETE
EARTH
GRAVEL
RIPRAP

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DRAWN BY:	CLR	CHECKED BY:	JAL	APPROVED BY:	PJS
DATE:	OCTOBER 2019	DWG SCALE:	AS-SHOWN	PROJECT NO:	174-960

GENERAL NOTES/LEGEND/ABBREVIATIONS
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: G101

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SITE PREPARATION PLAN

SCALE: 1" = 30'

0 30 60

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EXISTING CONDITIONS PLAN
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: C100

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SITE PREPARATION PLAN

SCALE: 1" = 30'

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DATE:	OCTOBER 2019	DWG SCALE:	1"=30'	PROJECT NO:	174-960

SITE PREPARATION PLAN
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.:
C200

PANTHER HOLLOW LAKE AND FOREBAY POND PLAN

SCALE 1"=30'

0 30 60

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DATE: OCTOBER 2019	DWG SCALE: 1"=30'	PROJECT NO: 174-960

PROPOSED SITE GRADING PLAN
PANTHER HOLLOW LAKE DAM RESTORATION
AND FOREBAY POND

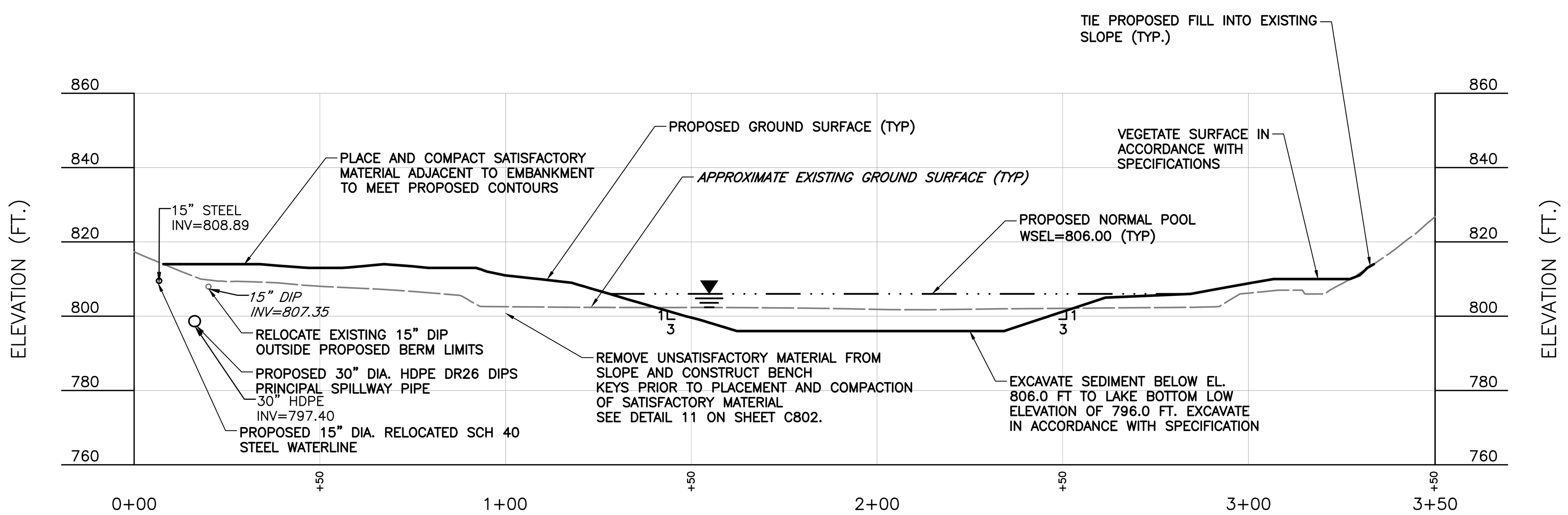
DRAWING NO.: **C300**

PANTHER HOLLOW LAKE - LONGITUDINAL SECTION A

SCALE H:1"=30'; V:1"=15'

SCALE IN FEET 0 30 60

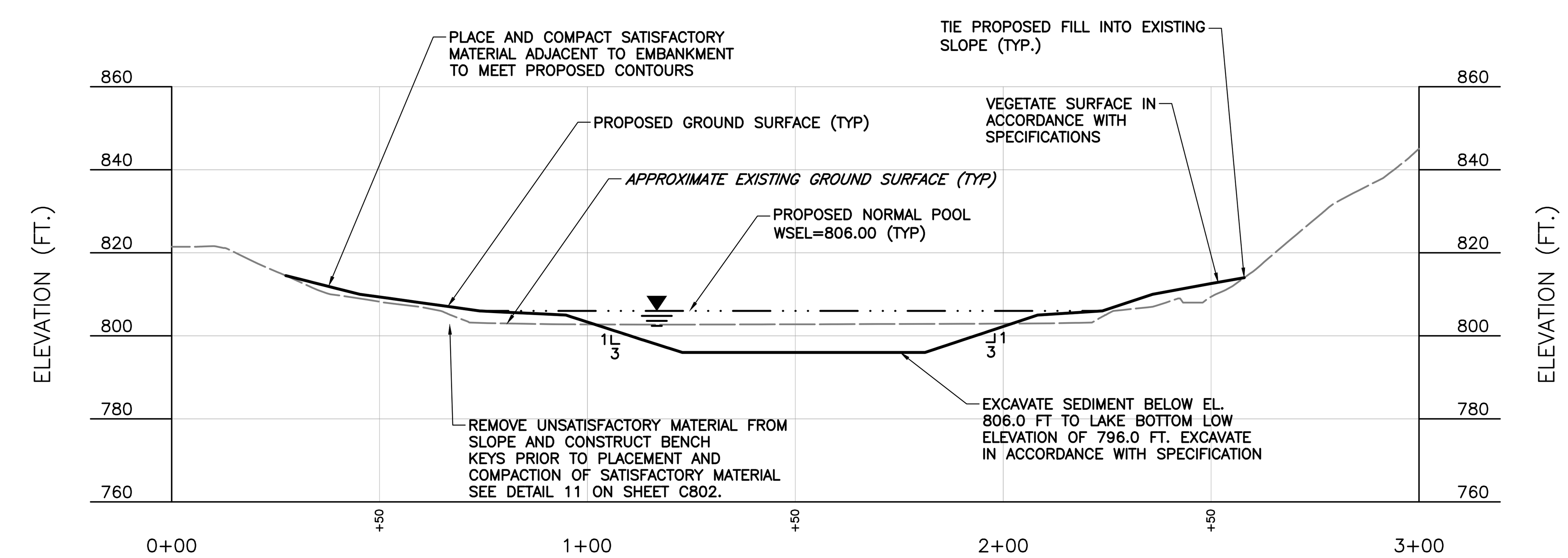
SCALE IN FEET 0 15 30



PANTHER HOLLOW LAKE - SECTION B

SCALE H:1"=30'; V:1"=30'

SCALE IN FEET 0 30 60



PANTHER HOLLOW LAKE - SECTION C

SCALE H:1"=30'; V:1"=30'

SCALE IN FEET 0 30 60

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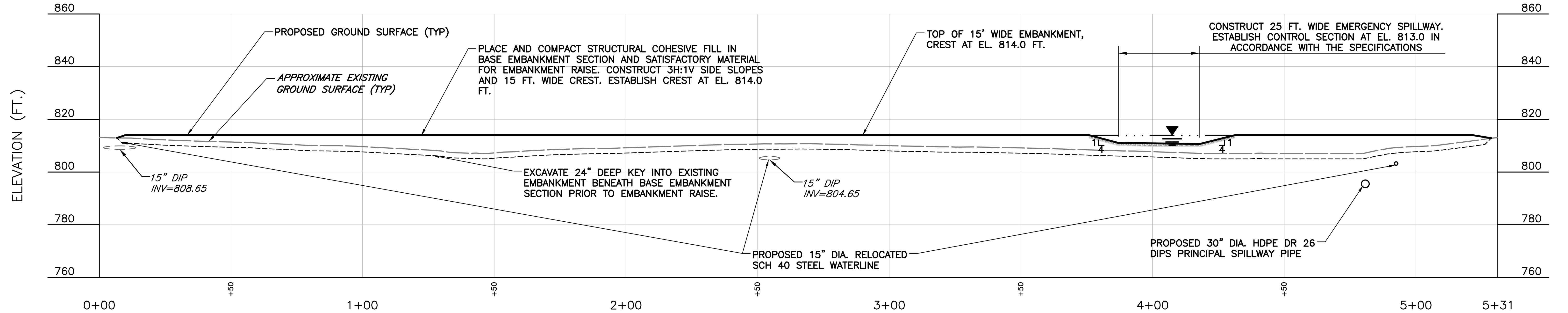
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

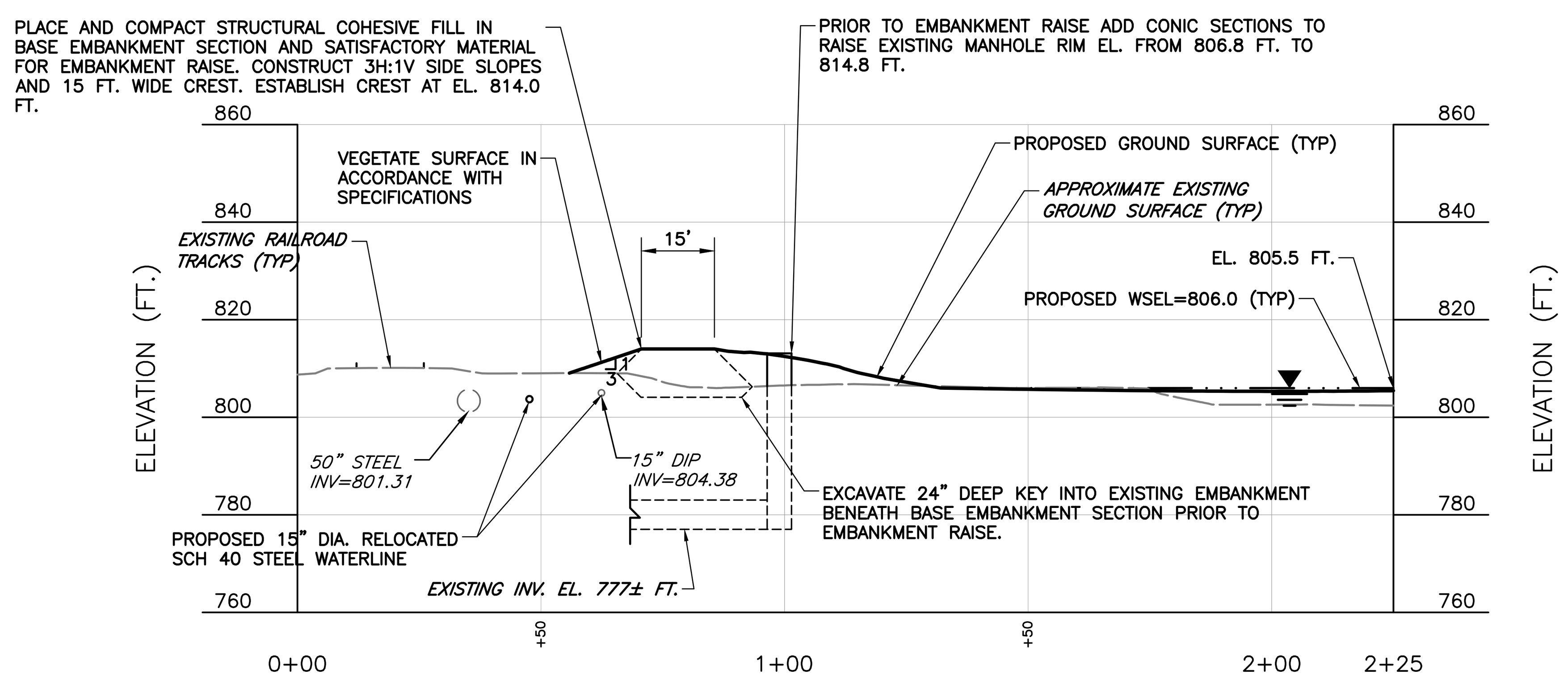
PANTHER HOLLOW LAKE SECTION VIEWS
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: C301



PANTHER HOLLOW LAKE - EMBANKMENT PROFILE

SCALE H:1"=30'; V:1"=30'



LAKE EMBANKMENT - SECTION D

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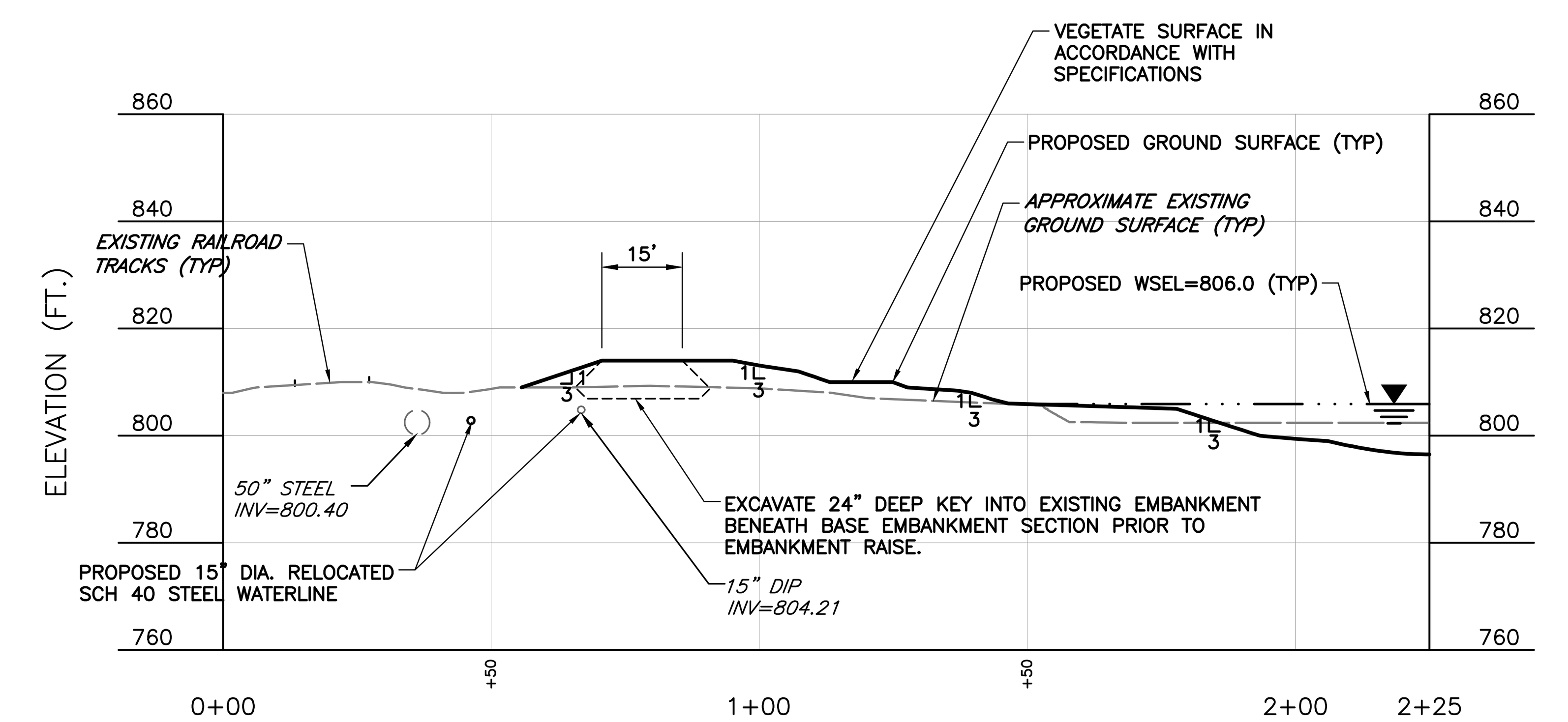

LAKE EMBANKMENT - SECTION E

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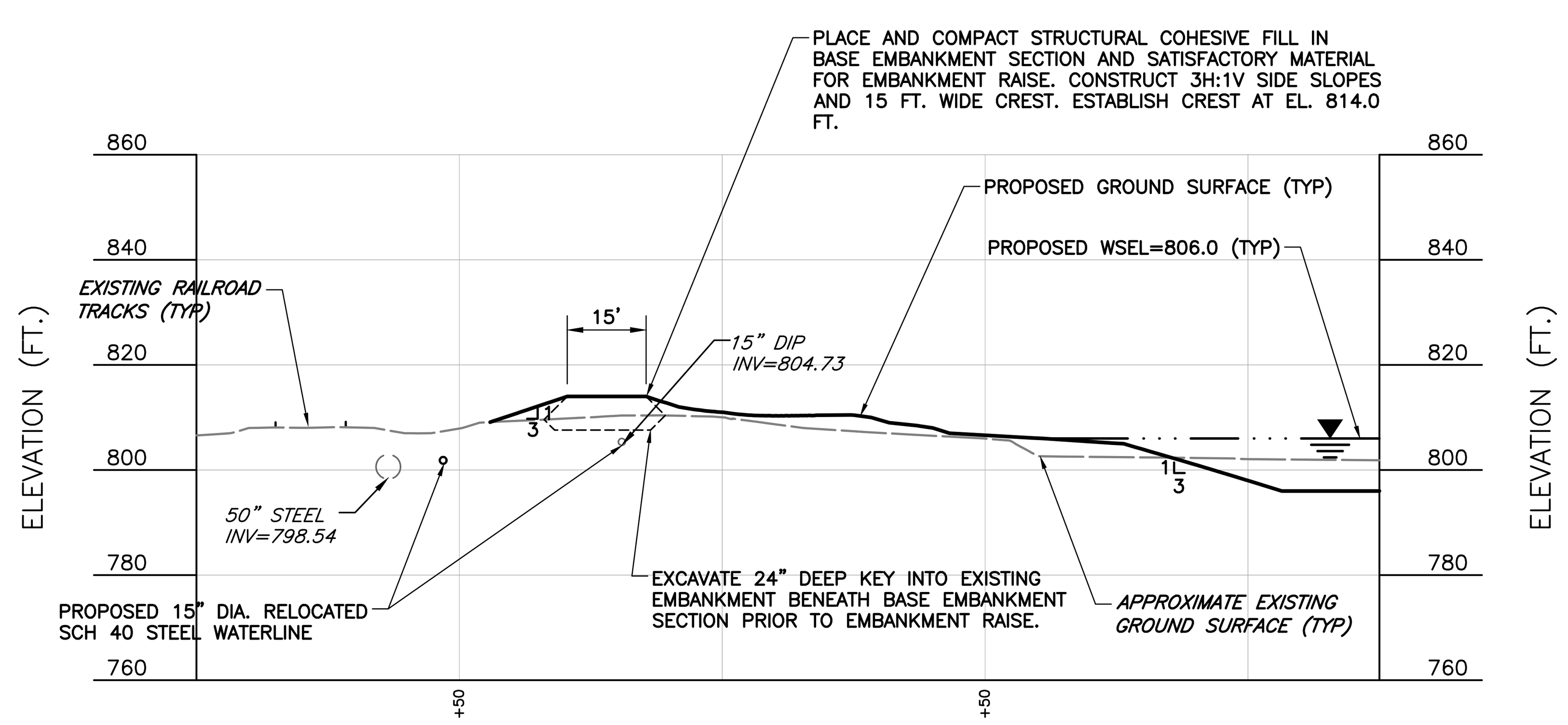

LAKE EMBANKMENT - SECTION F

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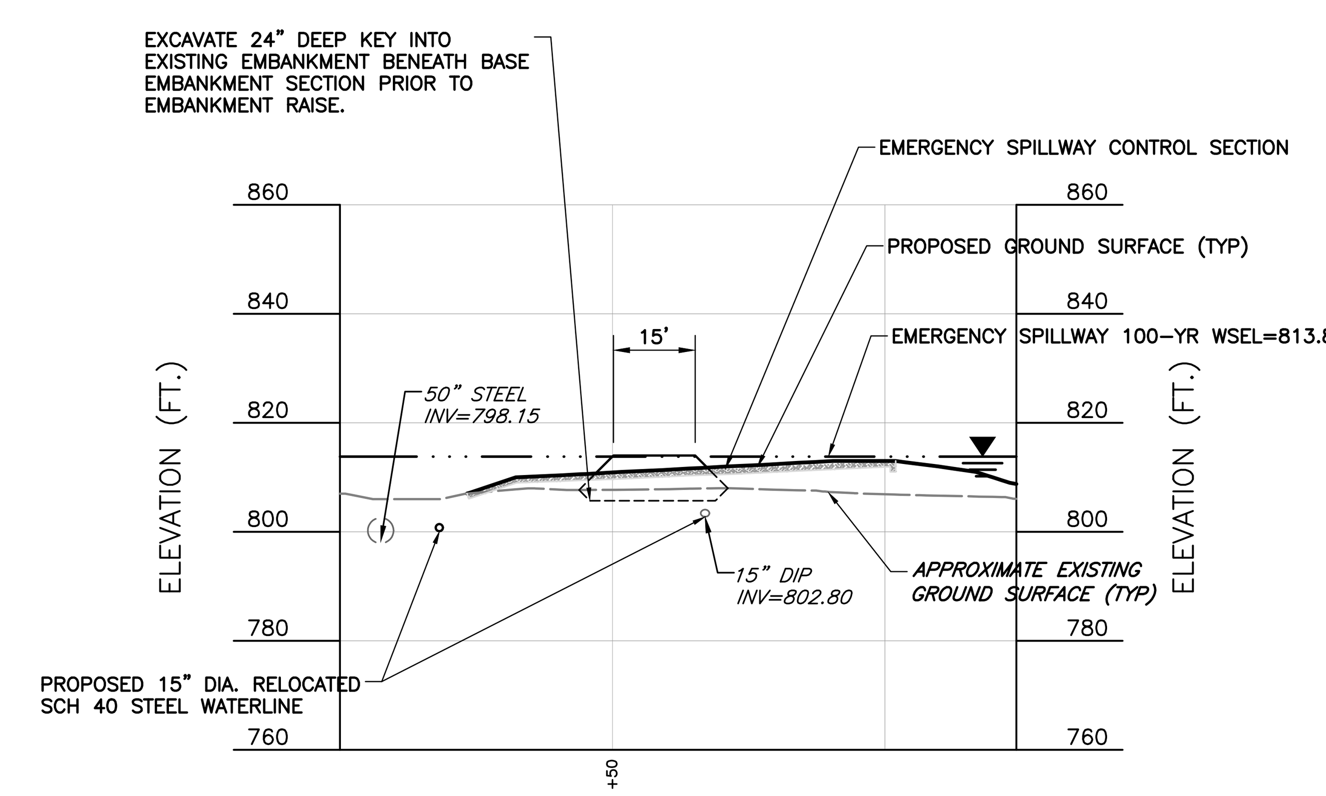

LAKE EMBANKMENT - SECTION G

SCALE H:1"=30'; V:1"=30'

SCALE IN FEET
0 30 60

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LAKE EMBANKMENT PROFILE AND SECTION VIEWS
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: C302

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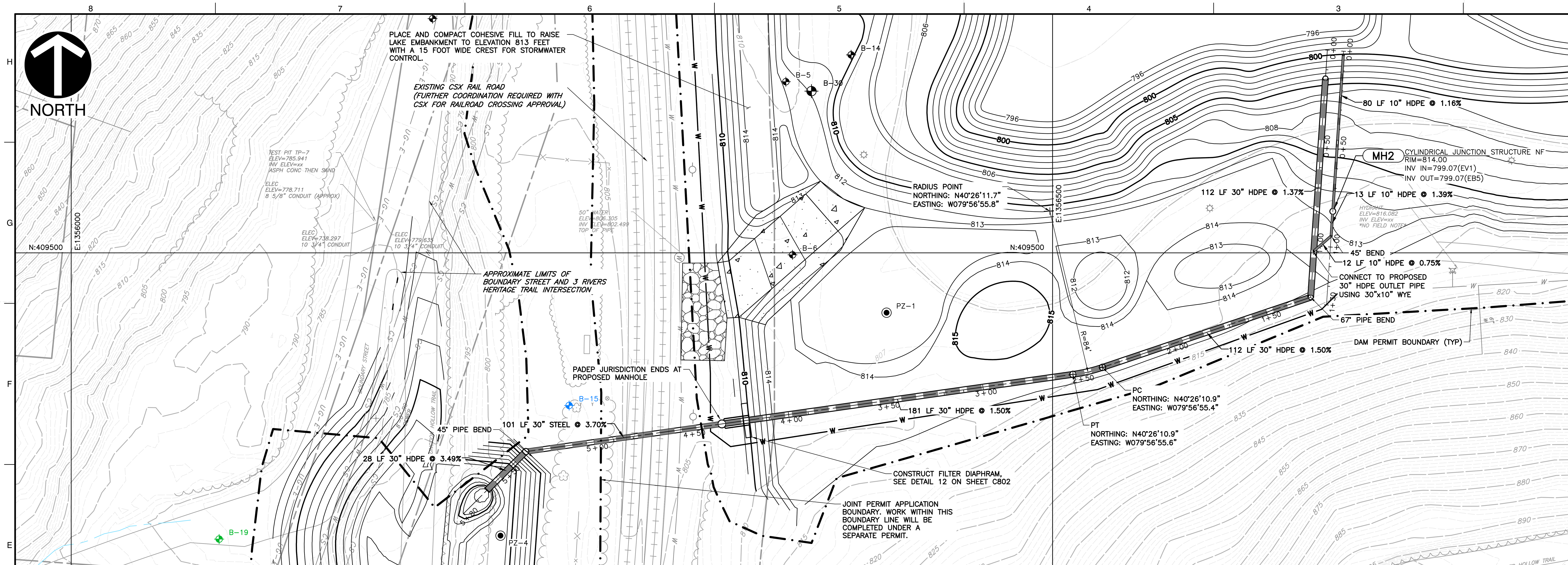
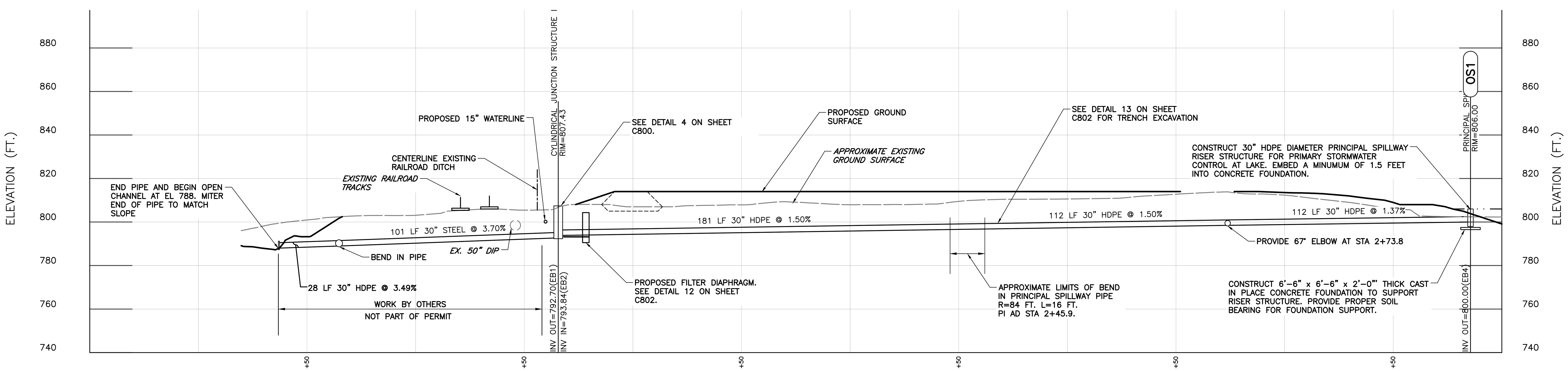


PRINCIPAL SPILLWAY PLAN

SCALE IN FEET
0 30 60



PRINCIPAL SPILLWAY PROFILE

SCALE IN FEET
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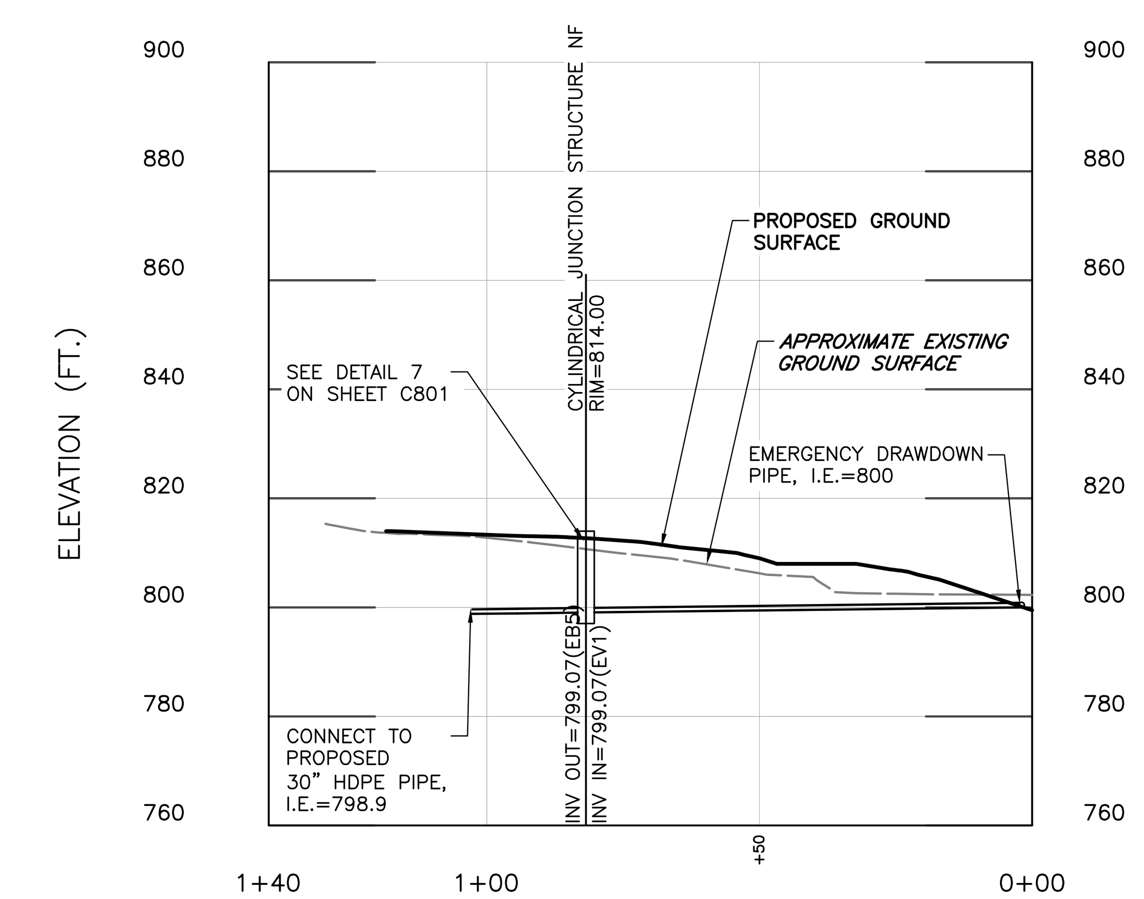

LOW LEVEL EMERGENCY PIPE PROFILE

SCALE IN FEET
0 30 60

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PANTHER HOLLOW LAKE PRINCIPAL AND EMERGENCY SPILLWAY PLAN & PROFILE VIEW

DRAWING NO.: C400

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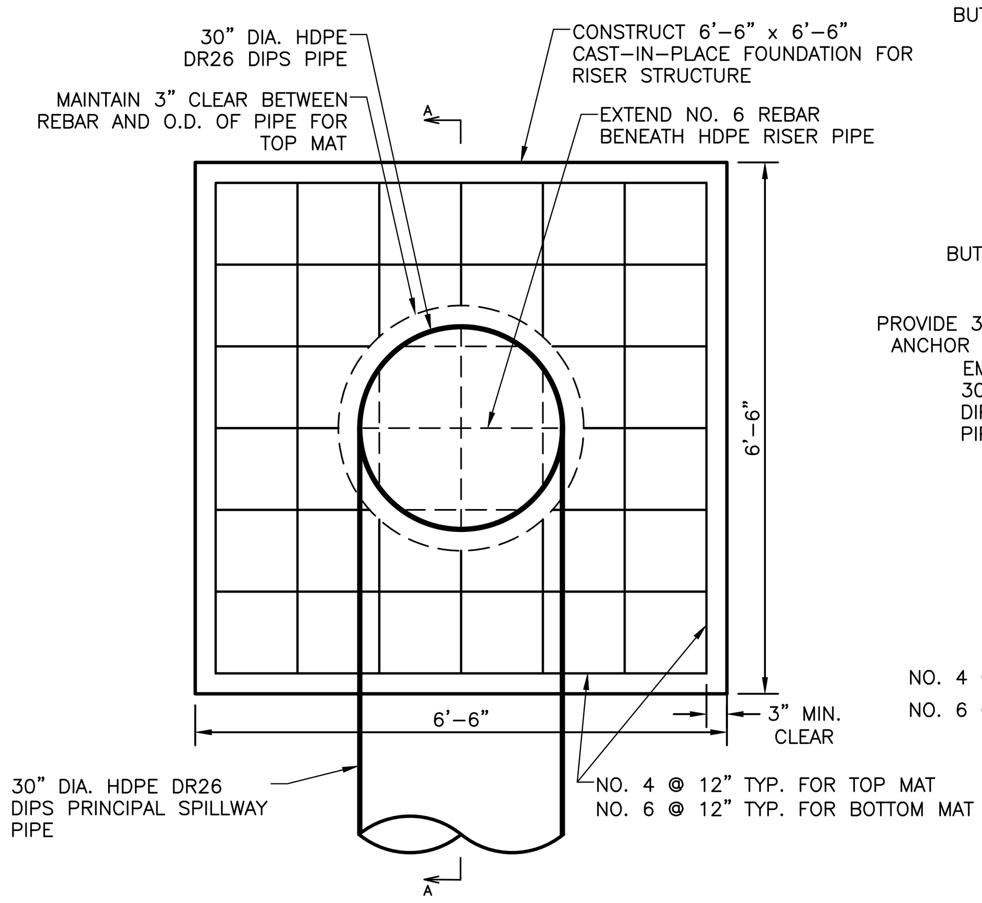
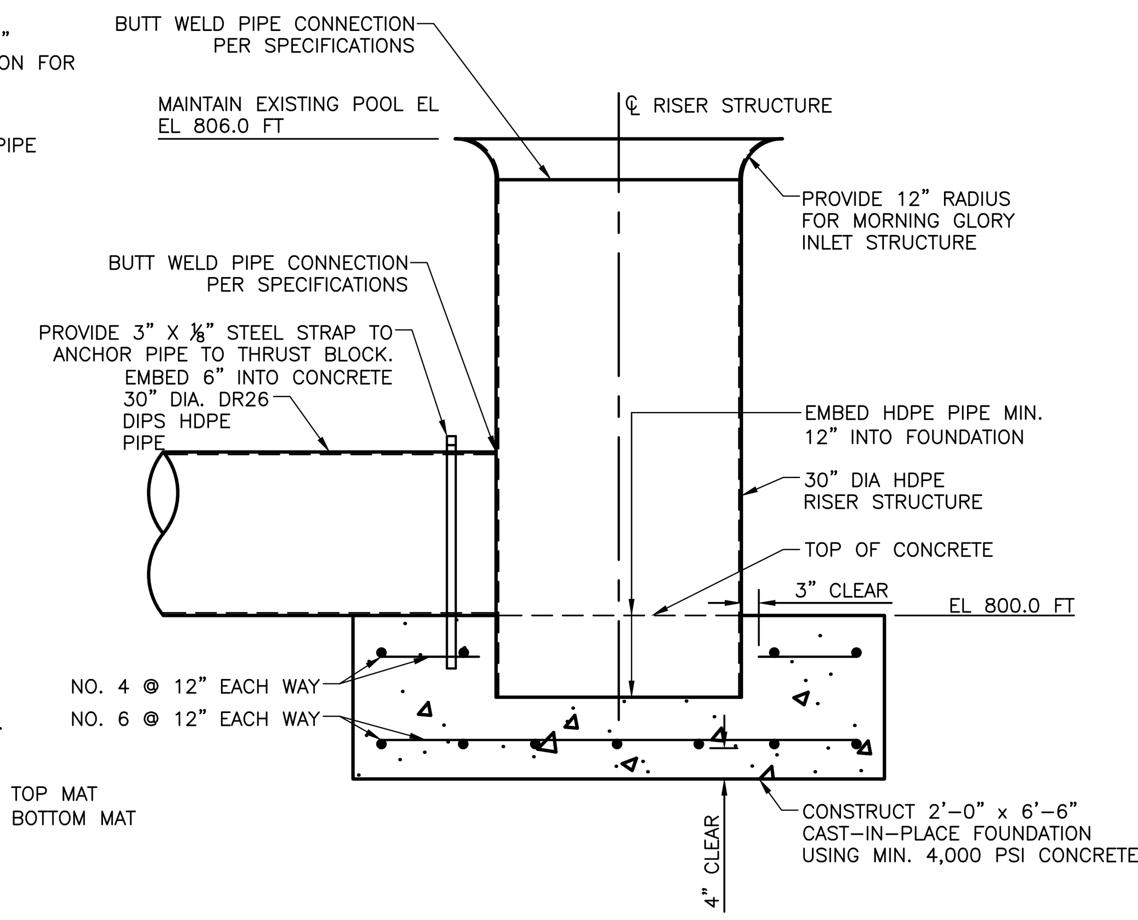
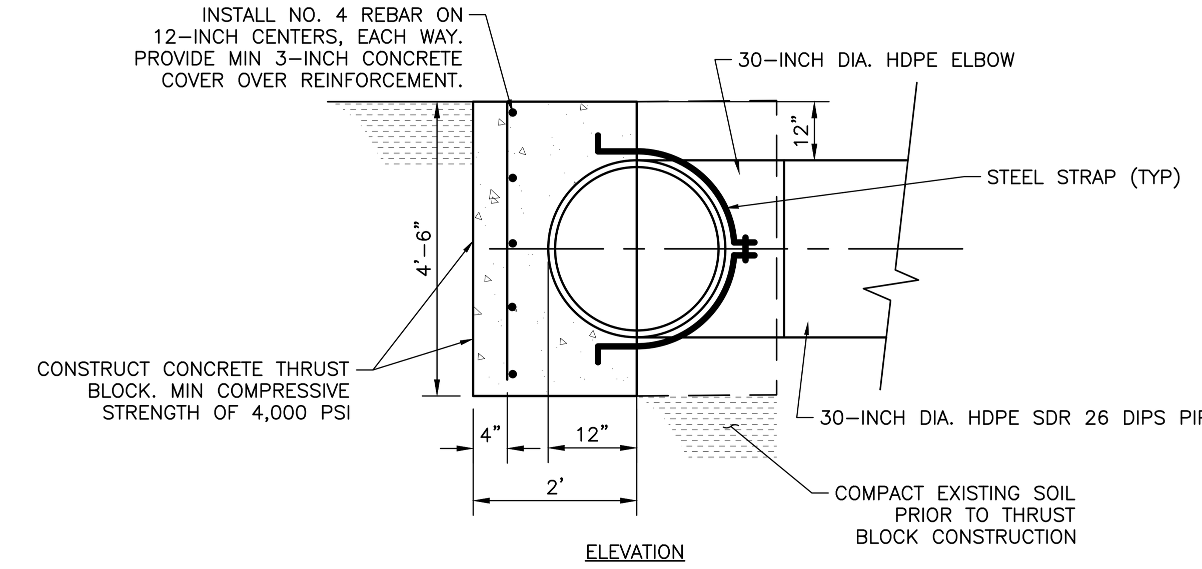
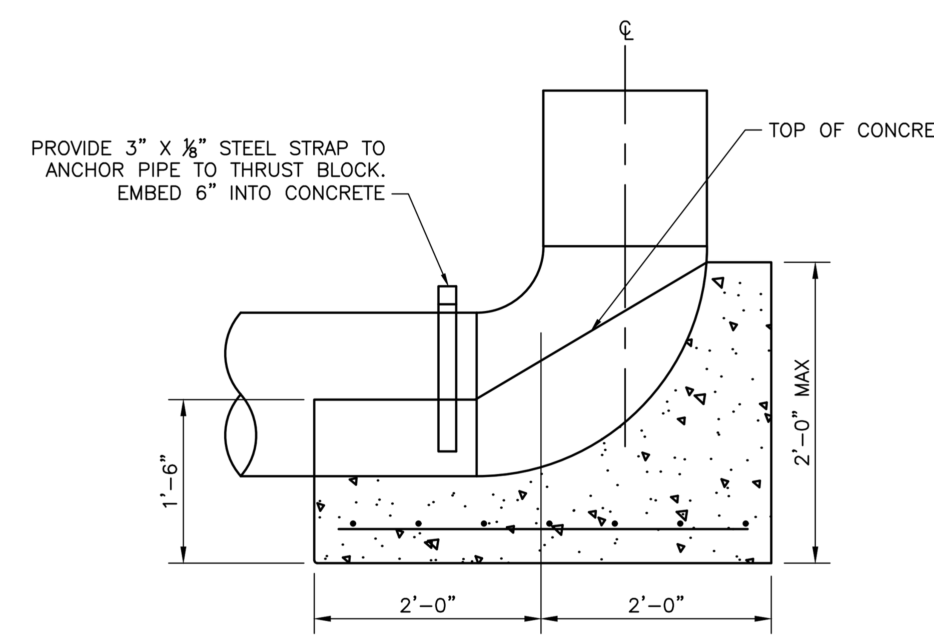


DETAIL 1
RISER STRUCTURE PLAN AND REINFORCEMENT
SCALE $\frac{3}{8}$" = 1'-0"

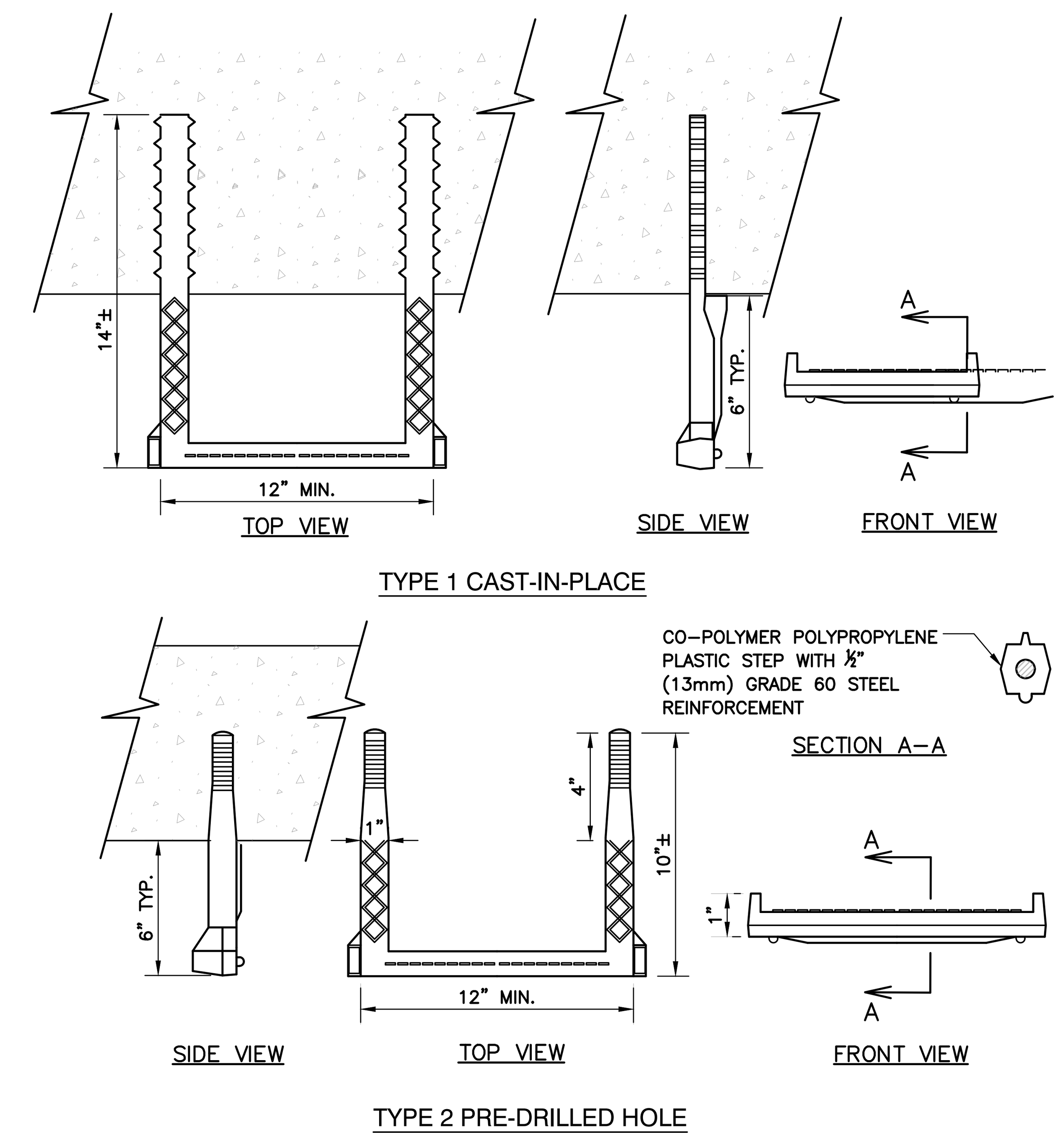


SECTION A-A
SCALE $\frac{3}{8}$" = 1'-0"





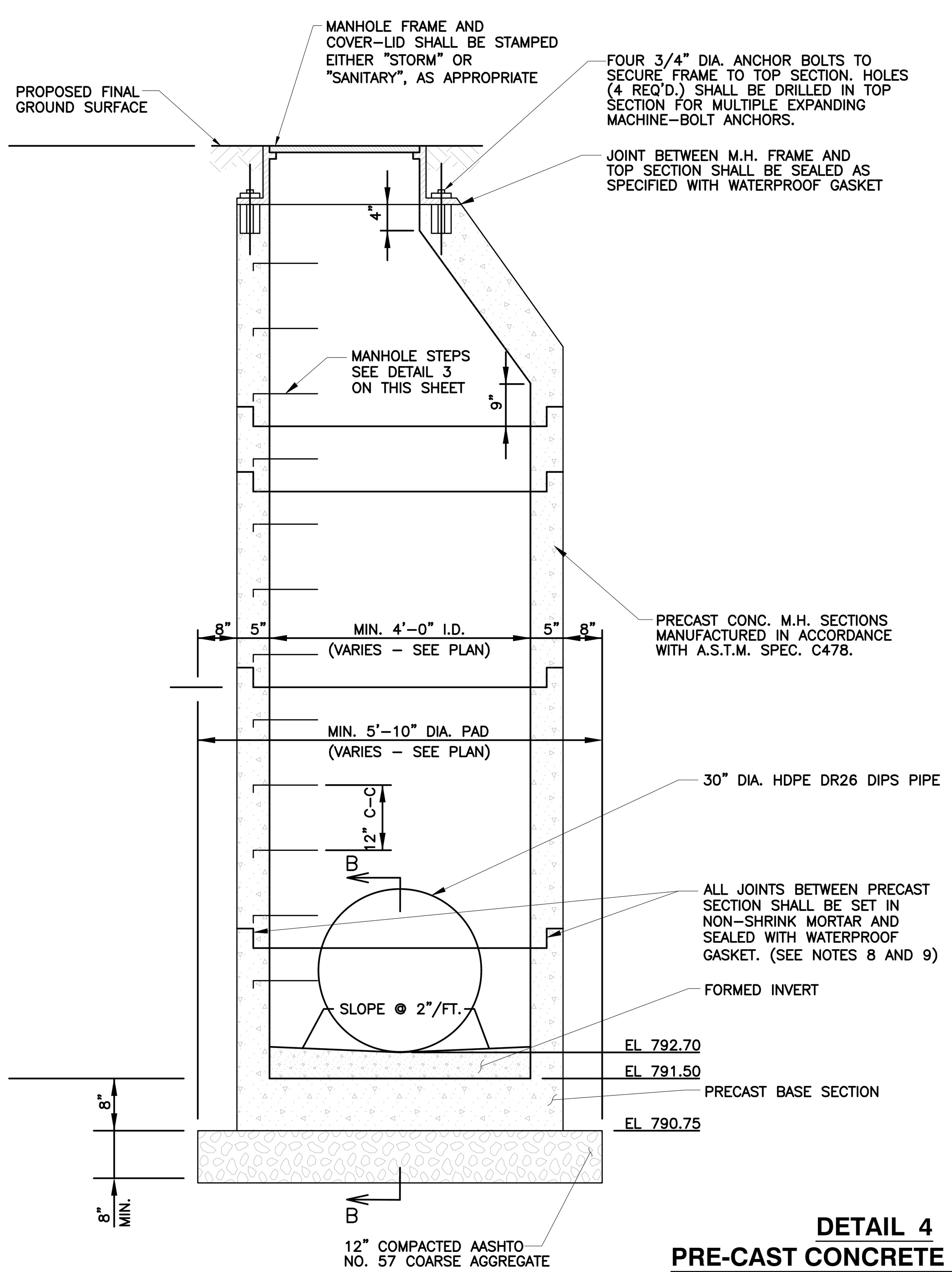
DETAIL 2
THRUST BLOCK - PLAN
N.T.S.



NOTES:

1. TYPICAL STEPS, SPACING AND MATERIAL AS PER ASTM DESIGNATION C-478, AASHTO M-199.
2. PLASTIC SHALL BE A CO-POLYMER POLYPROPYLENE MEETING THE REQUIREMENTS OUTLINED IN ASTM DESIGNATION D-4101 UNDER TYPE II, GRADE 49108.
3. STEEL REINFORCING BAR SHALL BE A ½" (13mm) DEFORMED BAR, GRADE 60 AND CONFORMING TO THE REQUIREMENTS OF ASTM DESIGNATION A-615.
4. USE TYPE 1 FOR CAST-IN-PLACE VAULTS. USE TYPE 2 FOR NEW PRECAST MANHOLES OR WHEN ADDING STEPS TO EXISTING STRUCTURES.
5. ALL STEPS SHALL BE SET VERTICALLY AT 12" CENTER TO CENTER.

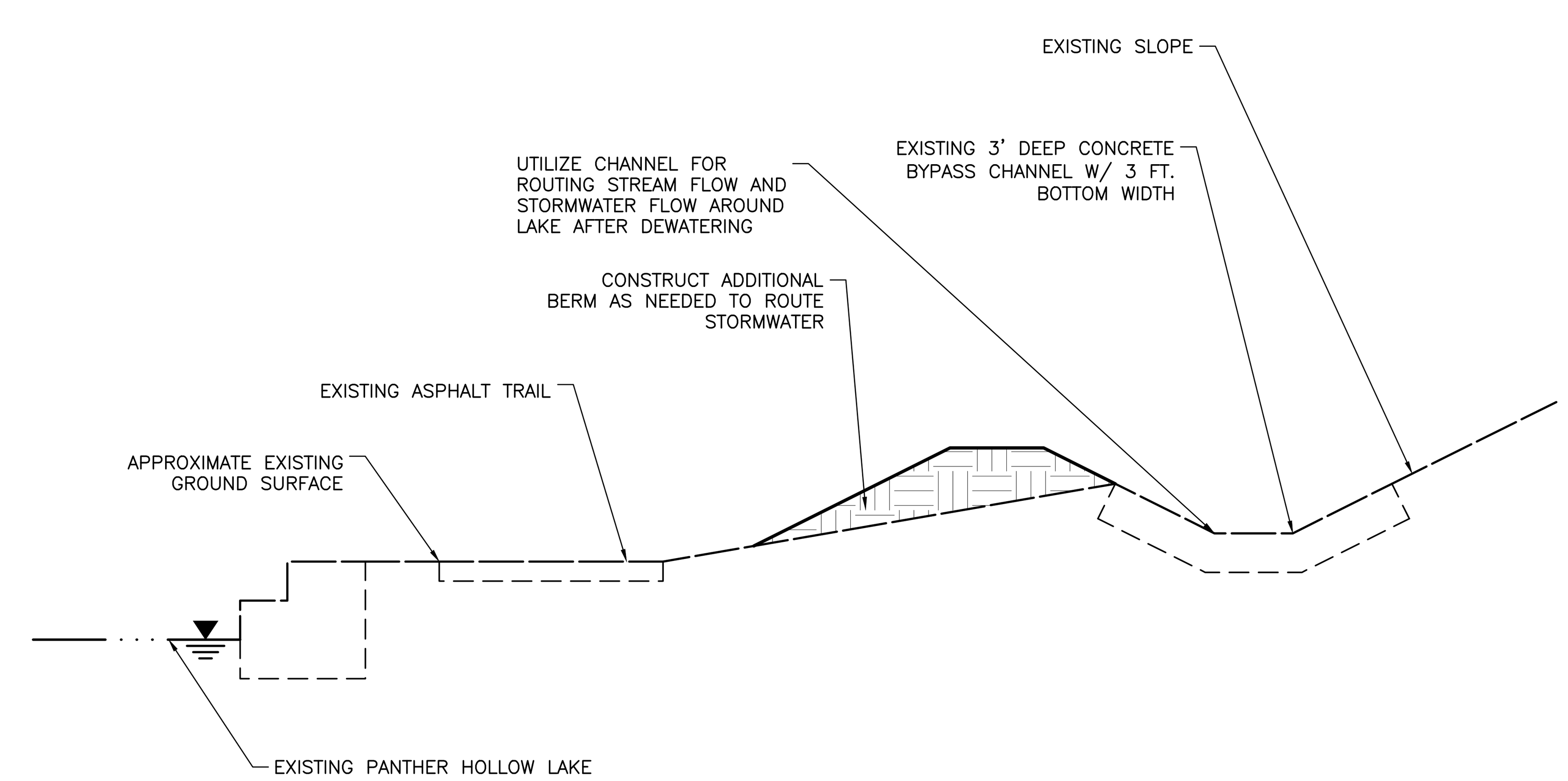
DETAIL 3
PLASTIC MANHOLE STEP
N.T.S.



NOTES:

1. CONSTRUCT IN ACCORDANCE WITH THE REQUIREMENTS OF COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PADOT) PUBLICATION 408, SECTION 605.
2. REFER TO PADOT BUREAU OF HIGHWAY DESIGN'S STANDARDS FOR ROADWAY CONSTRUCTION, SERIES RC-1 TO RC-100, SHEETS 1 THROUGH 5 OF RC-39, FOR DETAILS OF THE MANHOLE SECTIONS, GRADE ADJUSTMENT RINGS, STEPS, FRAMES AND COVERS.
3. ALL CEMENT CONCRETE USED TO CONSTRUCT THE MANHOLES SHALL BE CLASS AA, AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 704.
4. ALL REINFORCEMENT STEEL USED TO CONSTRUCT THE MANHOLES SHALL BE ASTM-A615, GRADE 60, DEFORMED OR PLAIN STEEL BARS, AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 709.1 AND 709.2 (IF APPLICABLE).
5. PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS AND GRADE ADJUSTMENT RINGS SHALL CONFORM TO THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 714, AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI.
6. ALL FRAMES AND COVERS/GRATES FOR STORM SEWER AND SANITARY SEWER MANHOLES SHALL BE NON-ROCKING AND MADE OF HEAVY DUTY CAST IRON, AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 605.2(b). ALL FRAMES SHALL BE SET IN A FULL BED OF MORTAR AND ANCHORED TO THE CONICAL TOP SECTION USING MINIMUM 4 ANCHOR BOLTS ON OPPOSITE SIDES.
7. ALL GRADE ADJUSTMENT RINGS SHALL BE OF MASONRY OR PRECAST CONCRETE CONSTRUCTION.
8. A RUBBER GASKET THAT SATISFIES THE REQUIREMENTS OF ASTM C-443 SHALL BE INSTALLED BETWEEN ALL STORM SEWER MANHOLE SECTIONS. INSTALL TWO CONTINUOUS RINGS OF BITUMINOUS MASTIC THAT SATISFY ASTM C-443 AT EACH JOINT FOR SANITARY SEWER MANHOLES.
9. ALL MANHOLE SECTIONS SHALL BE SET IN PLACE IN NON-SHRINK MORTAR OR BITUMINOUS MATERIAL AND CONFORM TO THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 705.7.
10. ALL MANHOLES SHALL HAVE LADDER RUNGS, SPACED 12 INCHES APART, TO FACILITATE ACCESS TO THE MANHOLE. ALL LADDER RUNGS SHALL BE MINIMUM NO. 4 REINFORCEMENT BARS THAT ARE COATED WITH CO-POLYMER POLYPROPYLENE PLASTIC THAT MEET THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 605.2(c). ALL LADDER RUNGS MUST MEET THE PERFORMANCE CRITERIA OF ASTM C478.
11. A MINIMUM OF 12" OF AASHTO #57 STONE SHALL BE USED AS BEDDING FOR THE MANHOLES. THE AASHTO #57 STONE SHALL BE PLACED IN MAXIMUM 6-INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 75% OF ITS RELATIVE DENSITY. ALL AASHTO #57 STONE SHALL BE CRUSHED LIMESTONE AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 703. ALL SOIL BACKFILL PLACED AROUND THE MANHOLES, AND ABOVE THE BEDDING, SHALL BE PLACED IN MAXIMUM 8-INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AND WITHIN ±3% OF ITS OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR).
12. A FLEXIBLE RUBBER MANHOLE SLEEVE OR BOOT SHALL BE INSTALLED IN THE PIPE OPENINGS FOR THE SANITARY SEWER MANHOLES BY THE MANHOLE MANUFACTURER PRIOR TO SITE DELIVERY. THE SANITARY SEWER PIPE SHALL BE SECURED TO THE SLEEVE/BOOT USING STAINLESS STRAPPING UPON INSTALLATION. ANNULAR AREA BETWEEN PIPE OPENING AND CONCRETE BASE SHALL BE RAMMED WITH EMBECO GROUT.

DETAIL 4
PRE-CAST CONCRETE MANHOLE
N.T.S.



DETAIL 5
DEWATERING BYPASS CHANNEL
N.T.S.

REVISION RECORD		
NO	DATE	DESCRIPTION

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PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 174-960
SITE CONSTRUCTION DETAILS		DRAWING NO.: C800

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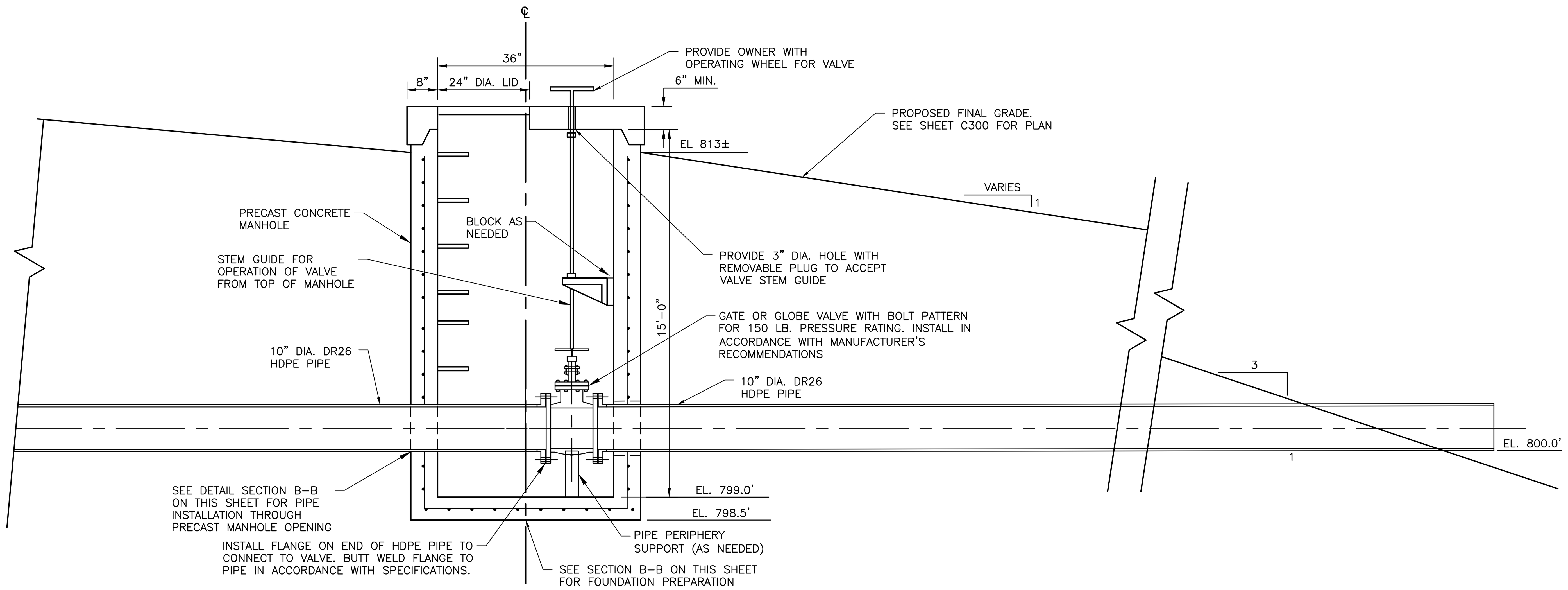
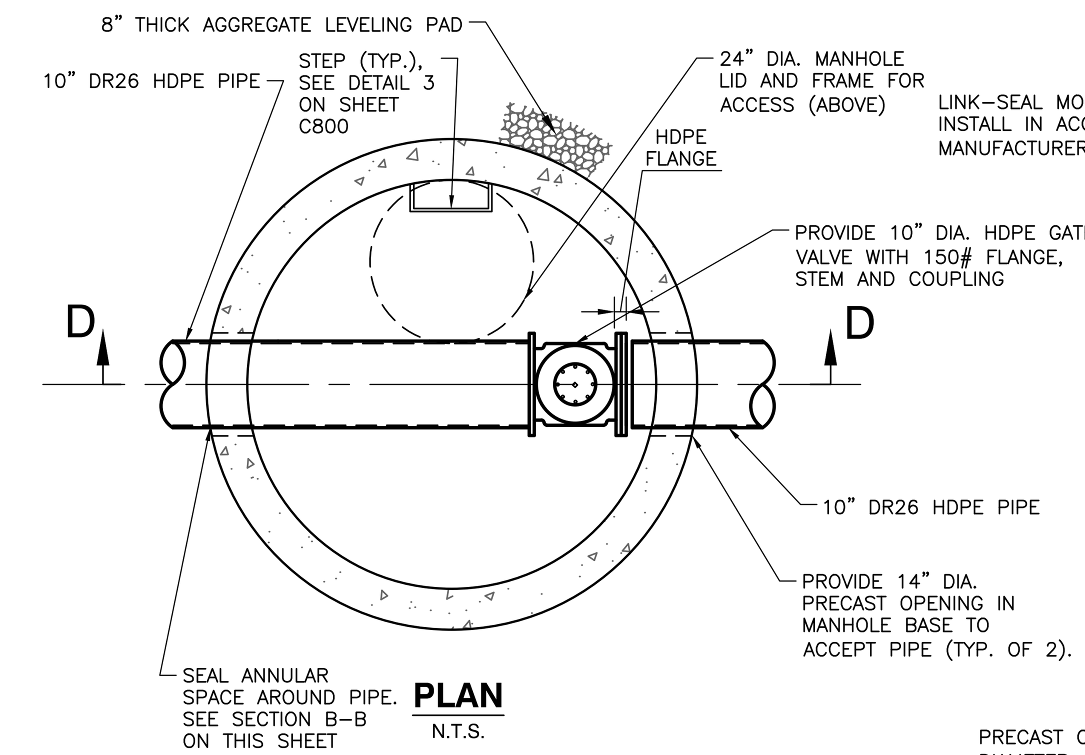


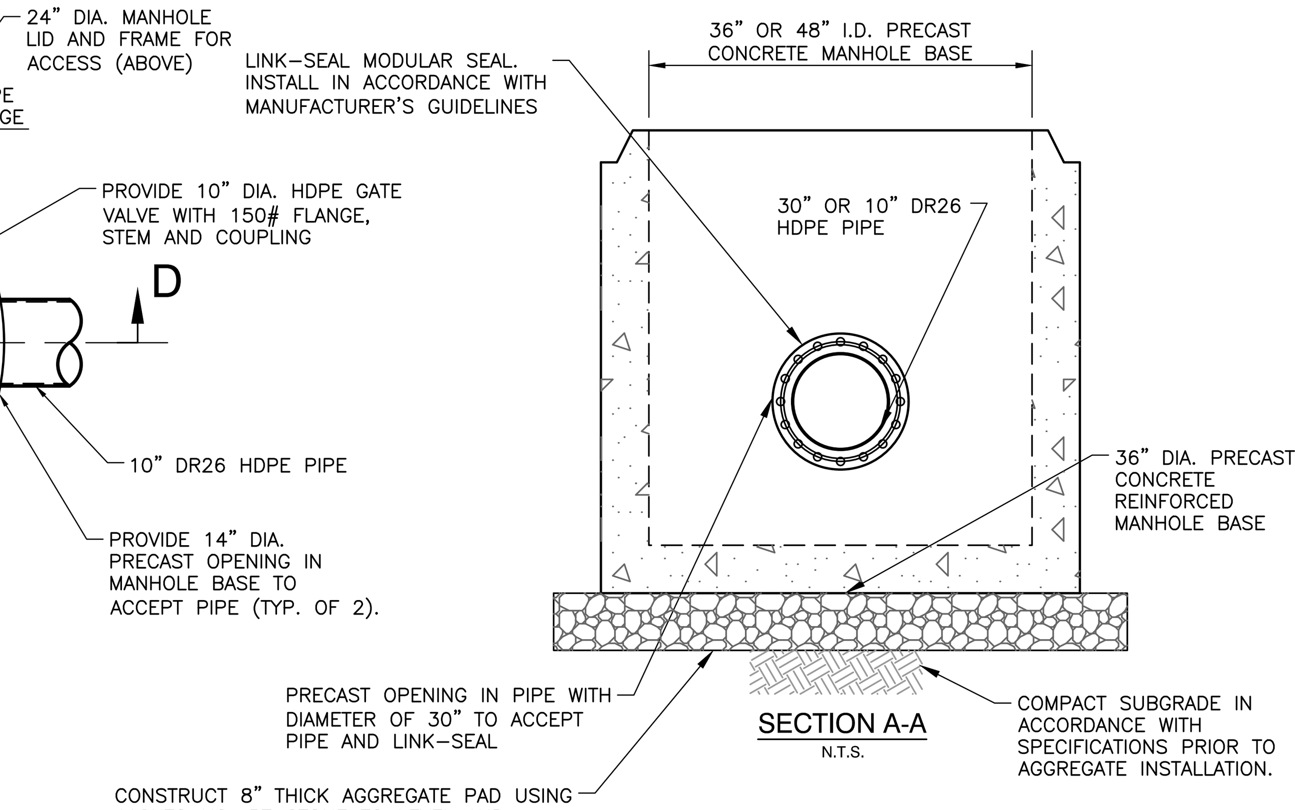
ELEVATION
N.T.S.

DETAIL 7
LOW LEVEL OUTLET
N.T.S.

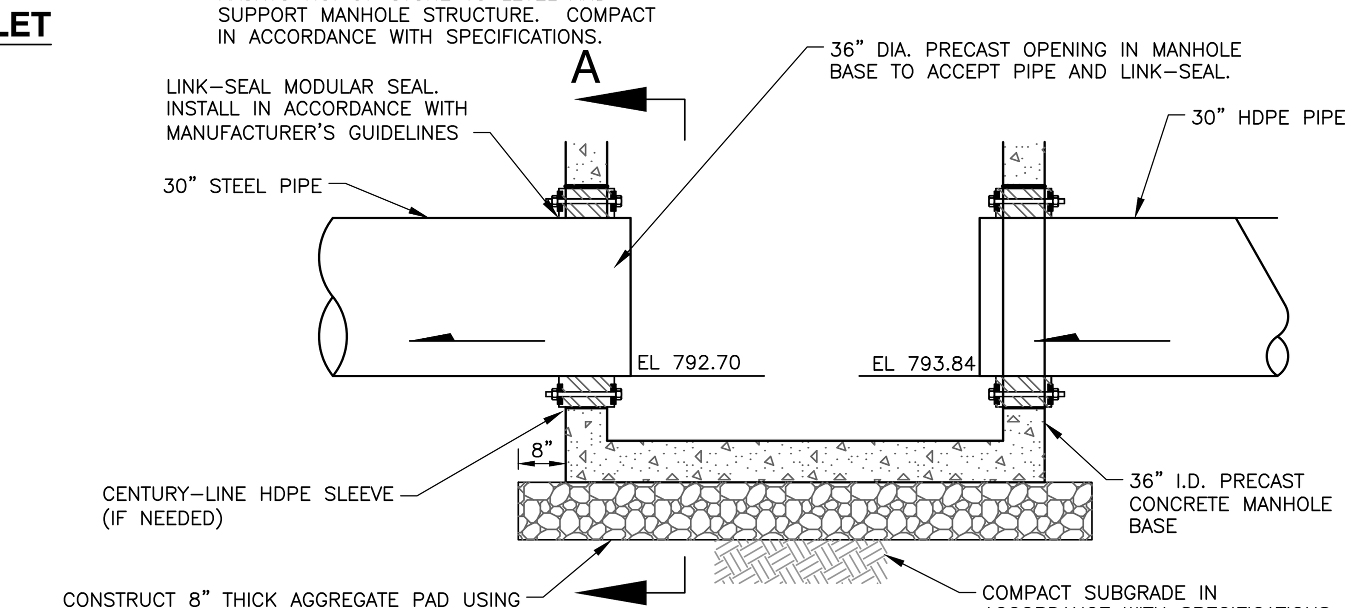


PLAN
N.T.S.

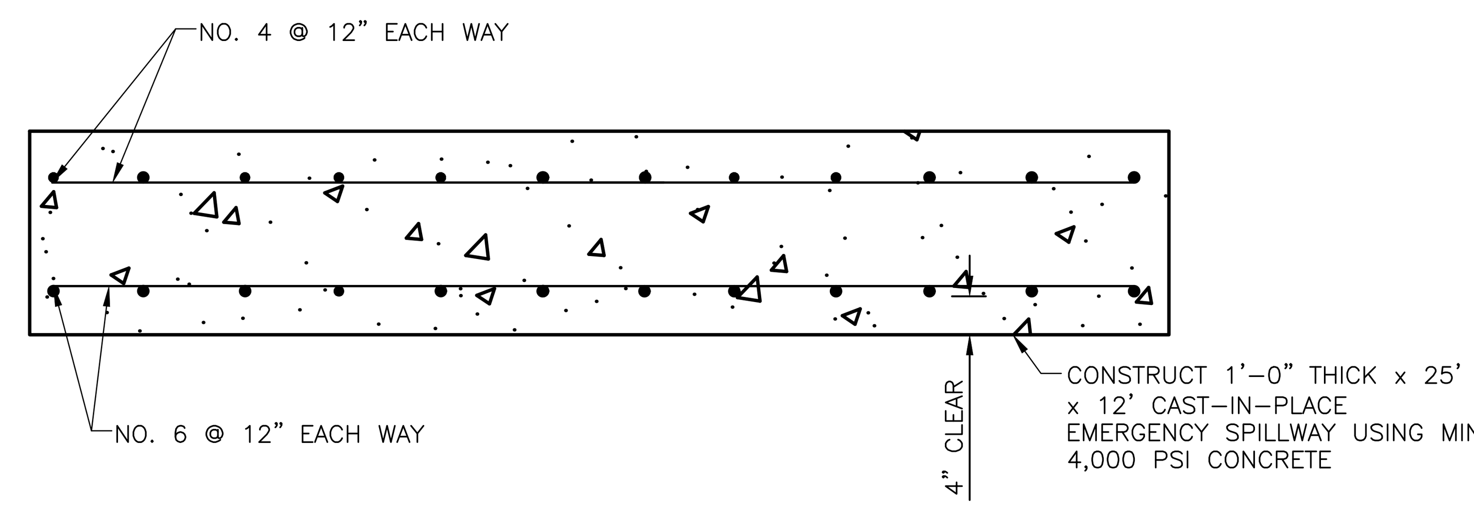
DETAIL 7
LOW LEVEL OUTLET
N.T.S.



SECTION A-A
N.T.S.

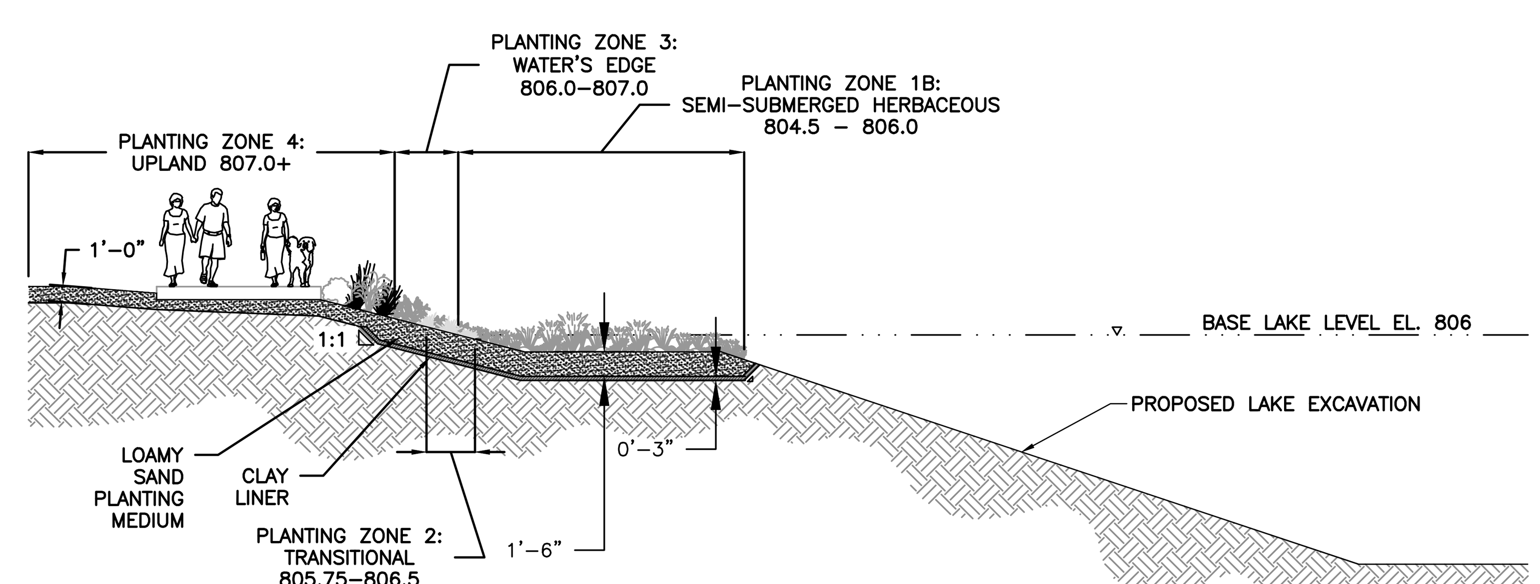


SECTION B-B
N.T.S.

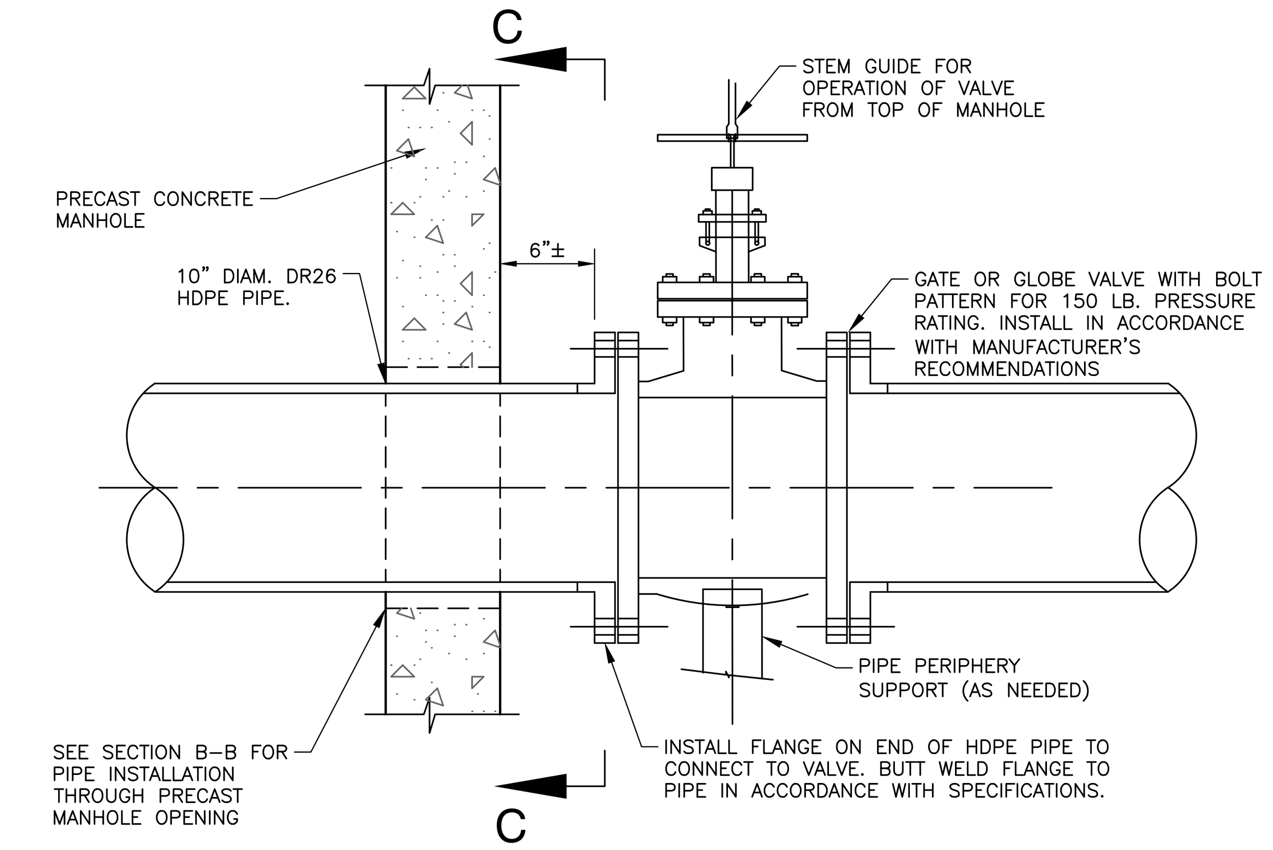


DETAIL 6
EMERGENCY SPILLWAY SECTION AND REINFORCEMENT
N.T.S.

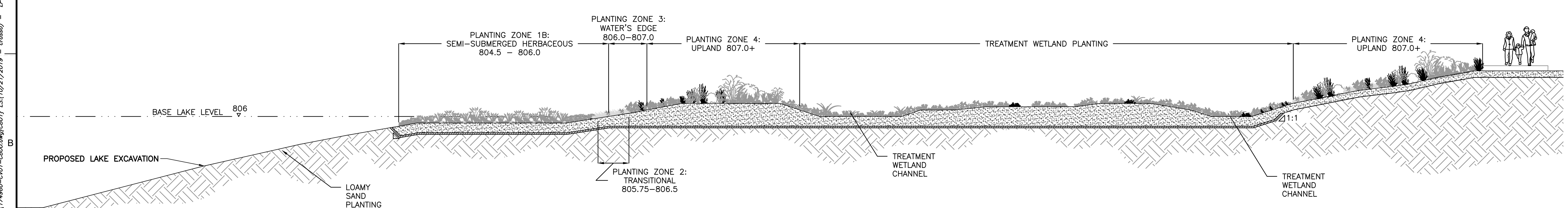
Zone 1: Semi-Submerged	Zone 2: Transitional	Zone 3: Water's Edge	Zone 4: Upland
Zone 1A **Submerged Aquatics:** Nuphar spp. Lilly species Utricularia spp. Bladderwort species **Zone 1B** **Herbaceous:** Peltandra virginica arrow arum : broad-leaf, emergent, 2'-4' tall Pontedaria cordata pickerelweed : leafy emergent, purple flower, 2'-4' tall Sagittaria latifolia duck potato : leafy emergent, white flower, 2'-4' tall Scirpus tabernaemontanii soft-stem bulrush : green, long-stemmed, emergent rush, 6'-8' tall **Shrub:** Cephalanthus occidentalis buttonbush : wetland shrub, up to 8' tall in this setting (shallow soil)	**Flowering:** Chelone glabra turtlehead : white flower, 2'-3' tall Hibiscus moscheutos swamp rose-mallow : white or pink flowers, tall plant to 6' tall Iris versicolor blueflag iris : iris with blue flowers, 2'-3' tall Mimulus ringens monkey flower : tubular blue flower, 2'-3' tall **Sedges and Rushes:** Carex comosa longhair sedge Carex crinita fringed sedge Carex lurida shallow sedge Carex stricta tussock sedge Carex vulpinoidea fox sedge Juncus canadensis Canada rush Juncus militaris bayanet rush **Barrier Plants:** Cephalanthus occidentalis buttonbush : up to 8' tall shrub Leersia oryzoides rice cutgrass : 5' tall, serrated leaves Rosa palustris swamp rose : thorny shrub, 6' tall, pink flowers	**Flowering:** Asclepias incarnata swamp milkweed : pink showy flowers Aster novi-belgii New York aster Chelone glabra turtlehead : white flower, 2'-3' tall Eupatorium perfoliatum boneset : ivory flowers Hibiscus moscheutos swamp rose-mallow : white or pink flowers, tall plant to 6' tall Iris versicolor blueflag iris : iris with blue flowers, 2'-3' tall Lobelia cardinalis cardinal flower : bright red flowers Mimulus ringens monkey flower : tubular blue flower, 2'-3' tall Verbena hastata blue vervain : violet flowering spikes **Sedges, Rushes, and Grasses:** Elymus virginicus Virginia wild-rye : 3' tall Juncus effusus soft rush : 3' tall Scirpus cyperinus woolgrass : 5' tall Scirpus pungens common 3 square : 4' tall Barrier Plants: Cephalanthus occidentalis buttonbush : up to 8' tall shrub Clethra alnifolia sweet pepperbush : 6' tall Cornus sericea redosier dogwood : 8' tall Ilex verticillata winterberry holly : 8' tall Rhododendron viscosum swamp azalea : 6' tall Salix discolor pussy willow : can get very tall for a shrub, up to 20' tall	**Flowering:** Aster novae-angliae New England aster Eupatorium coelestinum blue mistflower Eupatorium purpureum purple Joe-pye weed Rudbeckia hirta black-eyed susan **Grasses:** Andropogen gerardii big bluestem Panicum virgatum switchgrass Schizachyrium scoparium little bluestem Sorghastrum nutans Indian grass **Barrier Plants:** Clethra alnifolia sweet pepperbush Cornus amomum silky dogwood



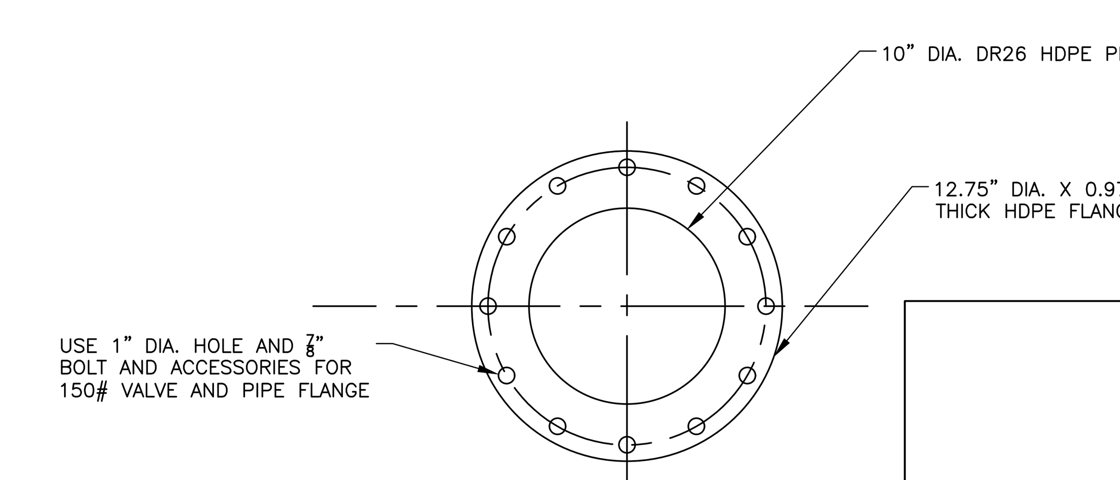
DETAIL 8
NARROW AQUATIC BENCH
SCALE 1"=10'



SECTION D-D
N.T.S.



DETAIL 9
WETLAND CROSS SECTION
SCALE 1"=10'



SECTION C-C
N.T.S.

REVISION RECORD		
NO	DATE	DESCRIPTION

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CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

SITE CONSTRUCTION DETAILS

DRAWING NO.: **C801**

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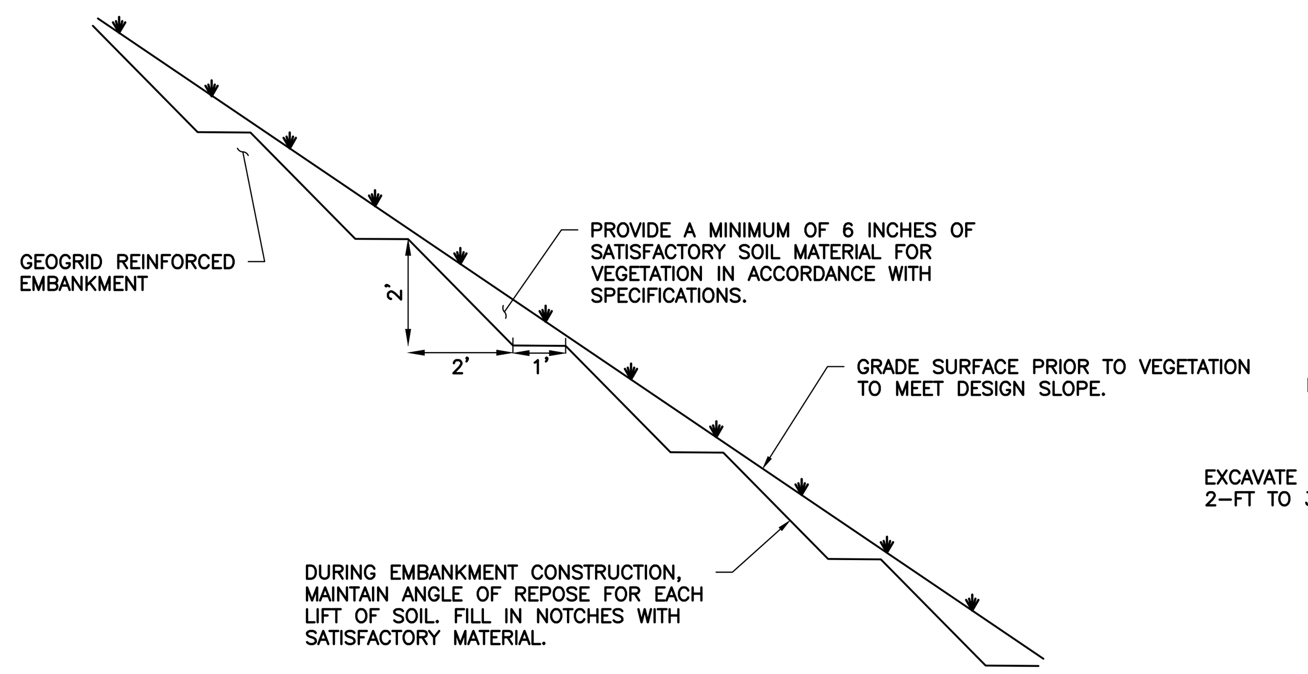
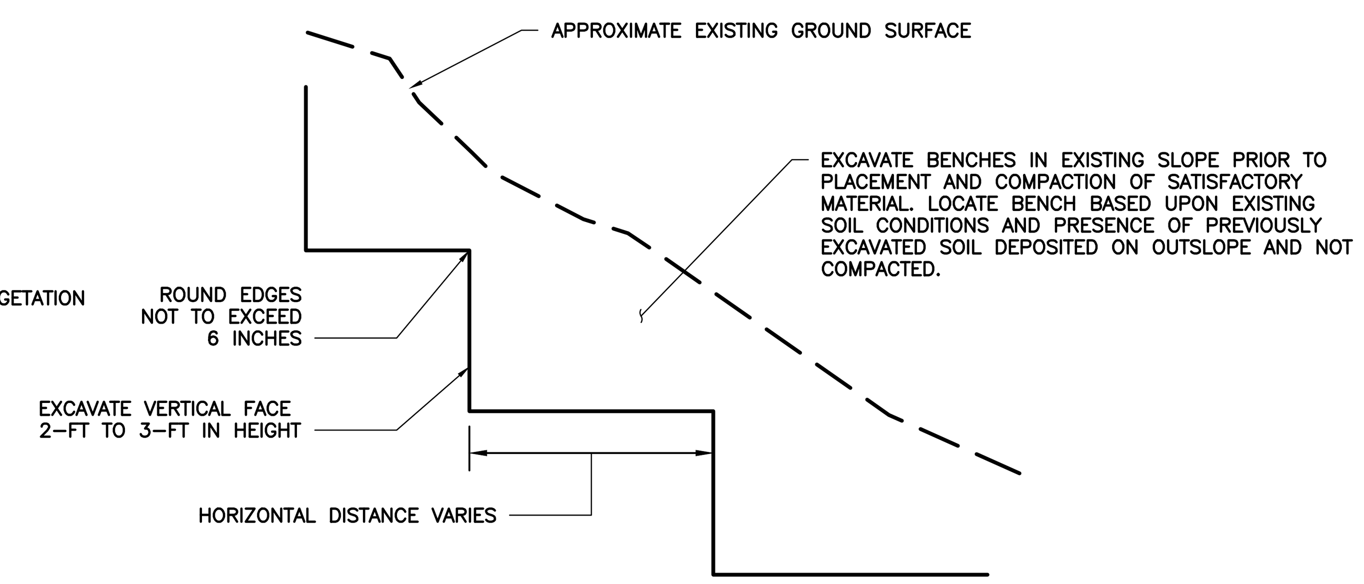
FILTER MATERIAL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
3/8 IN.	100
NO. 4	95–100
NO. 16	45–85
NO. 50	5–30
NO. 100	0–10

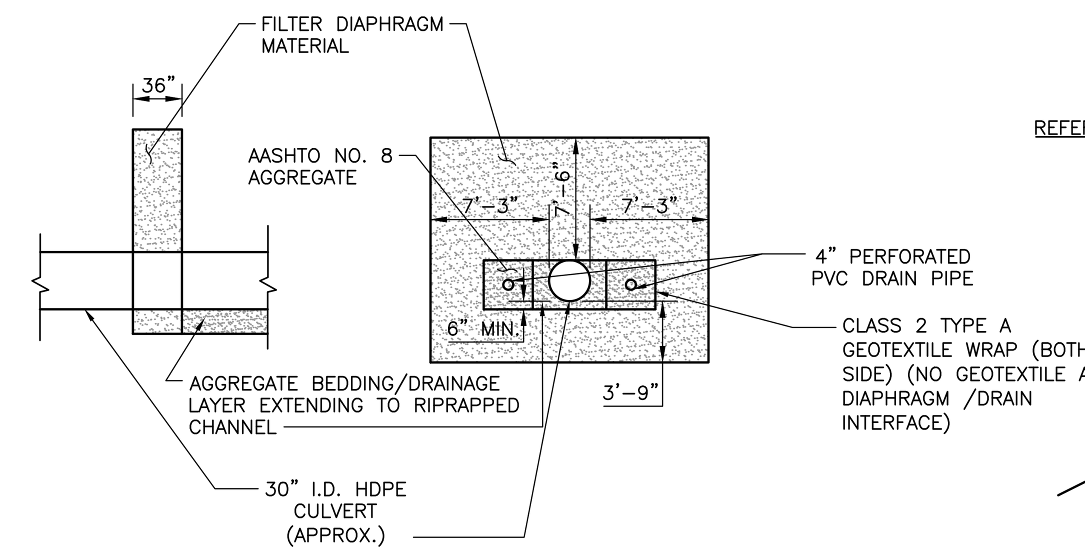
ASTM, C-33 FINE AGGREGATE



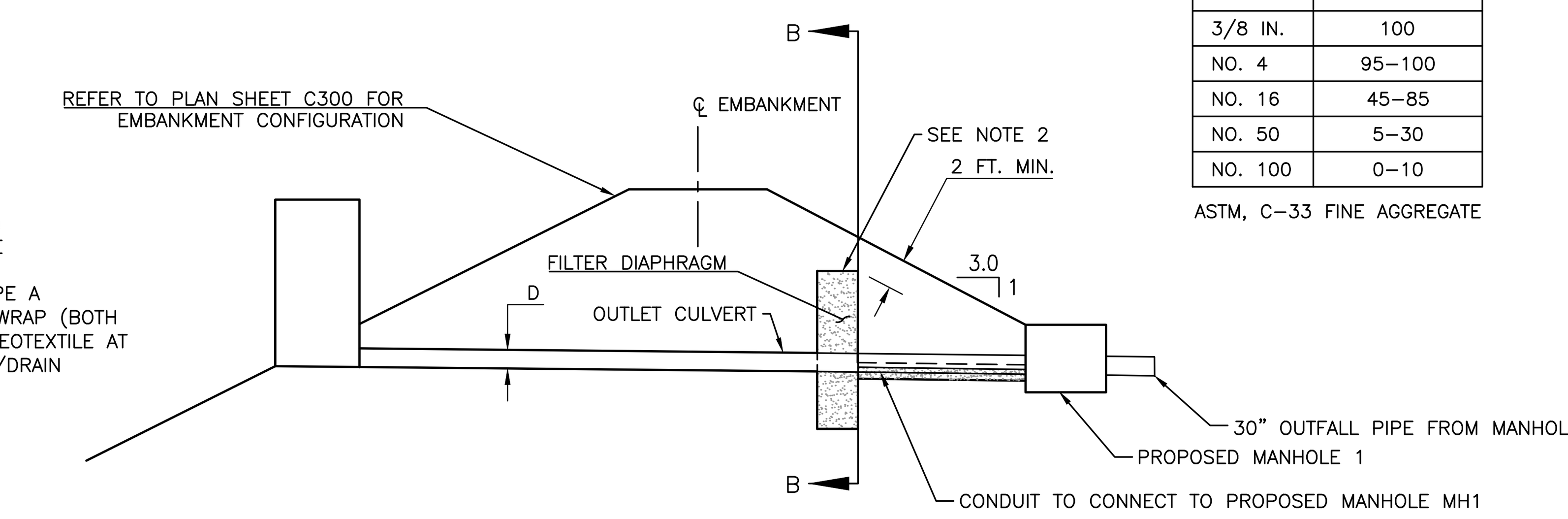
DETAIL 10
FINISHED GRADE DETAIL
N.T.S.



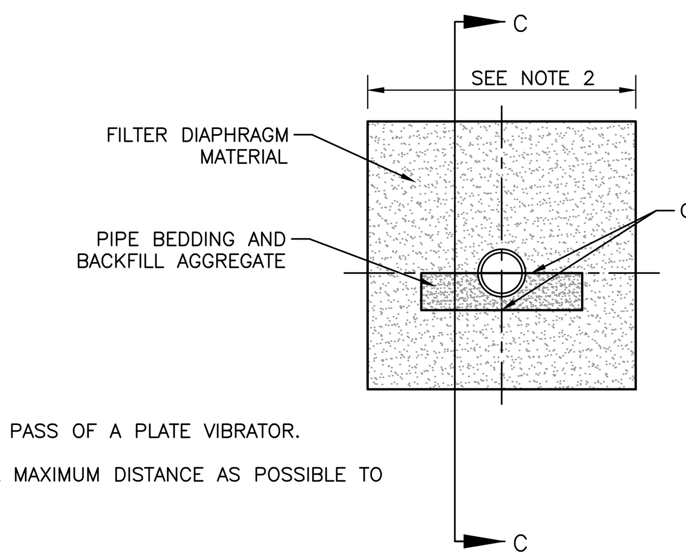
DETAIL 11
BENCHING DETAIL
N.T.S.



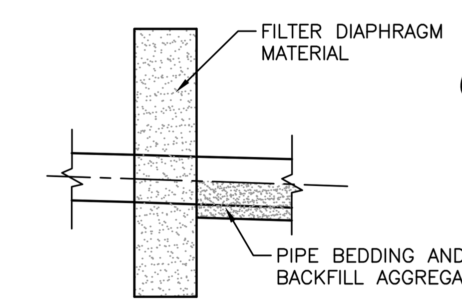
DETAIL 12
FILTER DIAPHRAGM DETAIL
N.T.S



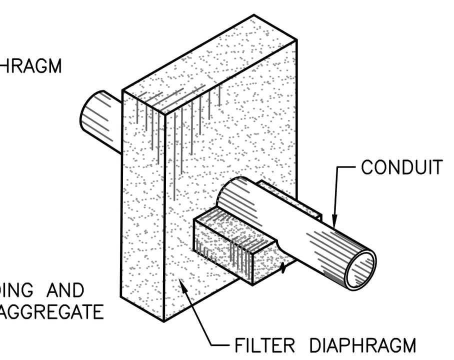
PROFILE ALONG CENTERLINE OF CONDUIT



SECTION B-B



SECTION C-C

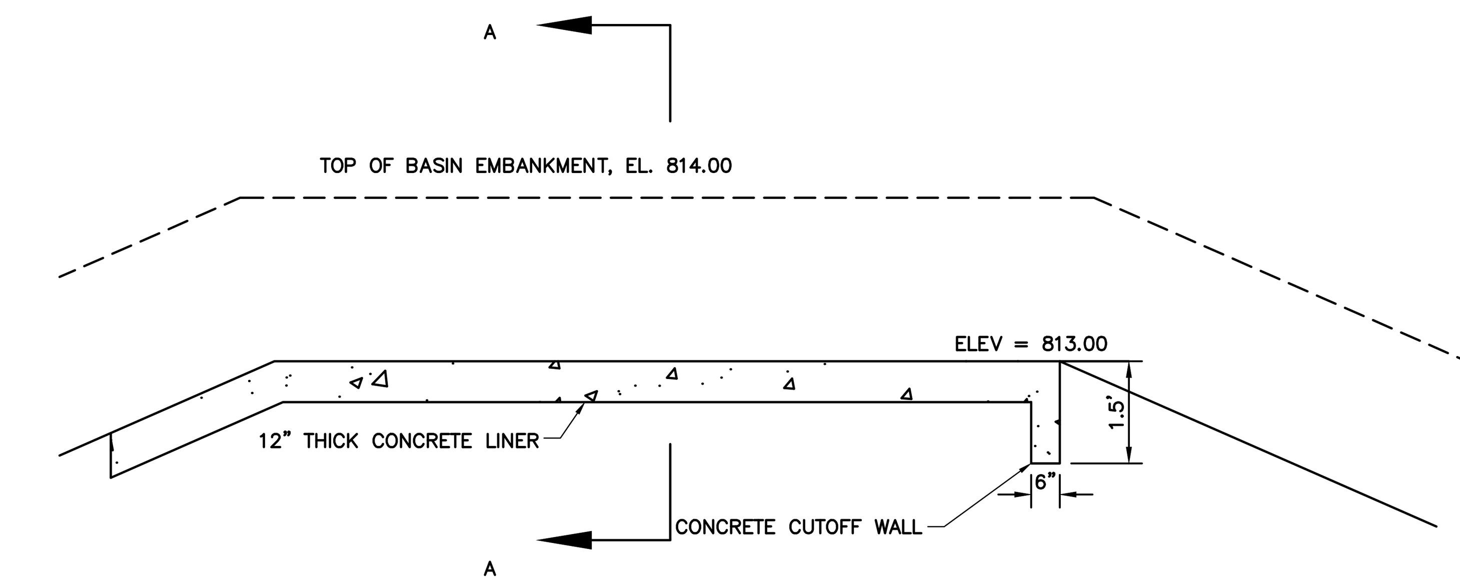


PARTIAL ISOMETRIC

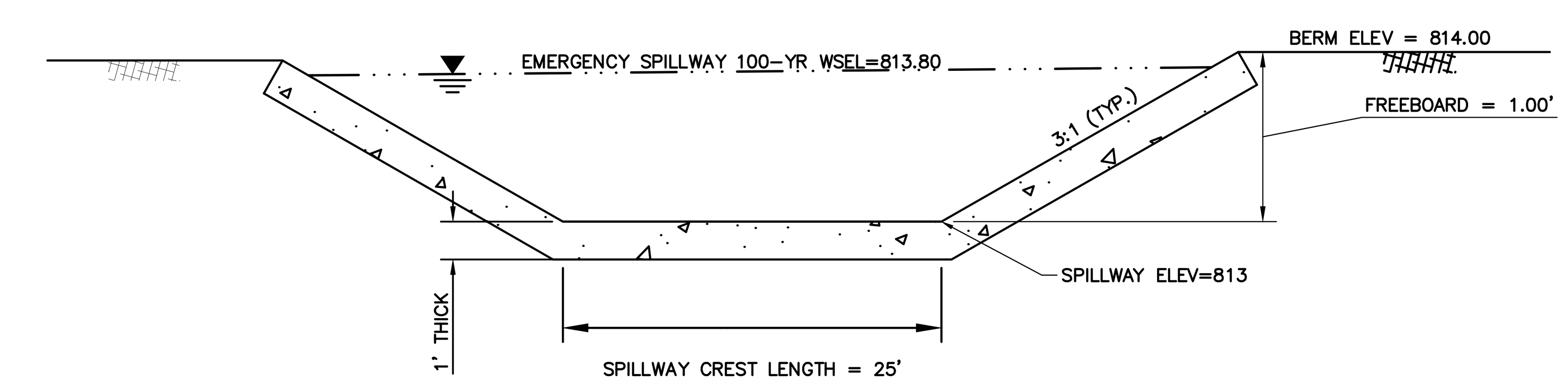
NOTES:

1. THE FILTER MATERIAL SHALL BE PLACED IN 6 INCH LIFTS AND COMPACTED WITH ONE PASS OF A PLATE VIBRATOR.
2. FILTER DIAPHRAGM SHALL BE LOCATED DOWNSTREAM FROM EMBANKMENT CENTERLINE A MAXIMUM DISTANCE AS POSSIBLE TO ACHIEVE A MINIMUM COVER OF 2 FEET.

DETAIL 14
NOT USED
N.T.S

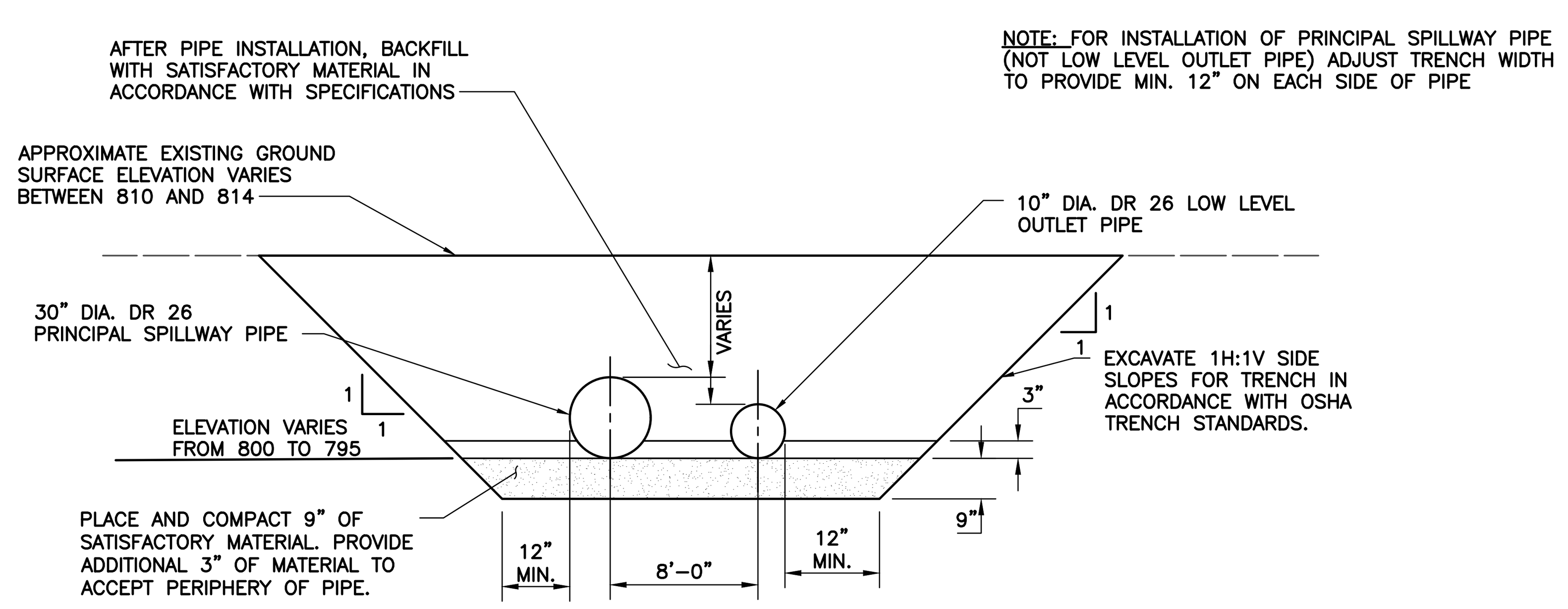


SPILLWAY



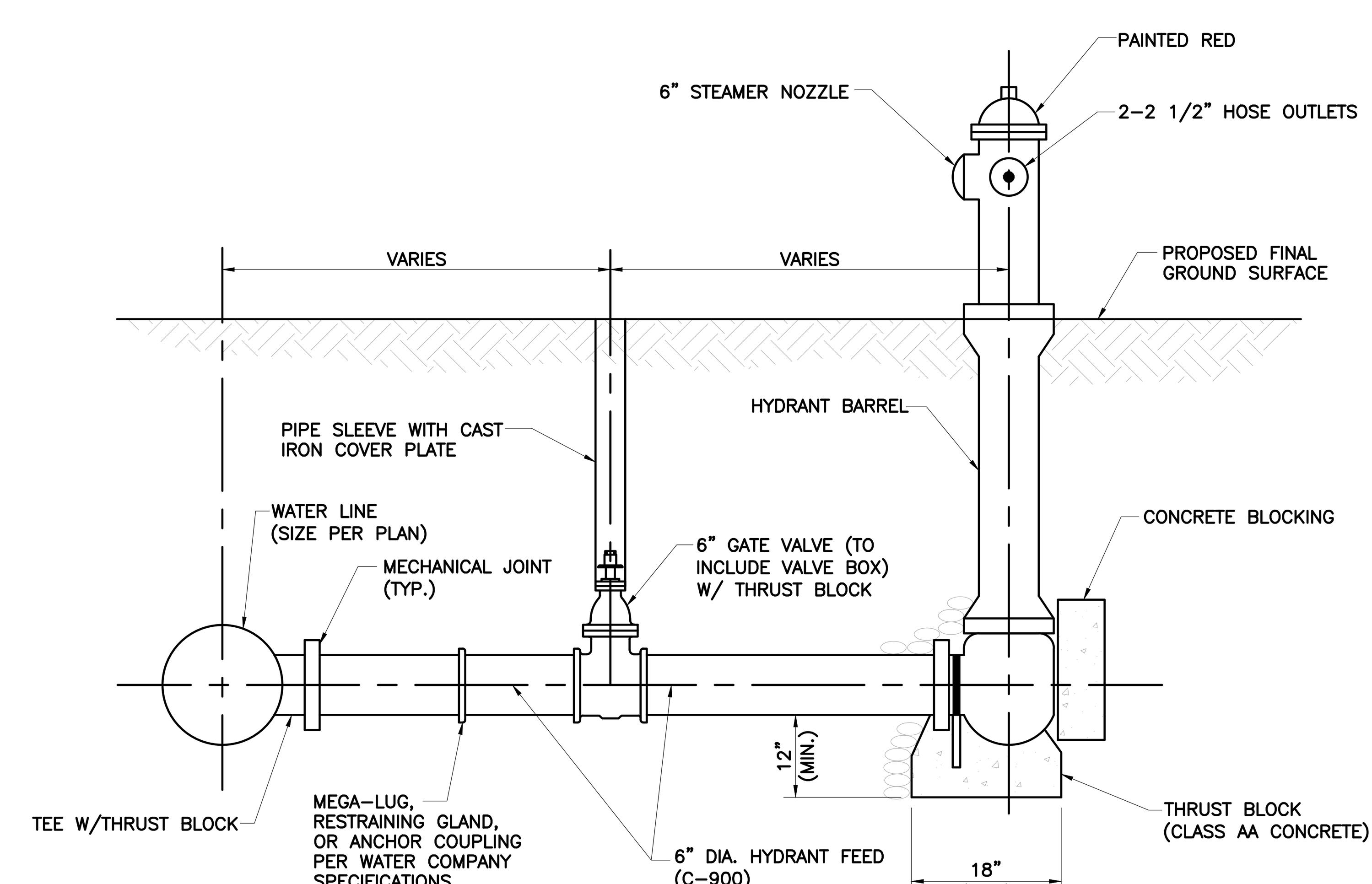
SECTION A-A

DETAIL 16
LAKE EMERGENCY SPILLWAY
N.T.S.



NOTE: FOR INSTALLATION OF PRINCIPAL SPILLWAY PIPE (NOT LOW LEVEL OUTLET PIPE) ADJUST TRENCH WIDTH TO PROVIDE MIN. 12" ON EACH SIDE OF PIPE

DETAIL 13
PRINCIPAL SPILLWAY PIPE AND LOW LEVEL OUTLET PIPE TRENCH
N.T.S



NOTES:

1. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE MUNICIPAL AUTHORITY AND PETERS TOWNSHIP FIRE DEPARTMENT REQUIREMENTS AND SPECIFICATIONS OF PA AMERICAN WATER COMPANY.
2. ALL FITTINGS, VALVES, AND HYDRANTS SHALL BE POLYETHYLENE WRAPPED.
3. FIRE HYDRANT TO MEET TOWNSHIP REQUIREMENT OF 6" FULL FLOW.

DETAIL 15
TYPICAL FIRE HYDRANT INSTALLATION
N.T.S

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REVISION RECORD

NO	DATE	DESCRIPTION

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PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

SITE CONSTRUCTION DETAILS

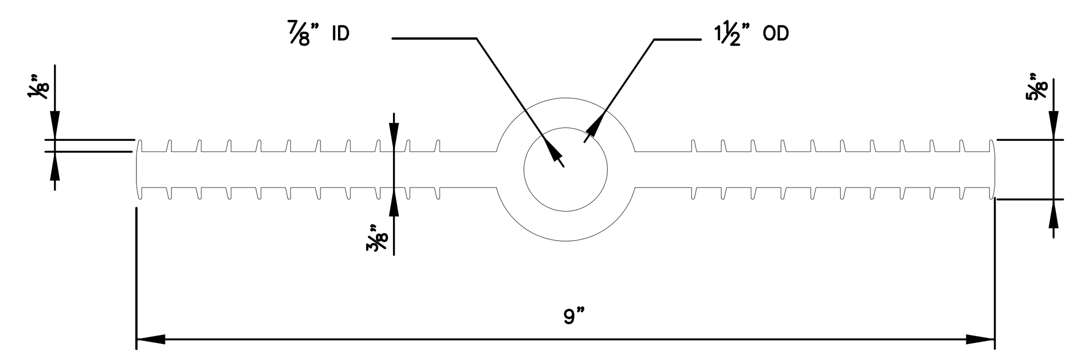
DRAWING NO.: **C802**

GENERAL NOTES

1. ALL ELEVATIONS AND COORDINATES ARE BASED VERTICAL AND HORIZONTAL DATUM INFORMATION PROVIDED ON SHEET G101.
2. ALL STATIONS AND ELEVATIONS ARE IN FEET, UNLESS NOTED OTHERWISE.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES, REGULATIONS, AND ORDINANCES DURING ALL PHASES OF CONSTRUCTION.
4. THE STRUCTURES ARE DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER CONSTRUCTION IS COMPLETED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURES IN A SAFE AND STABLE CONDITION DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY BRACING, TIE-DOWNS, PROTECTION AGAINST DAMAGE OR OTHER ITEMS THAT MAY BE NECESSARY.

CONCRETE AND REINFORCEMENT

1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, UNLESS NOTED OTHERWISE.
2. STRUCTURAL CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE SPECIFICATIONS AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, f'c = 5,000 PSI AT 28 DAYS.
3. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWINGS.
4. FORMED AND UNFORMED CONCRETE SURFACE FINISHES SHALL BE AS NOTED IN THE SPECIFICATIONS.
5. PREPARE CONCRETE SURFACES AGAINST WHICH ADDITIONAL CONCRETE IS TO BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS. HORIZONTAL CONSTRUCTION JOINTS SHALL BE ROUGHENED TO A MINIMUM AMPLITUDE OF 1/4", EXPOSING CLEAN, SOUND AGGREGATE. SURFACE OF CONSTRUCTION JOINTS SHALL BE CLEANED AND LAITANCE REMOVED.
6. ALL EXPOSED EDGES SHALL BE FORMED WITH A 3/4 INCH CHAMFER, UNLESS OTHERWISE NOTED.
7. PROVIDE CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS, UNLESS OTHERWISE NOTED:
   A. UNFORMED CONCRETE PLACED AGAINST EARTH 4"
   B. SURFACES TO BE IN CONTACT WITH EARTH OR WATER:
      - LESS THAN OR EQUAL TO 2 FT THICK 3"
      - GREATER THAN 2 FT THICK 4"
   C. SURFACES SUBJECT TO ABRASION BY FLOWING WATER 6"
   D. OTHER LOCATIONS, UNO 2"
8. PROVIDE EMBEDMENT OF CONCRETE REINFORCEMENT AND CLASS B LAP SPLICES IN ACCORDANCE WITH TABLE 1 ON THIS SHEET, UNLESS NOTED OTHERWISE.
9. WHEN BARS OF DIFFERENT SIZES ARE SPLICED, THE SPLICE LENGTH SHALL BE BASED ON THE LARGER OF THE EMBEDMENT LENGTH OF THE LARGER BAR OR THE TENSION LAP SPLICE LENGTH OF THE SMALLER BAR.
10. REINFORCEMENT SPLICES MAY BE REQUIRED THAT ARE NOT SHOWN ON THESE PLANS. SPLICE LOCATIONS AND LENGTHS SHALL BE CLEARLY SHOWN ON THE REINFORCING STEEL SHOP DRAWINGS FOR APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE.
11. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE CONSTRUCTION IS FULLY COMPLETED. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, ETC. THAT MAY BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.
12. ADDITIONAL CONSTRUCTION JOINTS (HORIZONTAL AND VERTICAL) SHALL BE SUBMITTED WITH SHOP DRAWINGS FOR APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE. ALL CONSTRUCTION JOINTS SHALL HAVE WATERSTOPS, UNLESS NOTED OTHERWISE.
13. ALL REINFORCEMENT SHALL BE DISCONTINUED AT EXPANSION JOINTS, UNLESS NOTED OTHERWISE.
14. SUBJECT TO APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE, BARS MAY BE SHIFTED SLIGHTLY TO AVOID EMBEDDED ITEMS AND OTHER OBSTRUCTIONS.
15. REINFORCING BARS: ASTM A615, GRADE 60.
16. BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW.
17. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 CURRENT EDITIONS).
18. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR SUPPORTS MUST BE CLEARLY DETAILED.
19. HOOKS AND BENDS SHALL BE ACI STANDARD UNLESS OTHERWISE INDICATED.
20. CONTINUOUS REINFORCING BARS SHALL BE PROVIDED WITH TENSION LAPS AT ALL SPLICES, UNLESS NOTED OTHER WISE NOTED. ALL STEEL REINFORCING LAPS SHALL BE TENSION B LAPS TYPICAL, UNLESS NOTED OTHERWISE.
21. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
22. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
23. REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
24. WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
25. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE.
26. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
27. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS (A325, A490) WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.

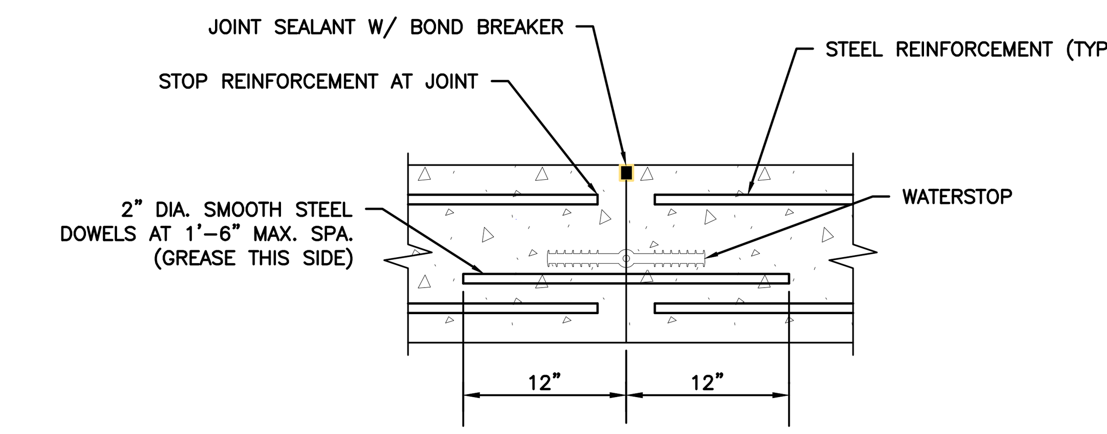


TYPICAL WATERSTOP DETAIL

N.T.S

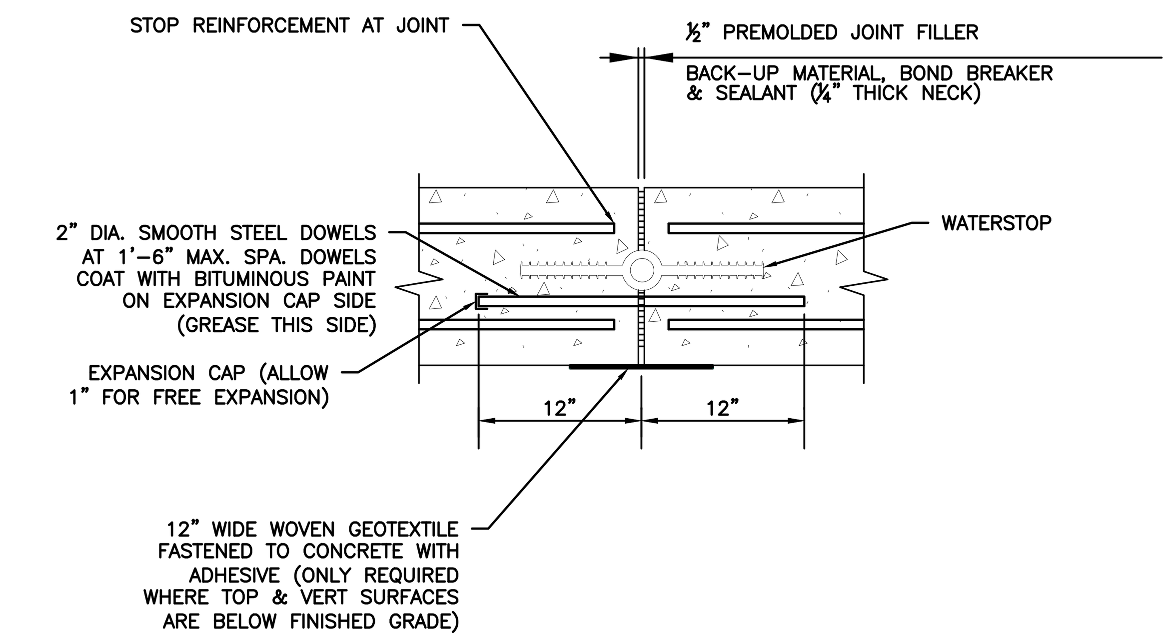
NOTES (FOR WATERSTOPS):

1. USE 9-INCH WATERSTOP AT ALL JOINTS.
2. AT LOCATIONS WHERE WATERSTOPS JOIN AT TWO DIFFERENT ANGLES OR WHERE DIFFERENT SIZE WATERSTOPS MEET OR JOIN, THE USE OF SPLIT OR WELDED SPLICE WATERSTOPS WILL BE PROHIBITED.



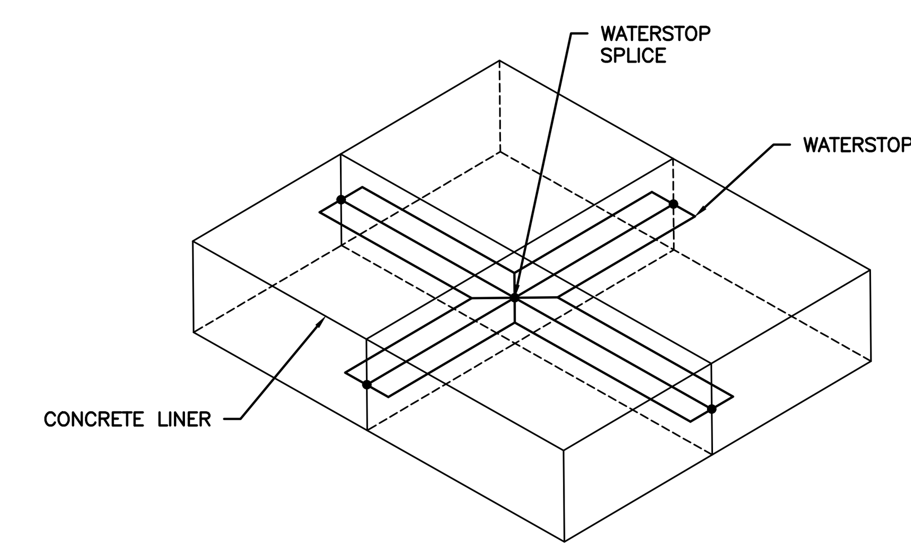
CONTRACTION JOINT DETAIL - TYPE C JOINT

N.T.S



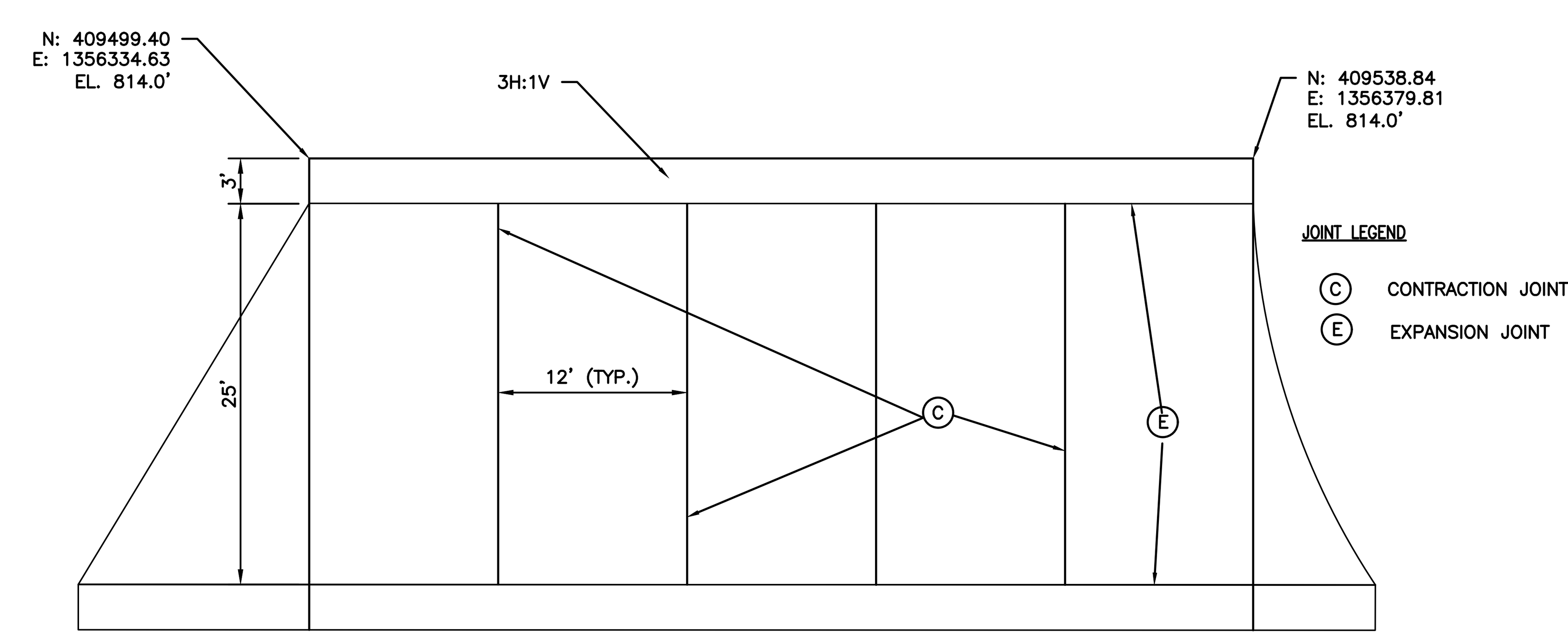
EXPANSION JOINT DETAIL - TYPE E JOINT

N.T.S



ISOMETRIC WATERSTOP DETAIL

N.T.S



EMERGENCY SPILLWAY PLAN

N.T.S

TABLE 1

BAR EMBEDMENT LENGTH AND LAP SPLICE LENGTH

f'c=4,500psi fy=60,000psi				
BAR SIZE	EMBEDMENT LENGTH		SPLICE LENGTH – CLASS B	
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	1'-0"	1'-0"	1'-2"	1'-0"
#4	1'-2"	1'-0"	1'-7"	1'-2"
#5	1'-6"	1'-2"	1'-11"	1'-6"
#6	1'-9"	1'-5"	2'-4"	1'-9"
#7	2'-7"	2'-0"	3'-4"	2'-7"
#8	2'-11"	2'-3"	3'-10"	2'-11"

NOTES FOR TABLE 1:

1. TOP BARS ARE DEFINED AS HORIZONTAL BARS (AND BARS INCLINED LESS THAN 45 DEGREES TO THE HORIZONTAL) SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER DIRECTLY BELOW THE BARS.
2. VALUES IN TABLE 1 ARE FOR UNCOATED REINFORCEMENT.
3. FOR CLASS A SPLICES, USE THE EMBEDMENT LENGTH.

REVISION RECORD		
NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
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PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960
SITE CONSTRUCTION DETAILS		DRAWING NO.: C803

LEGEND

①	COMPOST FILTER SOCK NUMBER, REFER TO C5-301 FOR SCHEDULE		DUST COVERS		EROSION CONTROL BLANKET
—CFS—	COMPOST FILTER SOCK	IFM	INLET FILTER MAT		ROCK CONSTRUCTION ENTRANCE
	LIMIT OF DISTURBANCE		CONCRETE WASHOUT		MATERIAL AND EQUIPMENT STAGING AREA
	ROCK CONSTRUCTION ENTRANCE		PUMPED WATER FILTER BAG		SOIL STOCKPILE AREA
	SOIL DELINEATION	GQF	SOIL TYPE		

Pennsylvania One Call System, Inc.
Call 3 Business Days Before You Dig!
1-800-242-1776 or 8-1-1
POCS Serial NO. :________________
Date:________________

CONTRACTORS ARE REQUIRED TO NOTIFY THE FACILITY OWNERS NOT LESS THAN THREE (3) NOT MORE THAN TEN (10) WORKING DAYS PRIOR TO EXCAVATION OR DEMOLITION WORK WHEN USING POWERED EQUIPMENT ON PUBLIC OR PRIVATE PROPERTY ANYWHERE IN THE COMMONWEALTH. CONTRACTORS ARE RESPONSIBLE FOR PRESERVING THE FACILITY OWNER MARKINGS, TO EXERCISE DUE CARE AND EMPLOY PRUDENT TECHNIQUES WITHIN THE TOLERANCE ZONE. CONTRACTORS SHOULD KEEP EACH OPERATOR AT THE SITE INFORMED AND EVALUATE THE PREMISES IF NECESSARY. NOTIFICATION SHOULD BE MADE THROUGH THE PENNSYLVANIA ONE-CALL SYSTEM (1-800-242-1776 or 8-1-1).

SYMBOL	SOIL TYPE
URB	URBAN LAND-RAINSBORO COMPLEX, GENTLY SLOPING, HYDROLOGIC SOIL GROUP C
UB	URBAN LAND
GQF	GILPIN-UPSHUR COMPLEX, VERY STEEP, HYDROLOGIC SOIL GROUP C

OFF-SITE RECEIVING WATERS OF THE COMMONWEALTH

UNT TO MONONGAHELA RIVER ID: 134839843 - WARM WATER FISHES (WWF)

WATERSHED: LOWER MONONGAHELA

REFERENCE: PA eMap

SOCK NO.	DIAMETER (IN.)	SLOPE (%)	SLOPE LENGTH ABOVE BARRIER (FT.)
1	18	33	12
2	18	7	93
3	18	33	12

REFERENCE: PADEP E&S MANUAL STANDARD E&S WORKSHEET NO. 1

DRAFT

40' 0' 40' 80'
SCALE: 1" = 40'

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION RECORD

NO	DATE	DESCRIPTION

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PITTSBURGH PENNSYLVANIA
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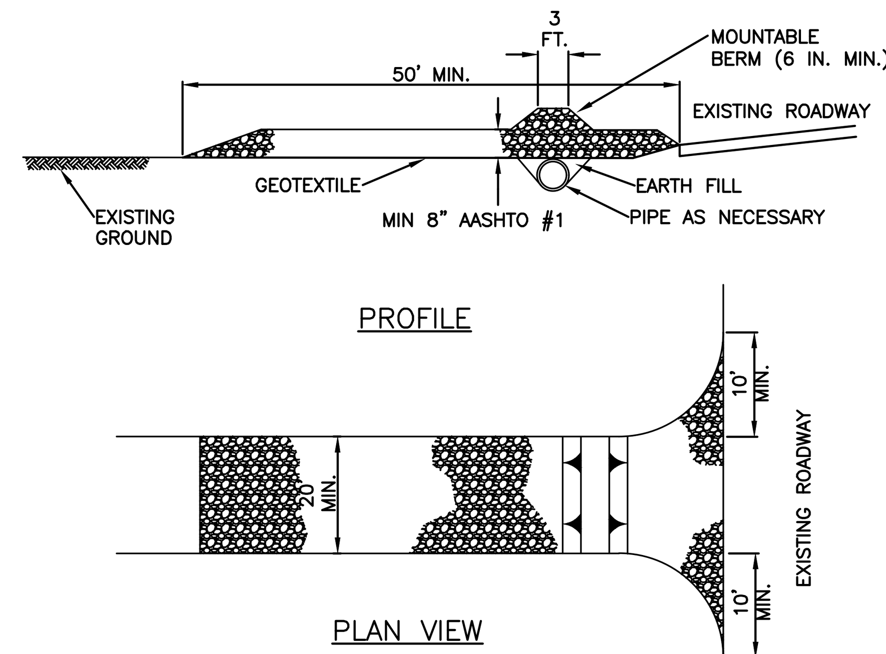
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: LJK/KPK	CHECKED BY: KPK	APPROVED BY: KPK	
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 18-840	

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: **C900**

S:\customers\2018\18-840 CEC 4MR\6. Engineering-Permitting\From CEC\CAD\Design Files (layout stormwater networks grading es limits)\E&S Design Drawing\17496XR-CV01-ES_V1.dwg[PANTHER HOLLOW C900-PLAN] LS:(10/18/2019 - lleemon) - LP: 10/21/2019 12:05 PM

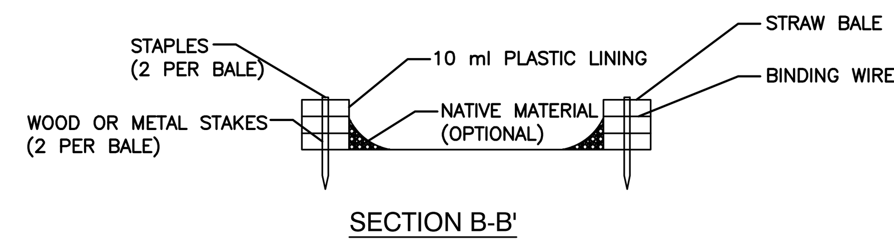


* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE

NOTES:

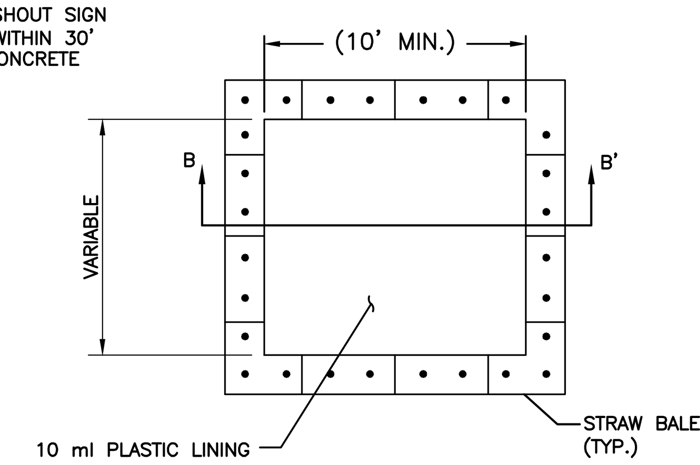
1. REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.
2. RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.
3. MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.
4. MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

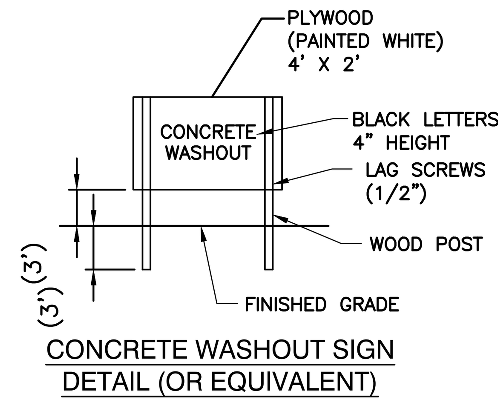
DETAIL 901
PADEP STANDARD CONSTRUCTION DETAIL #3-1
ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE

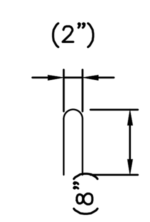


NOTES:

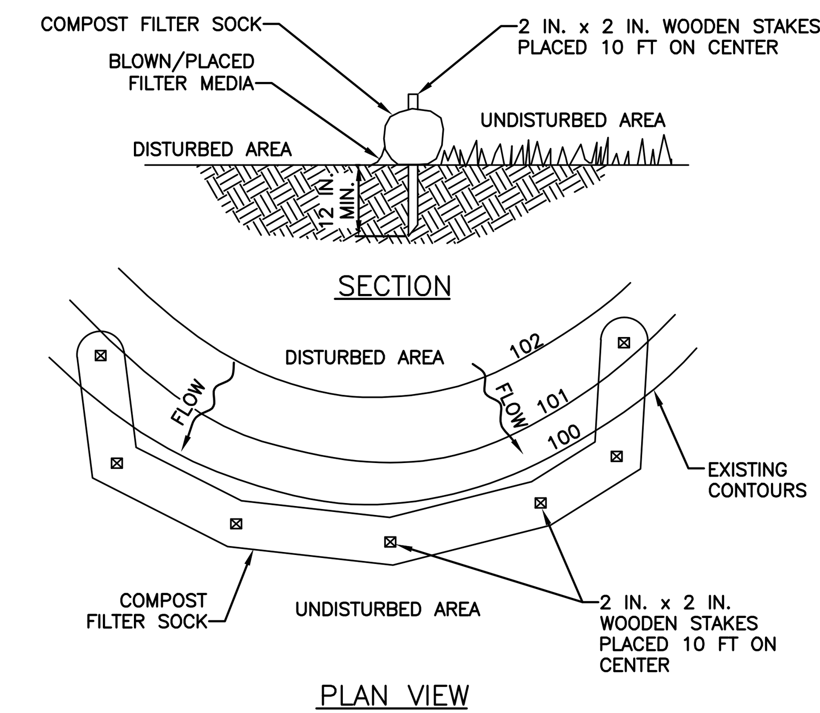
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.







DETAIL 902
TEMPORARY CONCRETE WASHOUT FACILITY
NOT TO SCALE

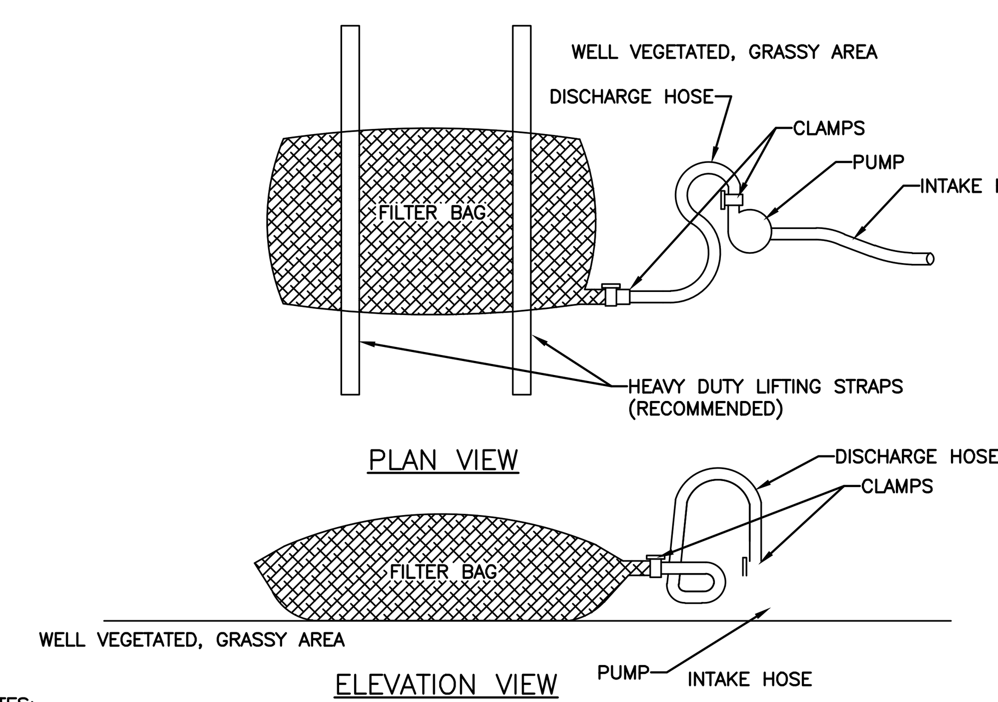


NOTES:

1. SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

SOCK ID	SOCK SIZE
1	18"
2	18"
3	18"

DETAIL 903
PADEP STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK
NOT TO SCALE



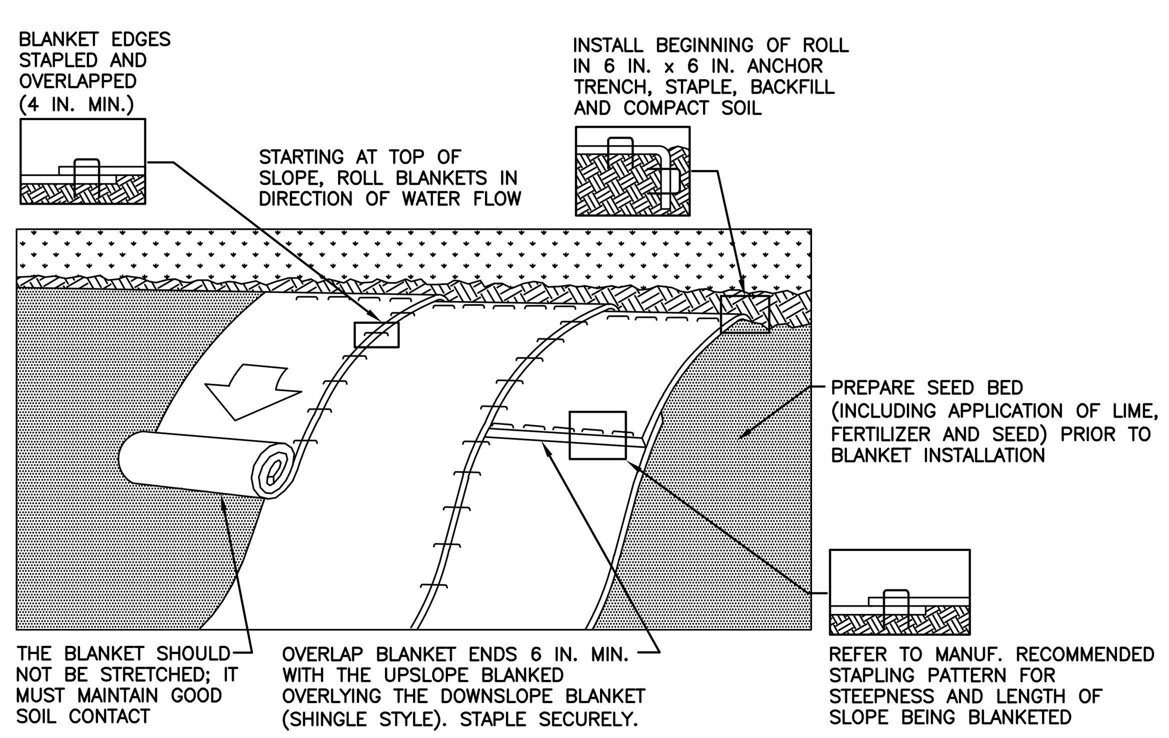
NOTES:

1. LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
3. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
4. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
6. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
7. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

DETAIL 905
STANDARD CONSTRUCTION DETAIL #3-16
PUMPED WATER FILTER BAG
NOT TO SCALE



NOTES:

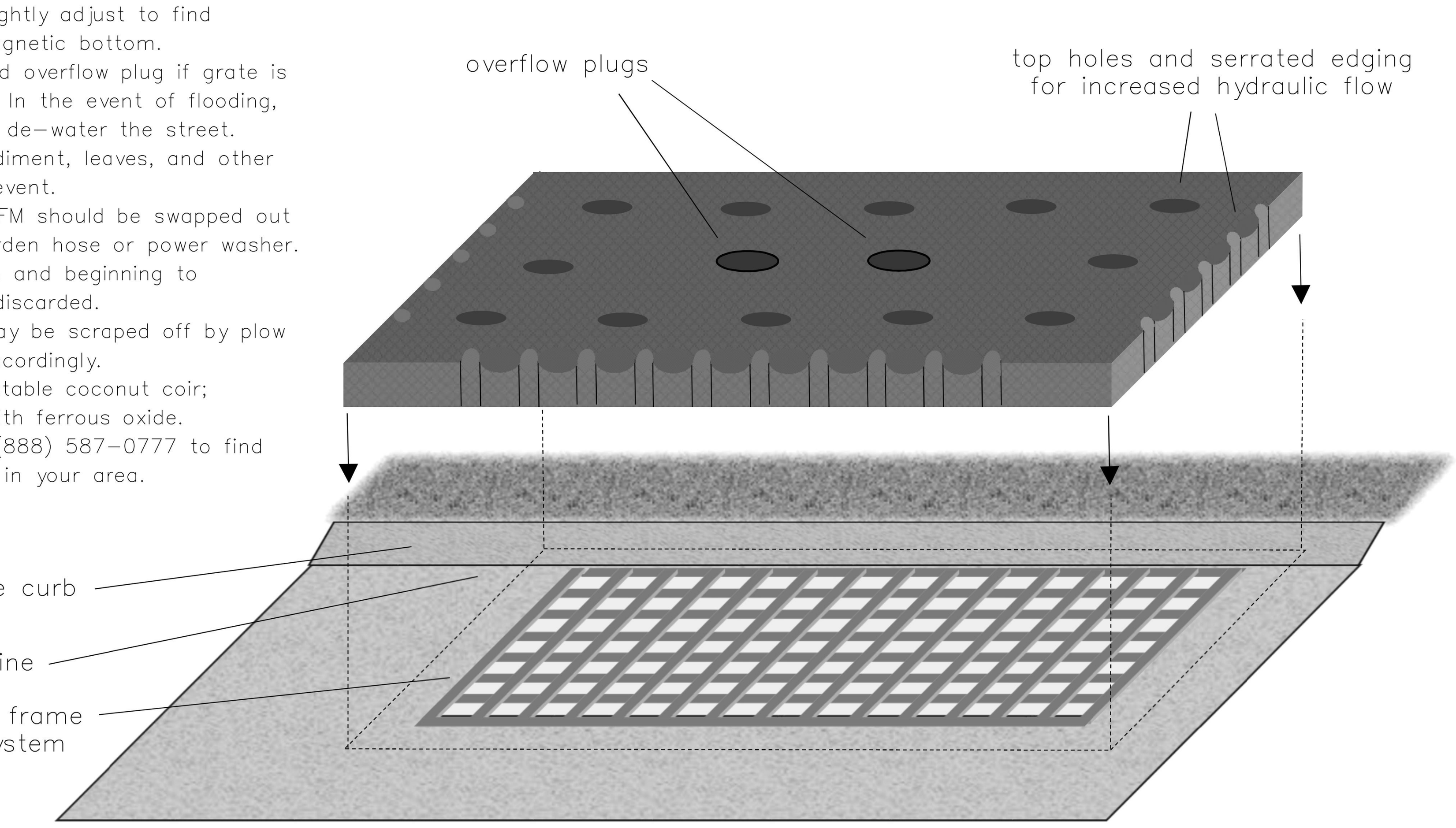
1. SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.
2. PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.
4. BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.
5. THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
6. BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.

DETAIL 904
PADEP STANDARD CONSTRUCTION DETAIL #11-1
EROSION CONTROL BLANKET INSTALLATION
NOT TO SCALE

INSTRUCTIONS

1. Before covering, make sure grate and surrounding area are free of any debris or grit so magnetic bottom can fully contact grate.
2. Lay IFM over grate. Slightly adjust to find snuggest contact of magnetic bottom.
3. Remove at least one red overflow plug if grate is at low point of street. In the event of flooding, pull the second plug to de-water the street.
4. Thoroughly clean off sediment, leaves, and other debris after every rain event.
5. Once full of sediment, IFM should be swapped out for cleaning using a garden hose or power washer.
6. If unit is run over often and beginning to compress it should be discarded.
7. In snowy regions IFM may be scraped off by plow trucks - use product accordingly.
8. Filtering fiber is compostable coconut coir; magnetics are rubber with ferrous oxide.
9. Call MKB Company at (888) 587-0777 to find the Regional Distributor in your area.

DIAMOND SOCK INLET FILTER MAT
(TYPE-M 2X4 INLET)



DETAIL 906
INLET FILTER MAT
NOT TO SCALE

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CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: LJK/KPK	CHECKED BY: KPK	APPROVED BY: KPK	
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 18-840	

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: C901

GENERAL EROSION CONTROL NOTES

1. THE LOCATION OF EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ARE APPROXIMATE AND THOSE SHOWN ARE NOT NECESSARILY ALL THE EXISTING UTILITIES AND STRUCTURES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXACT LOCATION OF ALL ABOVE AND BELOW GROUND UTILITIES AND STRUCTURES PRIOR TO INITIATING CONSTRUCTION ACTIVITIES.

2. THE CONTRACTOR SHALL CONTACT PENNSYLVANIA ONE CALL SYSTEM INC. AT (412) 242-1776 AND THE APPROPRIATE UTILITY COMPANIES AT LEAST THREE (3) DAYS PRIOR TO THE INITIATION OF EARTHMOVING AND DEMOLITION ACTIVITIES.

3. BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE ALLEGHENY COUNTY CONSERVATION DISTRICT (ACCD). THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL PREPARED BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP), BUREAU OF SOIL AND WATER CONSERVATION, LATEST EDITION.

5. ADDITIONAL EROSION AND SEDIMENTATION CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY THE ACCD, OWNER OR TOWNSHIP IN THE EVENT ANY UNFORESEEN PROBLEMS ARISE DURING CONSTRUCTION.

6. THE CONTRACTOR SHALL INSTALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES PRIOR TO ANY SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE AND MAINTAIN THEM UNTIL PERMANENT STABILIZATION IS ESTABLISHED.

7. THE AGGREGATE BASE COURSE SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS IN ORDER TO STABILIZE PARKING AREAS.

8. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES TO BE REMOVED, RELOCATED AND/OR RAZED ARE DISCONNECTED PRIOR TO INITIATING EARTHMOVING ACTIVITIES.

9. THE CONTRACTOR SHALL LANDSCAPE OR VEGETATE DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN 4 DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, STRAW MULCH SHALL BE APPLIED AT A RATE OF THREE (3) TONS PER ACRE OVERTOP EXPOSED AREAS.

10. CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF AT AN APPROVED WASTE SITE. BURNING SHALL NOT BE PERMITTED.

11. AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED BY THE CONTRACTOR TO MAKE IT SUITABLE TO SUPPORT VEGETATIVE GROUND COVER.

12. THE CONTRACTOR SHALL VEGETATE ALL EXPOSED AREAS THAT WILL NOT BE LANDSCAPED WITHIN FOUR (4) DAYS AFTER FINAL GRADING.

13. THE CONTRACTOR SHALL CONTROL DUST WITH WATER OR OTHER METHODS APPROVED BY THE LOCAL SOIL CONSERVATION DISTRICT AND THE OWNER.

14. THE CONTRACTOR SHALL INSTALL COMPOST FILTER SOCKS ALONG THE PERIMETER OF ALL SOIL STOCKPILES.

15. THE CONTRACTOR SHALL INSTALL EROSION CONTROL BLANKETS OVERTOP OF 3:1 (HORIZONTAL: VERTICAL) OR STEEPER SLOPES. EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN S150BN OR APPROVED EQUAL.

16. THE CONTRACTOR SHALL SUBMIT A PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLAN TO THE OWNER PRIOR TO CONSTRUCTION IF CHEMICALS, SOLVENTS OR OTHER HAZARDOUS WASTES OR MATERIALS WITH THE POTENTIAL TO CAUSE ACCIDENTAL POLLUTION DURING EARTHMOVING OR OTHER CONSTRUCTION ACTIVITIES ARE STORED OR USED ON SITE. THE PPC PLAN SHALL BE PREPARED IN ACCORDANCE WITH "GUIDELINES FOR THE DEVELOPMENT AND IMPLEMENTATION OF PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLANS", PREPARED BY PADEP BUREAU OF SOLID WASTE MANAGEMENT AND PADEP BUREAU OF WATER QUALITY MANAGEMENT.

17. THE CONTRACTOR SHALL CONSTRUCT A BERM AROUND AREAS WHERE HYDRAULIC FLUID AND DIESEL FUEL WILL BE STORED DURING CONSTRUCTION TO SERVE AS A CONTAINMENT AREA FOR THE CONTROL OF POSSIBLE SPILLS. ANY SPILL WITHIN THE CONTAINMENT AREA SHALL BE IMMEDIATELY CLEANED. TELEPHONE NUMBERS OF EMERGENCY RESPONSE TEAMS ARE TO BE KEPT ON SITE, AND THEY ARE TO BE NOTIFIED IN THE CASE OF A SPILL.

18. THE CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION.

19. THE CONTRACTOR SHALL PROVIDE THE LOCATION AND ANY APPLICABLE PERMIT NUMBERS OF ALL THE OFF SITE DISPOSAL AND BORROW SITES THAT WILL BE UTILIZED DURING CONSTRUCTION TO THE ACCD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ALSO IDENTIFY THE EROSION AND SEDIMENTATION CONTROL MEASURES, WHICH WILL BE IMPLEMENTED AT THE DISPOSAL AND/OR BORROW SITES. IF THE DISPOSAL AND/OR BORROW SITES ARE UNPERMITTED, AN EROSION AND SEDIMENTATION PLAN MUST BE APPROVED BY THE ACCD PRIOR TO THEIR USE.

20. RUNOFF DRAINS INTO DOWNSTREAM TO JUNCTION HOLLOW.

21. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL SITE INSPECTIONS WILL BE DOCUMENTED IN AN INSPECTION LOG KEPT FOR THIS PURPOSE. THE COMPLIANCE ACTIONS AND THE DATE, TIME AND NAME OF THE PERSON CONDUCTING THE INSPECTION. THE INSPECTION LOG WILL BE KEPT ONSITE AT ALL TIMES AND MADE AVAILABLE TO THE ACCD UPON REQUEST.

22. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING, MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENTATION BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS OR MODIFICATIONS OF THOSE INSTALLED WILL BE NEEDED.

23. WHERE BMPS ARE FOUND TO FAIL TO ALLEVIATE EROSION OR SEDIMENT POLLUTION, THE PERMITTEE OR CO-PERMITTEE SHALL INCLUDE THE FOLLOWING INFORMATION:
   A. THE LOCATION AND SEVERITY OF THE BMP'S FAILURE AND ANY POLLUTION EVENTS.
   B. ALL STEPS TAKEN TO REDUCE, ELIMINATE AND PREVENT THE RECURRENCE OF THE NON-COMPLIANCE.
   C. THE TIME FRAME TO CORRECT THE NON-COMPLIANCE, INCLUDING THE EXACT DATES WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE.

24. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.

25. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS OF THE APPENDIX 64, EROSION CONTROL NOTES RULES AND REGULATIONS, TITLE 25, PART 1, DEPARTMENT OF ENVIRONMENTAL PROTECTION, SUBPART C, PROTECTION OF NATURAL RESOURCES, ARTICLE III, WATER RESOURCES, CHAPTER 102, EROSION CONTROL.

26. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE OPERATOR SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE ACCD, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF LOCATION.

27. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTRIBUTED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.

28. THE RESPONSIBILITY FOR PERFORMING ENVIRONMENTAL DUE DILIGENCE AND THE DETERMINATION OF CLEAN FILL RESIDES WITH THE OPERATOR.

29. PROCEDURES WHICH ENSURE THAT THE PROPER MEASURES FOR THE RECYCLING OR DISPOSAL OF MATERIALS ASSOCIATED WITH OR FROM THE PROJECT SITE WILL BE UNDERTAKEN IN ACCORDANCE WITH THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTIONS, TITLE 25, CHAPTER 102.4 #5 SECTION XI.

30. A LICENSED PROFESSIONAL OR THEIR DESIGNEE SHALL BE PRESENT ON THE PROJECT SITE DURING THE CONSTRUCTION OF ALL BMP's.

CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON-WATER SOLUBLE, NON-DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE.)

CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP-1A AND FP-1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. A COPY OF FORM FP-001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.

ENVIRONMENTAL DUE DILIGENCE: INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE.

TEMPORARY CONTROL MEASURES

THE E&S CONTROL FACILITIES PROPOSED FOR THE PROPOSED PANTHER HOLLOW LAKE PROJECT ARE SHOWN ON THE E&S CONTROL PLAN. CONTROL MEASURES SHOWN ON THIS PLAN ARE MINIMUM CONTROLS TO REDUCE THE POTENTIAL FOR OFFSITE AREAS TO RECEIVE SEDIMENT-LADEN RUNOFF. ADDITIONAL CONTROLS MAY BE REQUIRED DEPENDING ON THE PROGRESS OF CONSTRUCTION AND VARYING CONDITIONS ENCOUNTERED.

1. ROCK CONSTRUCTION ENTRANCE

ROCK CONSTRUCTION ENTRANCES WILL BE PROVIDED AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.

INSTALLATION: TO CONSTRUCT THE PAD, PLACE A LAYER OF GEOTEXTILE AND AN INITIAL 2 TO 3 INCHES OF STONE ACROSS THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA. THE STONE PAD SHOULD BE AT LEAST 50 FEET IN LENGTH, 20 FEET IN WIDTH, AND 8 INCHES THICK. COMPLETE THE PLACEMENT OF STONE TO THE REQUIRED THICKNESS.

2. SILT SOCK

SILT SOCK SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED. VARIOUS FILTER SOCK SIZES SHALL BE INSTALLED, AS INDICATED, AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAILS PROVIDED.

INSTALLATION:
1. SILT SOCK SHALL BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER DISTURBED AREA, PERPENDICULAR TO SHEET FLOW.
2. STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE SILT SOCK ON 10 FT. CENTERS, USING 2-INCH BY 2-INCH BY 3-FOOT WOODEN STAKES.
3. STAKING DEPTH FOR SAND AND SILT LOAM SOILS SHALL BE 12-INCH, AND 8-INCH FOR CLAY SOILS.
4. LOOSE COMPOST MAY BE BACKFILLED ALONG THE UPSLOPE SIDE OF THE SILT SOCK, FILLING THE SEAM BETWEEN THE SOIL SURFACE AND THE DEVICE, IMPROVING FILTRATION AND SEDIMENT RETENTION.

MAINTENANCE:
1. SILT SOCKS SHOULD BE REGULARLY INSPECTED TO MAKE SURE THEY HOLD THEIR SHAPE AND ARE PRODUCING ADEQUATE FLOW THROUGH.
2. IF PONDING BECOMES EXCESSIVE, AND SEDIMENT REACHES THE TOP OF THE FILTER SOCK, ADDITIONAL FILTER SOCKS SHOULD BE ADDED IN THE AREAS WITHOUT DISTURBANCE OF SOIL OR COLLECTED SEDIMENT.

WHEN CONSTRUCTION IS COMPLETED ON SITE, THE SILT SOCKS MAY BE DISPERSED WITH A LOADER, RAKE, BULLDOZER OR OTHER DEVICE TO BE INCORPORATED IN THE SOIL OR LEFT ON TOP OF THE SOIL FOR FINAL SEEDING TO OCCUR. THE MESH NETTING MATERIAL SHALL BE COLLECTED AND DISPOSED OF IN A NORMAL TRASH CONTAINER OR REMOVED BY THE CONTRACTOR. IN CASES WHERE BIODEGRADABLE OR PHOTODEGRADABLE PRODUCTS ARE USED, THEY MAY BE LEFT ONSITE AT THE DIRECTION OF THE OWNER.

3. TEMPORARY VEGETATIVE STABILIZATION

INSTALLATION: FERTILIZING, SEEDING, AND MULCHING WILL BE USED AS A TEMPORARY E&S CONTROL MEASURE ON ALL NON-PAVED DISTURBED AREAS. EXPOSED SOILS NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL NOT REMAIN UNSEEDED OR COVERED BY MULCH FOR MORE THAN 4 DAYS, INCLUDING STOCKPILED SOIL MATERIALS. WITH REGARD TO THE TEMPORARY SEED MIX, REFER TO THE SEEDING MIXTURE TABLE PROVIDED ON THE E&S CONTROL PLAN DETAIL SHEET.

WHERE SLOPES PERMIT, PROMPTLY DISK ALL AMENDMENTS UNDER A 3- TO 6-INCH DEPTH. WHERE SLOPES DO NOT PERMIT TILLAGE, TRACK SLOPE WITH A DOZER AS DESCRIBED UNDER SEEDBED PREPARATION. ON EXTREMELY STEEP SLOPES, AMENDMENTS MAY BE APPLIED WITH THE SEED AND MULCH USING A HYDROSEEDER AS LONG AS SEED AND INOCULANT IS NOT IN A SLURRY WITH FERTILIZERS FOR MORE THAN ONE HOUR.

PREPARE SEEDBED BY CULTIPACKING OR TRACKING WITH A DOZER USING EQUIPMENT (SUCH AS A LIGHT TRACTOR) AND TECHNIQUES THAT MINIMIZE RUTTING OF THE SURFACE. IF TRACKING IS DONE, RUN DOZER SO TRACK MARKS ARE PARALLEL TO SITE CONTOURS. IF A BRILLION SEEDER IS USED, THIS STEP MAY BE SKIPPED.

JUST BEFORE SEEDING, INOCULATE BIRDSFOOT TREFOIL SEED (WHERE APPLICABLE) WITH LEGUME INOCULANT APPROPRIATE FOR BIRDSFOOT TREFOIL USING AT LEAST FIVE TIMES THE MANUFACTURER'S MINIMUM INOCULANT APPLICATION RATES, THEN EVENLY APPLY THE APPROPRIATE SEED MIXTURE.

LIGHTLY CULTIPACK TO PRESS SEED INTO SEEDBED USING EQUIPMENT (SUCH AS A LIGHT TRACTOR) AND TECHNIQUE THAT MINIMIZES RUTTING OF THE SURFACE. IF A BRILLION SEEDER IS USED, THIS STEP MAY BE CONSIDERED COMPLETE. IF SLOPES ARE TOO STEEP TO PERMIT SEED PREPARATION AND PLACEMENT, USE HYDROSEEDING TECHNIQUES.

PROMPTLY AND EVENLY APPLY STRAW (NOT HAY) MULCH AT A RATE OF 3 TONS PER ACRE USING A BALE-BUSTER OR USING WOOD CELLULOSE FIBER (NOT PAPER PULP) HYDROMULCH AT A RATE OF 3,000 POUNDS PER ACRE. PROMPTLY TACK STRAW INTO PLACE USING ONE OF THE FOLLOWING METHODS: 1) APPLY 'HYDROAM (LINEAR POLYACRILAMIDE POLYMER) DISTRIBUTED BY POLYMERS, INC. (WWW.WATERSORB.COM OR 501-623-9995) WITH WATER OVER STRAW AT A RATE OF 8 POUNDS PER ACRE; 2) APPLY 800 TO 1,000 POUNDS PER ACRE APPLICATION OF WOOD CELLULOSE FIBER MULCH WITH A HYDROSEEDER OVER THE STRAW; OR 3) USE A CRIMPER DISK (A SPECIALLY DESIGNED HEAVY DISK WITH NO OFFSET TO THE DIRECTION OF TRAVEL). MAKE MULTIPLE PASSES WITH THE CRIMPER AS NECESSARY TO SECURE THE STRAW.

4. INLET PROTECTION

INLET PROTECTION FILTERS CONSISTING OF INLET FILTER BAGS OR STONE AND GRAVEL WILL BE PROVIDED AT ALL STORM SEWER INLETS AS THEY ARE INSTALLED TO FILTER SEDIMENT-LADEN WATER PRIOR TO ENTERING THE STORM SEWER SYSTEM.

INSTALLATION: THE INLET PROTECTION FILTERS SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLAN AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

5. TOPSOIL STOCKPILE AREA

INSTALLATION: THERE WILL BE A DESIGNATED TOPSOIL STOCKPILE AREA LOCATED ON THE PROPERTY. THE LOCATION SHALL BE AS SHOWN ON THE E&S SITE PLANS AND ALL TOPSOIL AND EXCESS CUT MATERIAL FROM THE SITE SHALL BE STOCKPILED THERE. THE STOCKPILE WILL BE SURROUNDED WITH A MINIMUM 18" SILT SOCK TO PREVENT SEDIMENT-LADEN RUNOFF.

6. EROSION CONTROL BLANKET

THE NORTH AMERICAN GREEN S150BN EROSION CONTROL BLANKET, OR AN APPROVED EQUAL, SHALL BE INSTALLED ON ALL SLOPES 3:1 OR STEEPER.

INSTALLATION: INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

7. CONSTRUCTION WASTE RECYCLING/DISPOSAL

CONSTRUCTION WASTES ARE REFUSE MATERIALS GENERATED DURING THE COURSE OF CONSTRUCTION AND INCLUDE, BUT ARE NOT LIMITED TO, PAPER, PLASTIC, WOOD, FOOD, TEXTILE, AND METAL PRODUCTS.

INSTALLATION: THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING WASTE RECYCLING/DISPOSAL AREAS ON THE EROSION AND SEDIMENT CONTROL PLANS ONCE THEY HAVE BEEN DETERMINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL WASTE RECYCLING/DISPOSAL PERMITS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

MAINTENANCE: ALL CONSTRUCTION WASTE SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF AT A STATE APPROVED WASTE SITE AND IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS. THE BURNING OF WASTE MATERIALS SHALL NOT BE PERMITTED.

TEMPORARY CONTROL MEASURES

10. SILT FILTER BAG

FILTER BAGS MAY BE USED, IF NECESSARY, TO PREVENT SEDIMENT LADEN WATER THAT MAY BE PUMPED FROM TRENCHES FROM DISCHARGING INTO WETLANDS AND STREAMS OR OFFSITE. THEY SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL AND SHALL TRAP PARTICLES LARGER THAN 150 MICRONS. PUMPING RATES SHALL NOT EXCEED ONE-HALF MANUFACTURER'S SPECIFICATIONS, OR 750 SPM, WHICHEVER IS LESS. THE FOLLOWING INSTRUCTIONS SHALL SPECIFY CONDITIONS FOR ITS USE.

INSTALLATION:
1. INSTALL BAGS ON A WELL-VEGETATED, EROSION-RESISTANT AREA.
2. BAGS SHALL NOT BE PLACED ON A SLOPE GREATER THAN 5%.
3. BAGS MUST BE PLACED ON A DRY AREA, AWAY FROM STREAMS AND WETLANDS.
4. PUMP INTAKES SHOULD BE FLOATING AND SCREENED.

MAINTENANCE:
1. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE UNTIL THE PROBLEM IS CORRECTED.
2. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME HALF FULL.
3. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES MUST BE PROVIDED.
4. SPARE BAGS SHALL BE KEPT AVAILABLE ONSITE.
5. ALL CLEAN OUT MATERIAL SHALL BE DISCARDED IN AN UPLAND AREA, REMOTE OF ANY STREAM OR WETLAND, WITHIN THE CONSTRUCTION RIGHT-OF-WAY. ALL AREAS WILL BE STABILIZED.

11. CONCRETE WASHOUT

CONCRETE WASHOUTS SHALL BE CONSTRUCTED ONSITE TO CONTAIN ALL WASHOUT WATER FROM CONCRETE CONSTRUCTION ACTIVITIES. WASHOUTS SHALL BE CLEARLY MARKED.

INSTALLATION: WASHOUTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.

MAINTENANCE: WASHOUTS SHALL BE CLEANED OUT WHEN ACCUMULATED MATERIALS TAKE UP TWO-THIRDS OF THE AVAILABLE STORAGE CAPACITY. MATERIALS SHALL BE DISPOSED OF IN A PADEP-APPROVED FACILITY. MAKE ANY REPAIRS TO THE CONTAINMENT FACILITY AS NEEDED.

12. TRENCH PLUGS

TRENCH PLUGS SHALL BE INSTALLED AS NEEDED DURING ALL TRENCHING ACTIVITIES, IN ACCORDANCE WITH THE STANDARD DETAILS.

INSTALLATION:
1. PIPELINES WITH JOINTS THAT ALLOW A MANUFACTURED LENGTH OF PIPE TO BE PLACED IN THE TRENCH WITH THE PIPE JOINT ASSEMBLED IN THE TRENCH REQUIRE AN OPEN TRENCH THAT IS ONLY SLIGHTLY LONGER THAN THE LENGTH OF PIPE BEING INSTALLED.
2. THE TOTAL LENGTH OF EXCAVATED TRENCH OPEN AT ANY ONE TIME SHOULD NOT BE GREATER THAN THE TOTAL LENGTH OF PIPELINE/UTILITY LINE THAT CAN BE PLACED IN THE TRENCH AND BACKFILLED IN ONE WORKING DAY.
3. NO MORE THAN 50 FEET OF OPEN TRENCH SHOULD EXIST WHEN PIPELINE/UTILITY LINE INSTALLATION CEASED AT THE END OF THE WORKDAY.
4. TRENCH PLUGS ARE REQUIRED AT ALL WATER-BODY CROSSINGS REGARDLESS OF TRENCH SLOPE.
5. TOPSOIL MAY NOT BE USED TO FILL SACKS.

13. OUTLET PROTECTION

INSTALLATION: OUTLET PROTECTION WILL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH STANDARD DETAIL TO PREVENT SCOUR FROM EXCESSIVE VELOCITIES.

MAINTENANCE: ADDITIONAL STONE MAY HAVE TO BE ADDED PERIODICALLY TO MAINTAIN THE PROPER FUNCTIONING OF THE APRON.

STANDARD E&S WORKSHEET # 21
Temporary and Permanent Vegetative Stabilization Specifications

PROJECT NAME: Four Mile Run - Panther Hollow Lake
LOCATION: City of Pittsburgh, Allegheny County, PA
PREPARED BY: LJK DATE: 10/17/2019
CHECKED BY: KPK DATE: 10/17/2019

SPECIFICATIONS: The Department recommends the use of the Penn State publication, "Erosion Control and Conservation Plantings on Noncropland," as the standard to use for the selection of species, seed specifications, mixtures, liming and fertilizing, time of seeding, and seeding methods. Specifications for these items may also be obtained from PennDOT's Publication # 408, Section 804 or by contacting the applicable county conservation district. Upon selection of a reference, that reference should be used to provide all specifications for seeding, mulching, and soil amendments. The following specification will be used for this project:

(TEMPORARY)

*SPECIES:	ANNUAL RYE (PENNDOT FORMULA)	
% PURE LIVE SEED:	98%	%
APPLICATION RATE:	100	LB./ACRE
FERTILIZER TYPE:	10-20-20	(X-X-X)
FERTILIZER APPL. RATE:	680	LB./ACRE
LIMING RATE:	6.0	T./ACRE
MULCH TYPE:	STRAW	
MULCHING RATE:	3.0	T./ACRE

(PERMANENT)

TOPSOIL PLACEMENT DEPTH:	8"	IN.
*SPECIES:	20% PERENIAL RYE, 50% KENTUCKY BLUE, 30% CREEPING RED FESQUE	
% PURE LIVE SEED:	98%	%
APPLICATION RATE	200	LB./ACRE
FERTILIZER TYPE:	10-20-20	(X-X-X)
FERTILIZER APPL. RATE:	680	LB./ACRE
LIMING RATE:	6.0	T./ACRE
MULCH TYPE:	STRAW	
MULCHING RATE:	3.0	T./ACRE
ANCHOR MATERIAL:	N/A	
ANCHORING METHOD:	N/A	
RATE OF ANCHOR MATERIAL APPL.:	N/A	LB./ACRE
SEEDING SEASON DATES:	MARCH 15 - JUNE 1 / AUG 1 - OCT 15	

(PERMANENT - STEEP SLOPE)

TOPSOIL PLACEMENT DEPTH:	6"	IN.
*SPECIES:	30% ANNUAL RYE, 30% KENTUCKY 31 TALL FESCUE, 15% WHITE CLOVER, 15% CLIMAX TIMOTHY, 10% REDTOP	
% PURE LIVE SEED:	98%	%
APPLICATION RATE:	200	LB./ACRE
FERTILIZER TYPE:	10-20-20	(X-X-X)
FERTILIZER APPL. RATE:	680	LB./ACRE
LIMING RATE:	6.0	T./ACRE
MULCH TYPE:	STRAW	
MULCHING RATE:	3.0	T./ACRE
ANCHOR MATERIAL:	NORTH AMERICAN GREEN S150 STRAW BLANKET	
ANCHORING METHOD:	PER MANUFACTURERS SPECIFICATIONS	
RATE OF ANCHOR MATERIAL APPL.:	PER MANUFACTURERS SPECIFICATIONS	LB./ACRE
SEEDING SEASON DATES:	MARCH 15 - JUNE 1 / AUG 1 - OCT 15	

*If more than one species is used, indicate application rate for each species.
Note: This worksheet should be added to the plan drawings.

363-2134-008 / March 31, 2012 / Page 392

DRAFT

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

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4MR

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: LJK/KPK	CHECKED BY: KPK	APPROVED BY: KPK	
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 18-840	

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: C902

S:\customers\2018\18-840 CEC 4MR\6. Engineering-Permitting\From CEC\CAD Ddeesign Files (layout stormwater networks grading es limits)\E&S Design Drawing\174960XR-CV01-ES_V1.dwg{PANTHER HOLLOW C902-NOTES} LS:(10/18/2019 - lkeenan) - LP: 10/21/2019 12:08 PM

TEMPORARY/PERMANENT VEGETATIVE STABILIZATION

INSTALLATION: FERTILIZING, SEEDING, AND MULCHING WILL BE USED AS A TEMPORARY/PERMANENT E&S CONTROL MEASURE ON ALL NON-PAVED DISTURBED AREAS. EXPOSED SOILS, NOT SUBJECT TO CONSTRUCTION TRAFFIC, SHALL NOT REMAIN UNSEEDED OR UNCOVERED BY MULCH FOR MORE THAN 4 DAYS, INCLUDING STOCKPILED SOIL MATERIALS. WITH REGARD TO THE TEMPORARY/PERMANENT SEED MIXES, REFER TO THE SEEDING MIXTURE TABLES PROVIDED. UNLESS THE OWNER'S REPRESENTATIVE DIRECTS OTHERWISE, VEGETATION SHALL BE ESTABLISHED AS FOLLOWS.

1. SOIL PLACEMENT: SOIL SHALL BE PLACED TO THE DESIGN THICKNESS AND GRADE AND TRACKED AND ROLLED INTO PLACE IN A MANNER THAT WILL NOT CAUSE EXCESSIVE COMPACTION. IF SOIL DENSITY IS VERIFIED IN THE FIELD, SOIL SHALL BE COMPACTED TO A DRY DENSITY BETWEEN 75 AND 100 POUNDS PER CUBIC FOOT, AFTER CORRECTION TO ZERO PERCENT COARSE FRAGMENT (PARTICLES LARGER THAN 2 MILLIMETERS) CONTENT.
2. SOIL TESTING AND SOIL AMENDMENT (LIME AND FERTILIZER) RATES: UNLESS SOIL TEST RESULTS AND RECOMMENDATIONS FROM THE STATE AGRICULTURAL EXTENSION SERVICE LABORATORY (PENN STATE AGRICULTURAL ANALYTICAL SERVICES LABORATORY [814-863-0841] OR EQUIVALENT SOIL TESTING LABORATORY) INDICATE OTHERWISE, EVENLY APPLY: 1) AGRICULTURAL GRADE GROUND LIMESTONE AT A RATE OF 6 TONS PER ACRE (CALCIUM CARBONATE EQUIVALENT BASIS); 2) FERTILIZERS TO SUPPLY 100-200-200 POUNDS PER ACRE N-P205-K20 (EXAMPLE: 10-20-20 FERTILIZER AT A RATE OF 1000 POUNDS PER ACRE); AND, 3) "BIOPAK" MICROBIAL SOIL INOCULANT (DISTRIBUTED BY PLANT HEALTH CARE, INC. [WWW.PLANTHEALTHCARE.COM OR 800-421-9051]). IF APPROVED PASTEURIZED PELLETIZED POULTRY MANURE (PASTEURIZED PPM) WITH AN ANALYSIS OF AT LEAST 4-2-3 (PERCENT N-P205-K20) IS USED, IT WILL BE ASSUMED THAT ONE TON MANURE WILL SUBSTITUTE FOR 60-40-60 POUNDS N-P205-K20 AVAILABLE IN THE FIRST YEAR. A PRE-APPROVED SOURCE OF PASTEURIZED PPM IS "MICRO-START60" AS MANUFACTURED BY PERDUE AGRIRECYCLE, LLC (WWW.MICROSTART60.COM <HTTP://WWW.MICROSTART60.COM> OR 302-628-2360).
3. SOIL AMENDMENT INCORPORATION: PROMPTLY TILL UNDER THE LIME AND FERTILIZER TO A DEPTH OF 2 TO 4 INCHES USING A DISK, HARROW, PLOW, ROTOTILLER OR OTHER SUITABLE EQUIPMENT. IF LIME REQUIREMENTS ARE LESS THAN 4 TONS PER ACRE OR SLOPES ARE TOO STEEP TO PERMIT SAFE TILLAGE, THE SOIL AMENDMENTS CAN BE MIXED INTO A HYDROMULCH SLURRY OR CAN BE TRACKED IN WITH A DOZER IN LIEU OF INCORPORATION. IF TRACKING THE SITE WITH A DOZER, TRACK IN A MANNER THAT LEAVES CLEAT MARKS PARALLEL TO SITE CONTOURS.
4. TEMPORARY SEEDING THAT WILL NOT BE FOLLOWED BY PERMANENT SEEDING, SUCH AS TOPSOIL STOCKPILES OR INTERIM GRADING PATTERNS, DO NOT REQUIRE THE APPLICATION OF SLOW RELEASE FERTILIZER OR "BIOPAK" INOCULANT.
5. SEEDBED PREPARATION: JUST BEFORE SEEDING, PREPARE SEEDBED BY TRACKING, RAKING, OR OTHER APPROPRIATE METHOD AS NECESSARY TO BREAK UP SOIL CRUSTS. IF TRACKING THE SITE WITH A DOZER, TRACK IN A MANNER THAT LEAVES CLEAT MARKS PARALLEL TO SITE CONTOURS.
6. SEEDING: EVENLY APPLY THE TEMPORARY/PERMANENT SEED MIXTURES USING HYDROSEEDING, BROADCAST, OR DRILL SEEDING METHODS THAT PLANT SEED LESS THAN ¼-INCH BELOW THE GROUND SURFACE: APPLY LEGUME SEED INOCULANTS SPECIFICALLY MADE FOR THE LEGUME SEED TYPE BEING APPLIED AT FIVE TIMES THE MANUFACTURER'S RECOMMENDED RATE. USE NO SEED OR INOCULANT THAT HAS BEEN IMPROPERLY STORED, EXPIRED, OR SEED OLDER THAN 9 MONTHS FROM THE SEED TEST DATE. IF HYDROSEEDING METHODS ARE USED SEED, INOCULANTS, FERTILIZERS, AND POLYMER TACKIFIER/SOIL STABILIZER (BELOW) MAY BE APPLIED IN ONE APPLICATION, PROVIDED THAT SEED AND INOCULANTS ARE NOT HELD IN A SLURRY WITH FERTILIZERS FOR MORE THAN ONE HOUR.
7. MULCHING AND TACKING: PROMPTLY AFTER SEEDING, MULCH USING EITHER: 1) "CURLEX" OR EQUIVALENT BRAND OF WOOD EXCELSIOR EROSION CONTROL BLANKET; 2) SYNTHETIC INDUSTRIES "TRM 450" OR NORTH AMERICAN GREEN "P-300" TURF REINFORCEMENT MAT; 3) STRAW APPLIED AT A RATE OF 6000 POUNDS PER ACRE, OR 4) WOOD/CELLULOSE FIBER HYDROMULCH APPLIED WITH A HYDROSEEDER AT A RATE OF 3000 POUNDS PER ACRE. WOOD/CELLULOSE FIBER HYDROMULCH MUST CONTAIN AT LEAST 50% VIRGIN WOOD FIBER. IF AT LEAST 1000 POUNDS PER ACRE APPROVED PASTEURIZED PPM IS BEING APPLIED WITH A HYDROSEEDER, WOOD/CELLULOSE FIBER HYDROMULCH RATES MAY BE REDUCED TO 2500 POUNDS PER ACRE.

   IN SOME LOCATIONS SHOWN ON THE DRAWINGS, SUCH AS SLOPES STEEPER THAN 3:1 (H:V), EROSION CONTROL BLANKET OR TURF REINFORCEMENT MAT (TRM) MAY BE THE ONLY PERMISSIBLE MULCHING OPTION. INSTALL EROSION CONTROL BLANKETS/TRM PER MANUFACTURER'S INSTRUCTIONS. STAPLE BLANKET/TRM IN PLACE USING 6-INCH (MINIMUM) SOD STAPLES IN ROWS AT THE EDGES AND CENTERLINE OF THE BLANKET AND ON 24-INCH OR CLOSER CENTERS.

   TACK STRAW IN PLACE USING EITHER: 1) A CRIMPER DISK, 2) WOOD/CELLULOSE FIBER HYDROMULCH APPLIED OVER THE STRAW AT A RATE OF 800-1000 POUNDS PER ACRE, OR, 3) WATER SOLUBLE LINEAR POLYACRYLATE (SODIUM ACRYLATE/ACRYLAMIDE) COPOLYMER "POLYMER" AT A RATE OF AT LEAST 8 POUNDS PER ACRE APPLIED IN MIXTURE WITH WATER OVER THE STRAW. APPROVED POLYMER BRANDS INCLUDE "WATERSORBTM PAM" OR "HYDROPAMTM", DISTRIBUTED BY POLYMERS, INC. (WWW.WATERSORB.COM OR 501-623-9995), "TERRAPAMTM", DISTRIBUTED BY PLANT HEALTH CARE, INC. (WWW.PLANTHEALTHCARE.COM OR 800-421-9051), AND "HYDROGEL BTM", DISTRIBUTED BY FINN CORPORATION (WWW.FINNCORP.COM OR 800-543-7166).

   TACK WOOD/CELLULOSE FIBER HYDROMULCH IN PLACE USING "POLYMER" SPECIFIED ABOVE AT A RATE OF AT LEAST 4 POUNDS PER ACRE APPLIED IN A SLURRY WITH THE HYDROMULCH.
8. OVER-SEEDING AND RE-SEEDING: WHEN THE SITE DEVELOPMENT STAGING OR SEASON WILL NOT PERMIT TIMELY SOWING OF THE PERMANENT SEED MIXTURE(S), PREPARE SOILS (FERTILIZERS AND LIME) AS FOR PERMANENT SEEDING, THEN SEED WITH TEMPORARY SEED MIXTURE AND MULCH, THEN OVERSOW THE PERENNIAL SEED MIXTURE INTO THE STUBBLE OF TEMPORARY VEGETATION AT THE NEXT APPROPRIATE SEEDING SEASON.

IF PERENNIAL SEED IS BEING SOWN INTO THE STUBBLE OF ACTIVELY GROWING TEMPORARY VEGETATION, MOW THE TEMPORARY VEGETATION TO REDUCE COMPETITION EITHER BEFORE OR IMMEDIATELY AFTER SOWING THE PERMANENT SEED.

MAINTENANCE: WATER AS NECESSARY TO ESTABLISH AND MAINTAIN VEGETATION. IN MOWED AREAS, MOW TO MAINTAIN GRASS HEIGHT BETWEEN 4 AND 6 INCHES TALL FOR FIRST TWO MONTHS OF GROWTH DURING THE ESTABLISHMENT YEAR, AND TO THE DESIRED HEIGHT THEREAFTER. IF STRING TRIMMERS ARE USED, TAKE MEASURES TO AVOID DAMAGE TO BARK OF TREES AND SHRUBS.

TABLE 4.1 COMPOST FILTER SOCK FABRIC MINIMUM SPECIFICATION

MATERIAL TYPE	3 MIL HDPE	5 MIL HDPE	5 MIL HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18'	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/8"
TENSILE STENGTH		26 PSI	26 PSI	44 PSI	202 PSI
ULTRAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% AT 1000 HR.	23% AT 1000 HR.		100% AT 1000 HR.	100% AT 1000 HR.
MINIMUM FUNCTIONAL LONGGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING	HDPE BIAXIAL NET				
	CONTINUOUSLY WOUND				
	FUSION-WELDED JUNCTURES				
	3/4" X 3/4" MAX. APERTURE SIZE				
OUTER FILTRATION MESH	COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH)				
	3/16" MAX. APERTURE SIZE				
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS					

MAINTENANCE PROGRAM

ALL E&S CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER (CLEANED, REPAIRED, ETC.) UNTIL ALL DISTURBED TRIBUTARY AREAS ARE STABILIZED. ALL TEMPORARY E&S CONTROLS WILL REMAIN IN PLACE UNTIL A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE, THE OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL PERMANENT FACILITIES.

1. ALL TEMPORARY RUNOFF E&S CONTROLS SHALL BE INSPECTED AT LEAST AT THE BEGINNING AND END OF EACH DAY AND AFTER EACH RUNOFF EVENT TO MAINTAIN THEIR EFFECTIVENESS. ANY DAMAGED CONTROLS SHALL BE REPAIRED OR REPLACED BY THE END OF THE WORKING DAY.
2. ROCK CONSTRUCTION ENTRANCE: ADDITIONAL STONE SHALL BE ADDED TO THE ROCK CONSTRUCTION ENTRANCE AND/OR ACCESS ROADS AS NEEDED TO MAINTAIN THEIR THICKNESS.
3. SILT SOCK: ACCUMULATED SEDIMENTS SHALL BE REMOVED, AS REQUIRED, IN ALL CASES WHERE ACCUMULATIONS HAVE REACHED HALF THE ABOVE-GROUND HEIGHT OF THE SOCK. IF THE SOCK HAS BEEN DAMAGED, IT SHALL BE REPAIRED, OR REPLACED IF BEYOND REPAIR. THE FILTER MEDIA WILL BE DISPERSED ON SITE ONCE THE DISTURBED AREA HAS BEEN PERMANENTLY STABILIZED. ADHERE TO ALL MANUFACTURERS' RECOMMENDATIONS.
4. INLET PROTECTION FILTER BAGS: ALL INLET PROTECTION FILTER BAGS SHALL BE CLEANED AND/OR REPLACED WHEN THE BAG IS HALF FULL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL DAMAGED FILTER BAGS SHALL BE REPLACED. THE ACCUMULATED SEDIMENT SHALL BE DISTRIBUTED EVENLY AMONG THE SITE AND STABILIZED.
5. SEDIMENT BASIN/TRAP: INSPECT THE SEDIMENT BASINS ON AT LEAST A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. REPAIR CLOGGED OR DAMAGED SPILLWAYS IMMEDIATELY. THE ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE SEDIMENT STORAGE (SD) ELEVATION WITHIN THE TRAP/BASIN IS ACHIEVED. DISTRIBUTE THE ACCUMULATED SEDIMENT EVENLY ACROSS THE SITE AND STABILIZE.
6. ALL SLOPES SHALL BE CHECKED FOR SIGNS OF EROSION AND/OR SEDIMENTATION.
7. ALL DISCHARGE LOCATIONS SHALL BE INSPECTED TO ASCERTAIN THE EFFECTIVENESS OF THE CONTROLS. ADDITIONAL CONTROL MEASURES SHALL BE IMPLEMENTED AS NEEDED.
8. DURING CONSTRUCTION, SEDIMENT REMOVED FROM THE EROSION CONTROL DEVICES SHALL BE DISPOSED OF BY SPREADING IT ONSITE. ONCE A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED AND THE TEMPORARY E&S CONTROLS ARE REMOVED, ALL ACCUMULATED SEDIMENT WILL BE DISPOSED OF AT A PADEP APPROVED FACILITY.
9. ALL SITE ENTRANCE AND EXIT POINTS SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE TRACKING OF MUD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CLEAN STREETS OF MUD AND KEEP THE STREETS IN A CLEAN AND DUST-FREE CONDITION.
10. SEEDED AND VEGETATED AREAS SHALL BE CHECKED REGULARLY TO INSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEEDED AS NECESSARY.
11. THE CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE AND INSPECTIONS, AND SHALL MAINTAIN RECORDS OF ALL INSPECTIONS. INSPECTIONS SHOULD BE LOGGED ON PADEP FORM 3150-FM-BWEW0083, DATED 2/2012 OR AS UPDATED, AND KEPT ONSITE AT ALL TIMES.

TABLE 11.1 TOPSOIL REPLACEMENT SPECIFICATIONS

CUBIC YARDS OF TOPSOIL REQUIRED FOR APPLICATION TO VARIOUS DEPTHS

DEPTH (in)	PER 1,000 SQUARE FEET	PER ACRE
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806
7	21.7	940
8	24.8	1,074

TABLE 4.2 COMPOST FILTER SOCK STANDARDS

ORGANIC MATTER CONTENT	25%-100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5-8.5
MOISTURE CONTENT	30%-60%
PARTICLE SIZE	30%-50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 dS/M (MMHOS/CM) MAXIMUM

SEQUENCE OF CONSTRUCTION

THE RENOVATION AND RE-CONSTRUCTION OF THE EXISTING PANTHER HOLLOW POND WILL CONSIST OF ONE GENERAL PHASE OF CONSTRUCTION. ALL E&S CONTROL FACILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED E&S CONTROL PLAN AND THE PADEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL DATED MARCH 2012.

A GENERALIZED CONSTRUCTION SEQUENCE IS PROVIDED BELOW. EACH CONSTRUCTION SEQUENCE IS INTENDED TO PROVIDE A GENERAL COURSE OF ACTION IN ORDER TO CONFORM TO THE APPLICABLE REGULATORY AGENCY REQUIREMENTS FOR TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENT POLLUTION CONTROL. ALL NECESSARY PARTS FOR PROPER AND COMPLETE EXECUTION OF WORK PERTAINING TO THIS PLAN, WHETHER SPECIFICALLY MENTIONED OR NOT, ARE TO BE PERFORMED BY THE CONTRACTOR. IT IS NOT INTENDED THAT THE DRAWINGS AND THIS REPORT SHOW EVERY DETAILED PIECE OF MATERIAL OR EQUIPMENT. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS LISTED IN THIS SECTION. THE CONTRACTOR MAY BE REQUIRED TO ALTER CONTROLS BASED ON EFFECTIVENESS OF CONTROLS OR DIFFERING CONDITIONS ENCOUNTERED. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO MINIMIZE THE EXTENT AND DURATION OF EARTH DISTURBANCE ACTIVITY.

1. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES (INCLUDING CLEARING AND GRUBBING), THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, AND A REPRESENTATIVE FROM THE ALLEGHENY COUNTY CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
2. UPON INSTALLATION OR STABILIZATION OF ALL PERIMETER SEDIMENT BMPS AND AT LEAST 3 DAYS PRIOR TO PROCEEDING WITH THE BULK EARTH DISTURBANCE ACTIVITIES, THE PERMITTEE OR CO-PERMITTEE SHALL PROVIDE NOTIFICATION TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT.
3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM IN. SHALL BE NOTIFIED 1-800-242-1776 FOR THE LOCATION OF EXITING UNDERGROUND UTILITIES.
4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PRECEDE IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS, DEVIATION FROM THE SEQUENCE MUST BE APPROVED BY THE ALLEGHENY COUNTY CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION. EACH STEP OF THE SEQUENCE SHALL BE COMPLETED BEFORE PROCEEDING TO THE NEXT STEP, EXCEPT WHERE NOTED.
5. LAYOUT THE LIMITS OF THE CONSTRUCTION SITE AND ESTABLISH BENCHMARKS AND REFERENCE POINTS.
6. STAKE OUT THE LIMITS OF DISTURBANCE (6.1 ACRES) AS INDICATED ON THE CONSTRUCTION PLANS.
7. INSTALL THE ROCK CONSTRUCTION ENTRANCES (2) AS SHOWN ON THE PLAN AND IN ACCORDANCE WITH THE STANDARD DETAIL.
8. INSTALL ORANGE CONSTRUCTION FENCE AROUND AREAS OF PANTHER HOLLOW WHICH ARE NOT TO BE DISTURBED DURING CONSTRUCTION, AS SHOWN ON THE PLANS. ALSO CONSTRUCT ORANGE CONSTRUCTION FENCE AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.
9. INSTALL SILT SOCK, 1,2,3, IN THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL BEING CAREFUL NOT TO DISTURB THE EXISTING WOODLANDS THAT ARE OUTSIDE OF THE DELINEATED LIMITS OF DISTURBANCE. ALL COMPOST FILTER SOCK SHALL BE INSTALLED PARALLEL TO THE CONTOURS.
10. CLEARING, GRUBBING, AND EARTH WORK OPERATIONS WITHIN THE DRAINAGE AREAS TO THE PERIMETER CONTROLS MAY COMMENCE WHEN ALL PERIMETER CONTROLS ARE INSTALLED AND OPERATIONAL.
11. BEGIN CLEARING AND GRUBBING ACTIVITIES NEEDED TO RE-CONSTRUCT THE EXISTING PANTHER HOLLOW LAKE, TAKING CARE NOT TO WORK BEYOND THE PERMIT BOUNDARY SHOWN ON THE PLAN. PLACE STRIPPED TOPSOIL IN THE TOPSOIL STOCKPILE AREAS DESIGNATED ON THE PLAN AND/OR REMOVE FROM SITE. STOCKPILE LOCATIONS MAY VARY IN THE FIELD, AND ADDITIONAL STOCKPILE LOCATIONS MAY BE USED AS NECESSARY. ALL TOPSOIL STOCKPILE AREAS SHALL BE FULLY ENCLOSED WITH SILT SOCK AS PER THE STANDARD DETAIL. INSTALL THE CONCRETE WASHOUT FACILITY AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.
12. PERFORM CUT AND FILL OPERATIONS TO BRING THE PANTHER HOLLOW POND SITE TO THE PROPOSED FINAL SUBGRADE ELEVATIONS. UTILIZE ROCK FILL UNDERDRAINS, AS NECESSARY, TO CARRY THE IMPACTED EXISTING LAKE AND ANY ENCOUNTERED GROUNDWATER THROUGH THE PROPOSED GRADING. STABILIZE STAGING AREA AS SOON AS FINAL SUBGRADE ELEVATIONS ARE REACHED. RE-GRADE TO DESIGN GRADES AND UTILIZE A PUMP AND FILTER BAG TO DEWATER THE LAKE DURING CONSTRUCTION.
13. CONSTRUCT PERMANENT BERM ON THE WESTERN SIDE OF PANTHER HOLLOW LAKE WITH APPROPRIATE SPILLWAY AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.
14. BEGIN ROUGH GRADING ON SITE AND ALL FILL AREAS SHALL BE PLACED AND COMPACTED ACCORDING TO THE PROJECT EARTHWORK SPECIFICATIONS. CONSTRUCT FILL KEYS AND SUBSURFACE DRAINS AS SHOWN ON THE CONSTRUCTION DRAWINGS AND AS NECESSARY DURING EARTHWORK. PLACE TOPSOIL AND INSTALL EROSION CONTROL BLANKETS ON ALL SLOPES 3H:1V OR GREATER IN ACCORDANCE WITH THE STANDARD DETAIL. AT THE END OF EACH WORKING DAY NO MORE THAN 10 FEET OF SOIL SHALL BE EXPOSED WITHOUT BLANKET ON ANY PERMANENT SLOPES STEEPER THAN OR EQUAL TO 3H:1V. IMMEDIATE STABILIZATION IS REQUIRED UPON TEMPORARY CESSATION OF WORK, 4 OR MORE DAYS, OR AS SOON AS GRADED AREA REACHES FINAL GRADE.
15. AS FILL SLOPES GRADES ARE ACHIEVED BACK-CUT SLOPES TO DIVERT THE RUNOFF TO THE BMP'S SHOWN ON THE PLANS.
16. AS DISTURBED AREAS WITHIN A PROJECT APPROACH FINAL GRADE, PREPARATIONS SHOULD BE MADE FOR SEEDING AND MULCHING TO BEGIN. IN NO CASE SHOULD AN AREA EXCEEDING 15,000 SQUARE FEET WHICH IS TO BE STABILIZED BY VEGETATION, REACH FINAL GRADE WITHOUT BEING SEEDED OR MULCHED.
17. FINE GRADE AND STABILIZE ALL AREAS OF THE SITE. ALL UNPAVED DISTURBED AREAS SHALL BE STABILIZED IMMEDIATELY WITH SEED AND MULCH ONCE GRADING IS COMPLETE OR WITHIN FOUR (4) DAYS ONCE THE CONSTRUCTION HAS BEEN COMPLETED. INSTALL THE APPROPRIATE EROSION CONTROL BLANKETS FOR ALL SLOPES STEEPER THAN 3:1.
18. FILL SLOPES SHOULD BE SEEDED AND MULCHED AT REGULAR VERTICAL INCREMENTS – 15 TO 25 FEET MAXIMUM – AS FILL IS BEING CONSTRUCTED. THIS WILL ALLOW THE BOTTOM OF THE FILL TO PROGRESS TOWARD STABILIZATION WHILE WORK CONTINUES ON THE UPPER PORTION, MAKING STABILIZATION EASIER TO ACHIEVE AND PROVIDING SOME VEGETATIVE BUFFERING AT THE BOTTOM OF THE SLOPE.
19. NOTIFY THE LICENSED PROFESSIONAL OR THEIR DESIGNEE AT LEAST 2 DAYS PRIOR TO THE START OF THE OF THE STORMWATER MANAGEMENT SYSTEM CONSTRUCTION. THE LICENSED PROFESSIONAL OR THEIR DESIGNEE MUST BE PRESENT DURING THE LAKE RE-CONSTRUCTION.
20. ONCE THE SITE IS PERMANENTLY STABILIZED, REMOVE THE DEWATERING DEVICES AND THE COFFERDAMS. REFER TO STORMWATER MANAGEMENT PLAN FOR NOTES AND DETAILS.
21. WATER THAT IS BEING PUMPED FROM WORK AREAS MUST BE TREATED FOR SEDIMENT REMOVAL PRIOR TO DISCHARGING TO SURFACE WATERS UNLESS IT CAN BE SHOWN THAT THE QUALITY OF THE WATER BEING PUMPED ALREADY MEETS DISCHARGE STANDARDS. IF A PROPERLY FUNCTIONING SEDIMENT BASIN OR SEDIMENT TRAP IS AVAILABLE, THE PUMP DISCHARGE MAY BE ROUTED THROUGH THE TRAP OR BASIN.
22. ONCE A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ACHIEVED ON ALL DISTURBED AREAS BEGIN REMOVAL OF ALL REMAINING TEMPORARY CONTROL MEASURES. REMOVE FILTREXX SOCKS BY SLASHING OPEN AND SPREADING MULCH AND SEEDING. REMOVE THE REMAINDER OF TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES. DISPOSE OF ACCUMULATED SEDIMENT AT A PADEP-APPROVED FACILITY.

TOPSOIL REPLACEMENT SPECIFICATIONS

1. GRADED AREAS SHOULD BE SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES TO PERMIT BONDING OF THE TOPSOIL TO THE SURFACE AREAS AND TO PROVIDE A ROUGHENED SURFACE TO PREVENT TOPSOIL FROM SLIDING DOWN THE SLOP.
2. TOPSOIL SHOULD BE UNIFORMLY DISTRIBUTED ACROSS THE DISTURBED AREA TO A DEPTH OF 4 TO 8 INCHES MINIMUM, 2 INCHES ON FILL OUTSLOPES.
3. SPREADING SHOULD BE DONE THAT SODDING/SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL PREPARATION OR TILLAGE.
4. IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOIL PLACEMENT SHOULD BE CORRECTED IN ORDER TO PREVENT FORMATION OF DEPRESSIONS UNLESS SUCH DEPRESSIONS ARE PART OF THE PCSM PLAN.
5. TOPSOIL SHALL NOT BE PLACED IF TOPSOIL OR SUBSOIL IS FROZEN OR MUDDY, EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
6. COMPACTED SOILS SHOULD BE SCARIFIED 6 TO 12 INCHES ALONG CONTOUR WHEREVER POSSIBLE PRIOR TO SEEDING.

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

SciTek CONSULTANTS, INC.
1880 JOHN F. KENNEDY BLVD., SUITE 600
PHILADELPHIA, PA 19103
PHONE: (267) 341-5385 FAX: (267)519-0273
www.scitekanswers.com

CEC
Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

4MR

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: LJK/KPK	CHECKED BY: KPK	APPROVED BY: KPK	
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 18-840	
EROSION AND SEDIMENT CONTROL PLAN		DRAWING NO.: C903	

APPENDIX B-10

SPILLWAY STAGE – DISCHARGE TABLE

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
796.00	0.00	0.00	0.00
796.50	0.00	0.00	0.00
797.00	0.00	0.00	0.00
797.50	0.00	0.00	0.00
798.00	0.00	0.00	0.00
798.50	0.00	0.00	0.00
799.00	0.00	0.00	0.00
799.50	0.00	0.00	0.00
800.00	0.00	0.00	0.00
800.50	0.00	0.00	0.00
801.00	0.00	0.00	0.00
801.50	0.00	0.00	0.00
802.00	0.00	0.00	0.00
802.50	0.00	0.00	0.00
803.00	0.00	0.00	0.00
803.50	0.00	0.00	0.00
804.00	0.00	0.00	0.00
804.50	0.00	0.00	0.00
805.00	0.00	0.00	0.00
805.50	0.00	0.00	0.00
806.00	0.00	0.00	0.00
806.50	10.90	10.90	0.00
807.00	30.82	30.82	0.00
807.50	31.67	31.67	0.00
808.00	32.25	32.25	0.00
808.50	32.82	32.82	0.00
809.00	33.38	33.38	0.00
809.50	33.94	33.94	0.00
810.00	34.48	34.48	0.00
810.50	35.01	35.01	0.00
811.00	35.54	35.54	0.00
811.50	36.06	36.06	0.00
812.00	36.57	36.57	0.00
812.50	61.34	37.07	24.27
813.00	109.36	37.57	71.79
813.50	175.72	38.06	137.66
814.00	259.38	38.55	220.83
814.50	716.71	39.03	677.68
815.00	1,486.57	39.50	1,447.07
815.50	2,466.06	39.97	2,426.09
816.00	3,618.68	40.43	3,578.25
816.50	4,923.49	40.89	4,882.61
817.00	6,366.52	41.34	6,325.18
817.50	7,937.60	41.79	7,895.81
818.00	9,628.96	42.23	9,586.74
818.50	11,434.43	42.67	11,391.77
819.00	13,348.97	43.10	13,305.87
819.50	15,368.38	43.53	15,324.85
820.00	**17,489.10**	**43.95**	**17,445.15**

APPENDIX B-11

DAM BREACH DRAWDOWN ANALYSIS CALCULATIONS

F_c = Reservoir Compaction Factor
H = Breach Height (feet)
L = Reservoir Length (feet)

$$F_c = {}^{H}/_{L}$$

F_t = Reservoir Translation Factor
c = Wave Celerity = $(gD)^{0.5}$
g = 32.2 ft/s^2
$D = H/2$
t = Failure Time (seconds)
L = Reservoir Length (feet)

$$F_t = {}^{ct}/_{L}$$

D_n = Drawdown Number

$$D_n = F_c \times F_t$$

$D_n < 0.24$, use dynamic routing for breach
$D_n > 0.41$, use level-pool routing for breach
$D_n > 0.24$ and $D_n < 0.41$, use engineering judgement to determine breach routing method

Pittsburgh Water & Sewer Authority, Four Mile Run Stormwater Improvement Project

F_c = Reservoir Compaction Factor
H = 12 feet
L = 580 feet

F_c = 6/530 = **0.02069**

F_t = Reservoir Translation Factor
c = Wave Celerity = $(gD)^{0.5}$
g = 32.2 ft/s^2
$D = H/2$
$c = (32.2*6)^{0.5} = 13.90$
t = 1800
L = 580

F_t = (13.90*1800)/580 = **43.14**

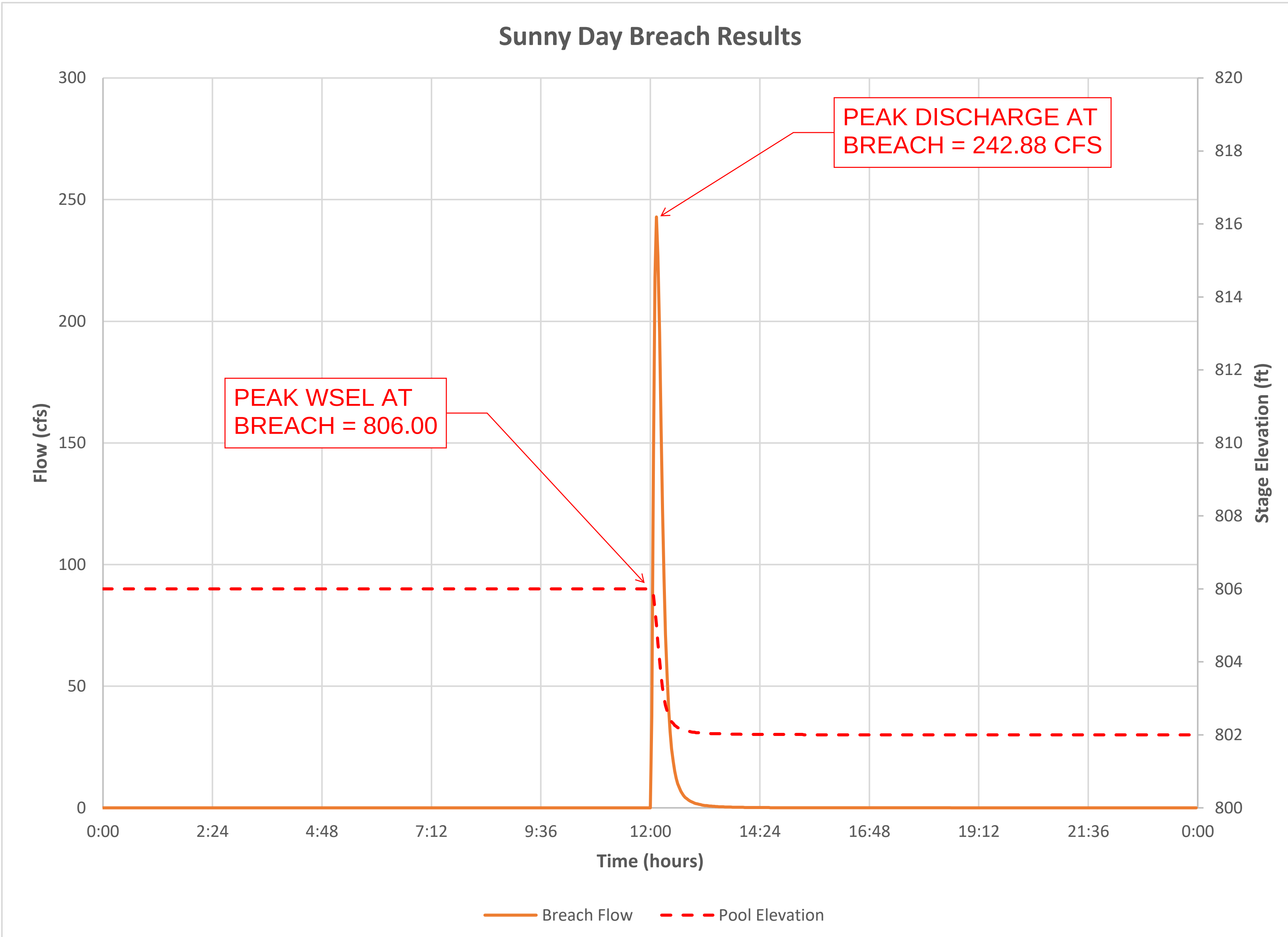
D_n = Drawdown Number
D_n = 0.02069*43.14 = **0.892**

Per engineering judgement, level-pool routing will be used for Four Mile Run

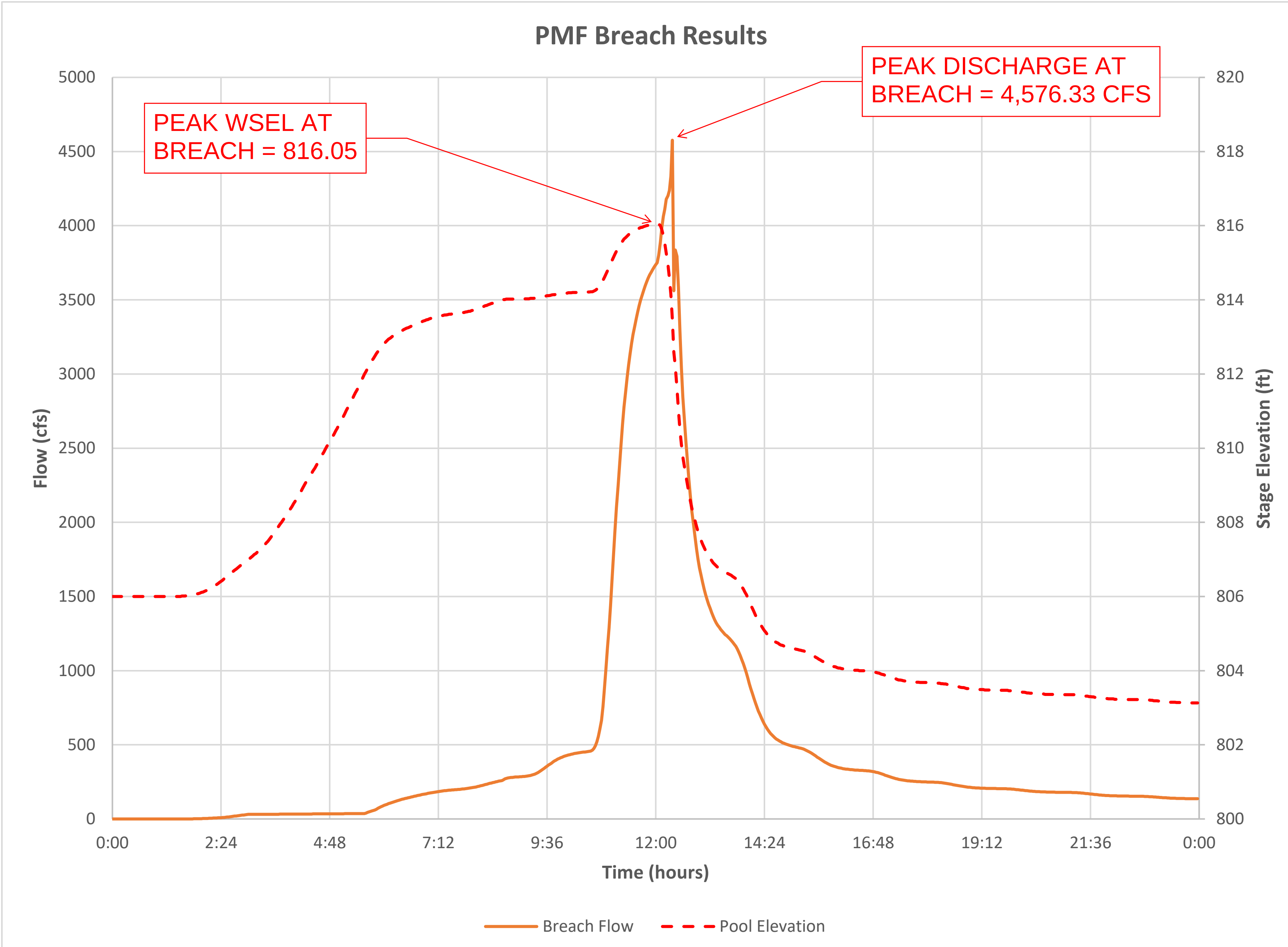
Reference: Goodell, C.R.; Wahlin, B. 2009. "Dynamic and Level Pool Reservoir Drawdown – A Practical Comparison for Dam Breach Modeling." 2009 IAHR Congress Proceedings, Vancouver BC, Canada.

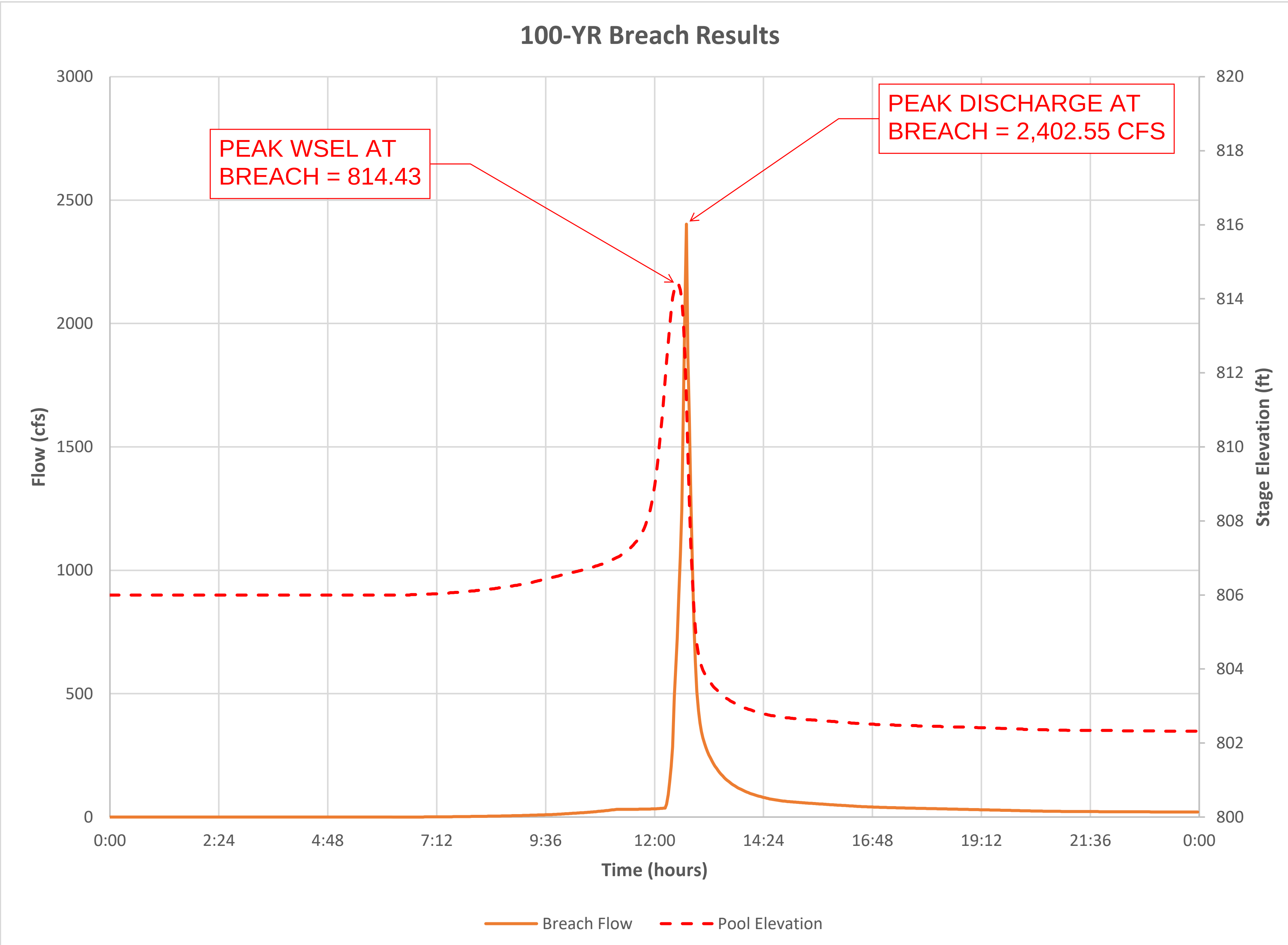
APPENDIX B-12

HEC-HMS DAM BREACH RESULTS

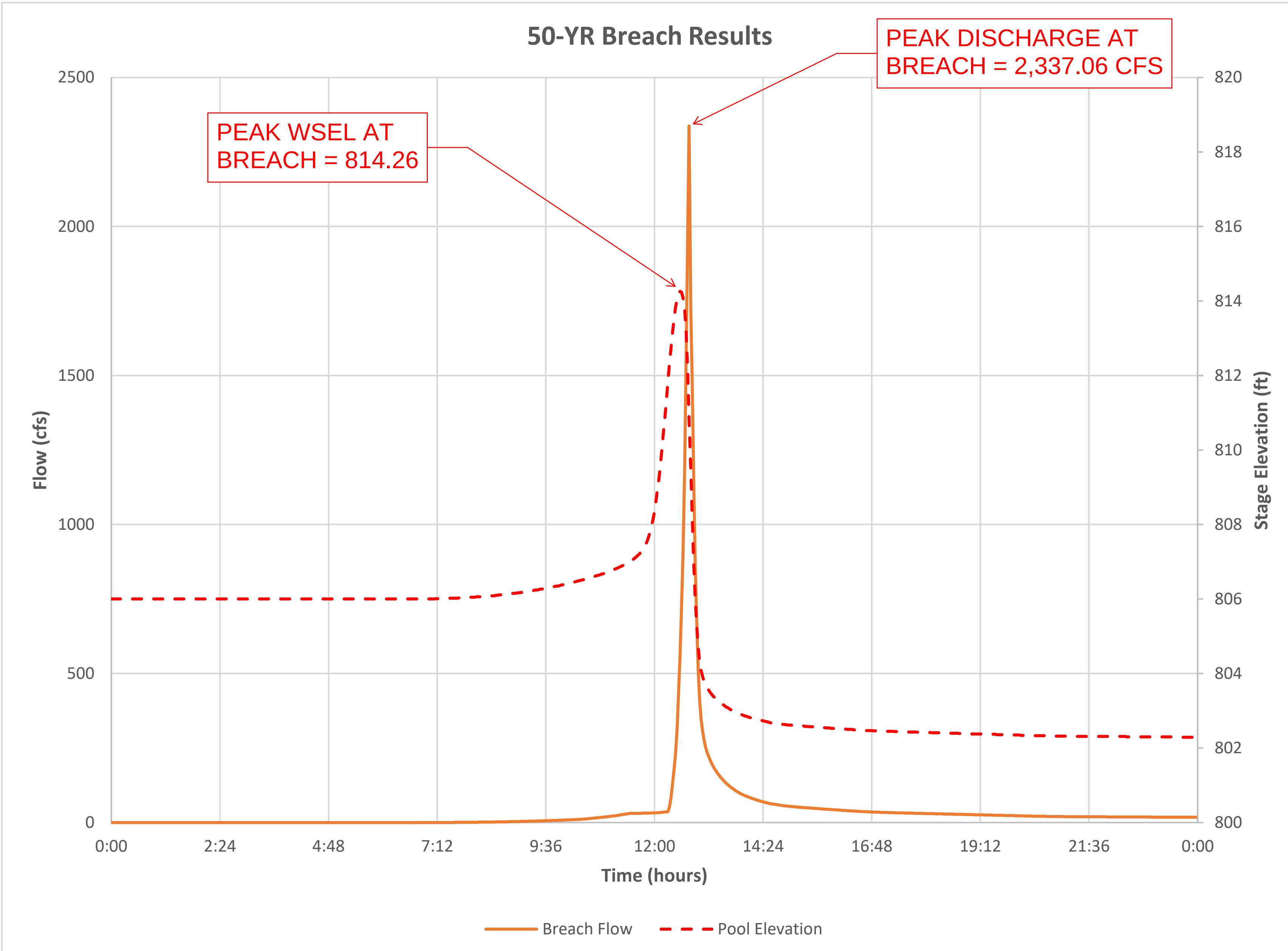


Sunny Day Breach Results
PEAK DISCHARGE AT BREACH = 242.88 CFS
PEAK WSEL AT BREACH = 806.00
Flow (cfs)
Stage Elevation (ft)
Time (hours)
300
250
200
150
100
50
0
820
818
816
814
812
810
808
806
804
802
800
0:00
2:24
4:48
7:12
9:36
12:00
14:24
16:48
19:12
21:36
0:00
Breach Flow
Pool Elevation


PMF Breach Results
PEAK WSEL AT
BREACH = 816.05
PEAK DISCHARGE AT
BREACH = 4,576.33 CFS
Flow (cfs)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Stage Elevation (ft)
820
818
816
814
812
810
808
806
804
802
800
0:00
2:24
4:48
7:12
9:36
12:00
14:24
16:48
19:12
21:36
0:00
Time (hours)
Breach Flow
Pool Elevation



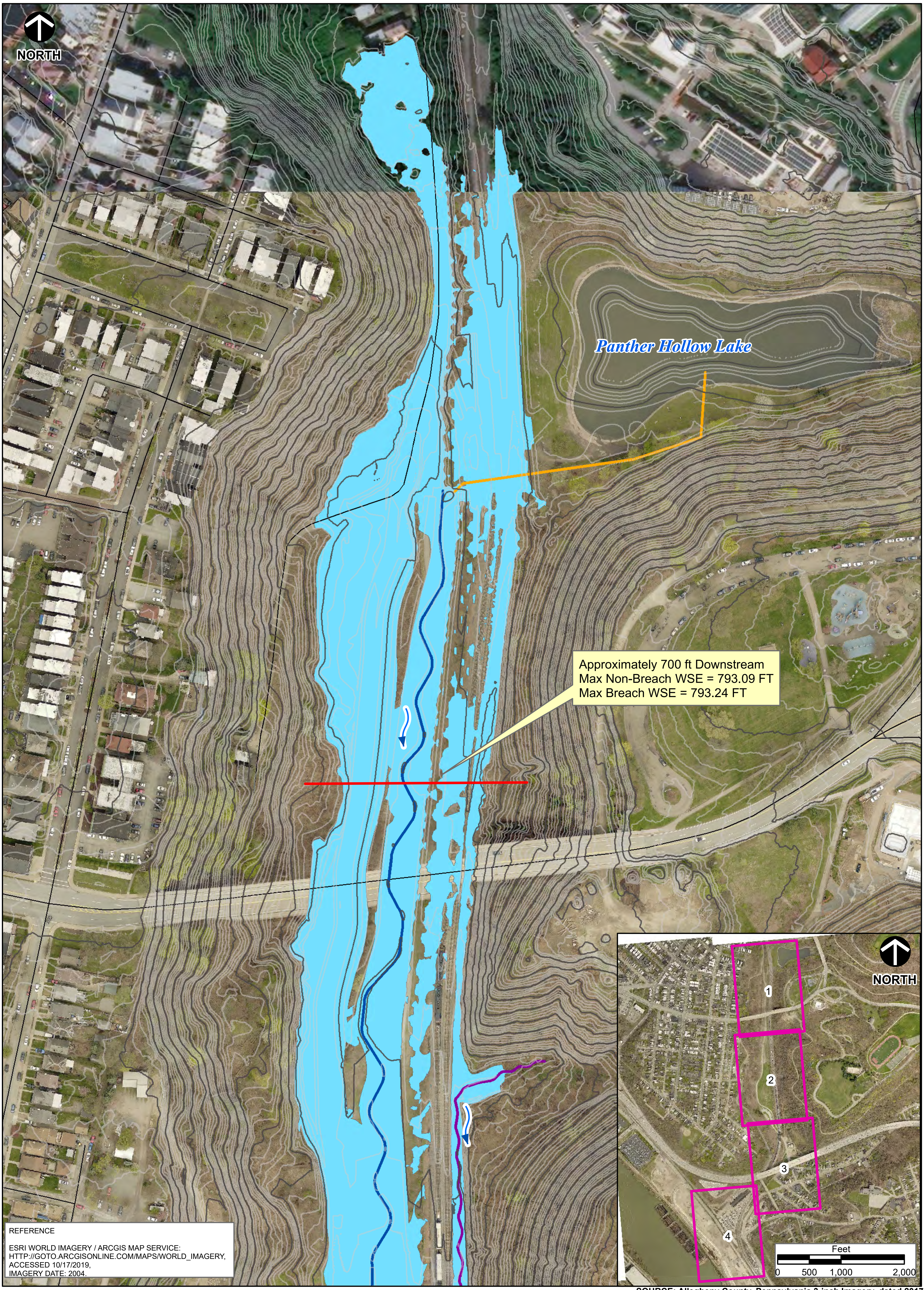
100-YR Breach Results
PEAK WSEL AT BREACH = 814.43
PEAK DISCHARGE AT BREACH = 2,402.55 CFS
Flow (cfs)
3000
2500
2000
1500
1000
500
0
Stage Elevation (ft)
820
818
816
814
812
810
808
806
804
802
800
0:00
2:24
4:48
7:12
9:36
12:00
14:24
16:48
19:12
21:36
0:00
Time (hours)
Breach Flow
Pool Elevation



50-YR Breach Results
PEAK DISCHARGE AT BREACH = 2,337.06 CFS
PEAK WSEL AT BREACH = 814.26
Flow (cfs)
2500
2000
1500
1000
500
0
Stage Elevation (ft)
820
818
816
814
812
810
808
806
804
802
800
0:00
2:24
4:48
7:12
9:36
12:00
14:24
16:48
19:12
21:36
0:00
Time (hours)
Breach Flow
Pool Elevation

APPENDIX B-13

INUNDATION MAPS



SOURCE: Allegheny County, Pennsylvania 3-inch Imagery, dated 2017

Legend

- ProfileLines
- Major Contours
- Minor Contours
- Stream Centerline
- Tributary Centerline
- Proposed Culvert Centerline
- Proposed Primary Culvert Centerline
- Street Centerlines
- 100-Year Inundation Boundary

0 75 150 Feet

NOTE:
- INUNDATION SHOWN IS FOR SUBJECT FLOODING SOURCE ONLY, IT DOES NOT NECESSARILY IDENTIFY ALL THE AREAS SUBJECT TO FLOODING, PARTICULARLY FROM LOCAL DRAINAGE SOURCES OF SMALL SIZE. THE COMMUNITY MAP REPOSITORY SHOULD BE CONSULTED FOR ADDITIONAL FLOOD HAZARD INFORMATION.

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PITTSBURGH, ALLEGHENY COUNTY, PA

100-YEAR INUNDATION MAP PROPOSED CONDITIONS

DRAWN BY: JTM	CHECKED BY: JS	APPROVED BY: PJS	PANEL NO: 1 of 4
DATE: OCT 17, 2019	SCALE: 1 " = 150 '	PROJECT NO: 174-960	

Signature on File *

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Legend

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0 75 150 Feet

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100-YEAR INUNDATION MAP
PROPOSED CONDITIONS

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DATE: OCT 17, 2019	SCALE: 1 " = 150 '	PROJECT NO: 174-960	2 of 4

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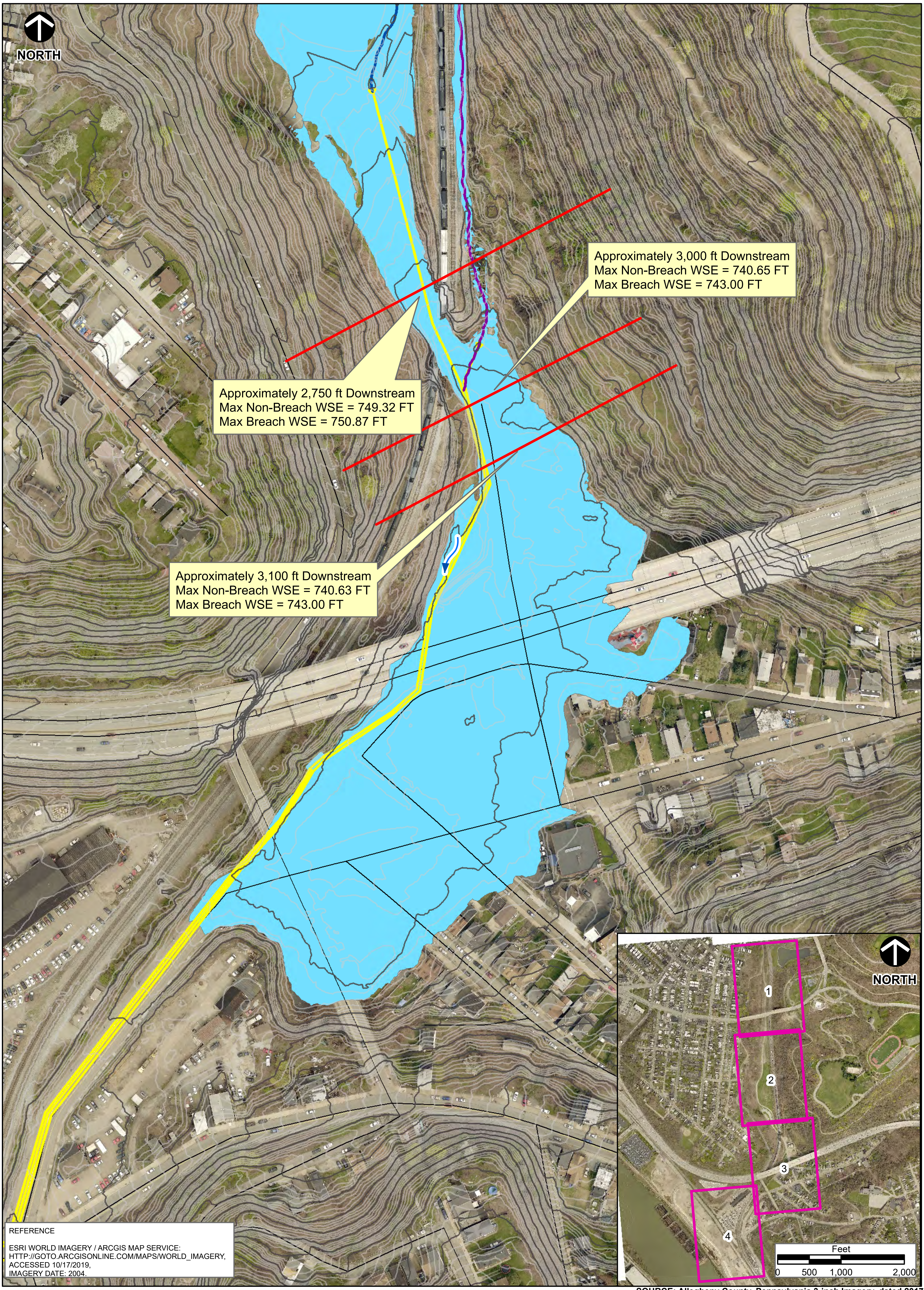

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0 75 150 Feet

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100-YEAR INUNDATION MAP
PROPOSED CONDITIONS

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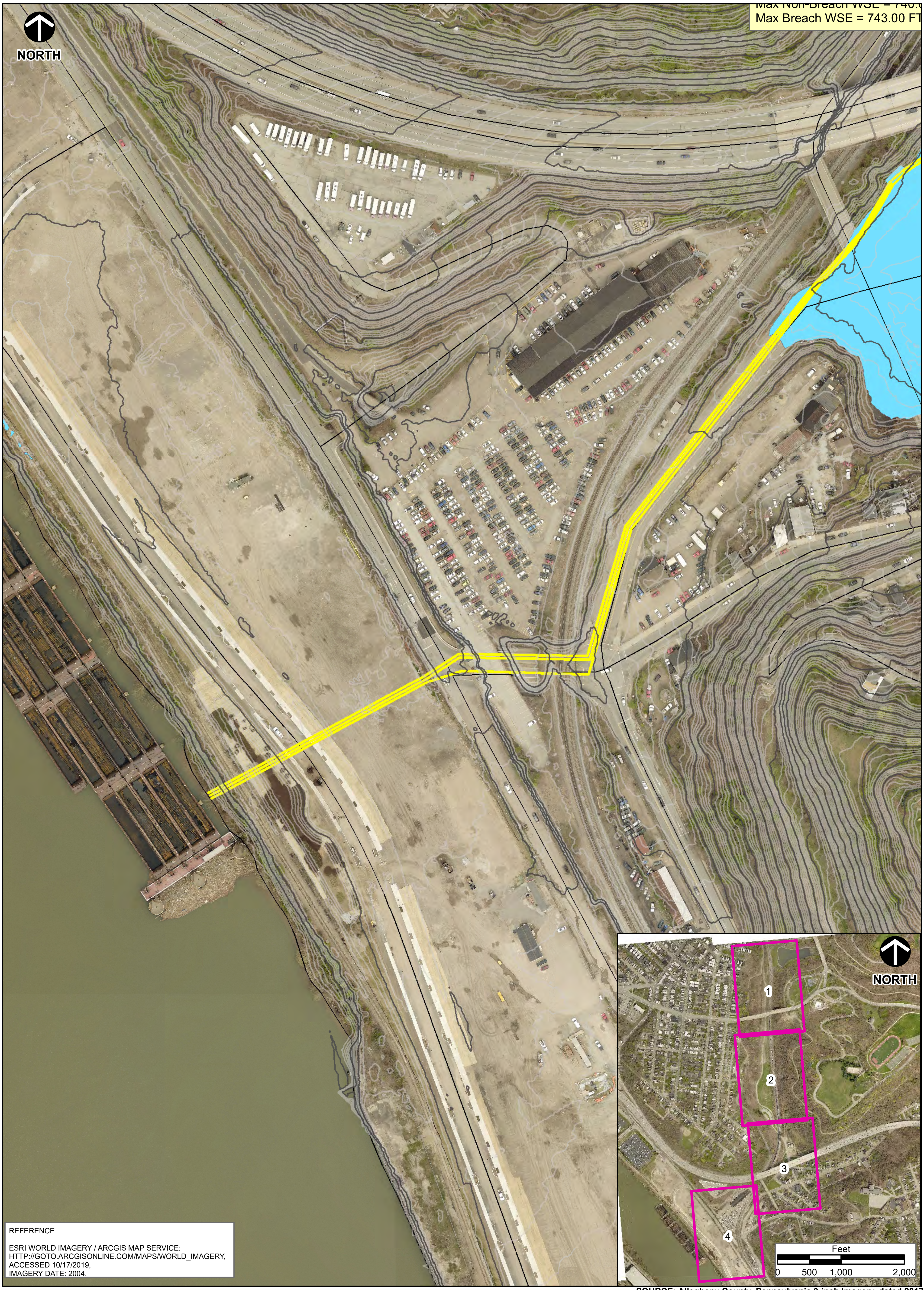
DATE: OCT 17, 2019	SCALE: 1 " = 150 '	PROJECT NO: 174-960	

Signature on File *



SOURCE: Allegheny County, Pennsylvania 3-inch Imagery, dated 2017

Legend

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0 75 150 Feet

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100-YEAR INUNDATION MAP
PROPOSED CONDITIONS

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DATE: OCT 17, 2019	SCALE: 1 " = 150 '	PROJECT NO: 174-960	4 of 4

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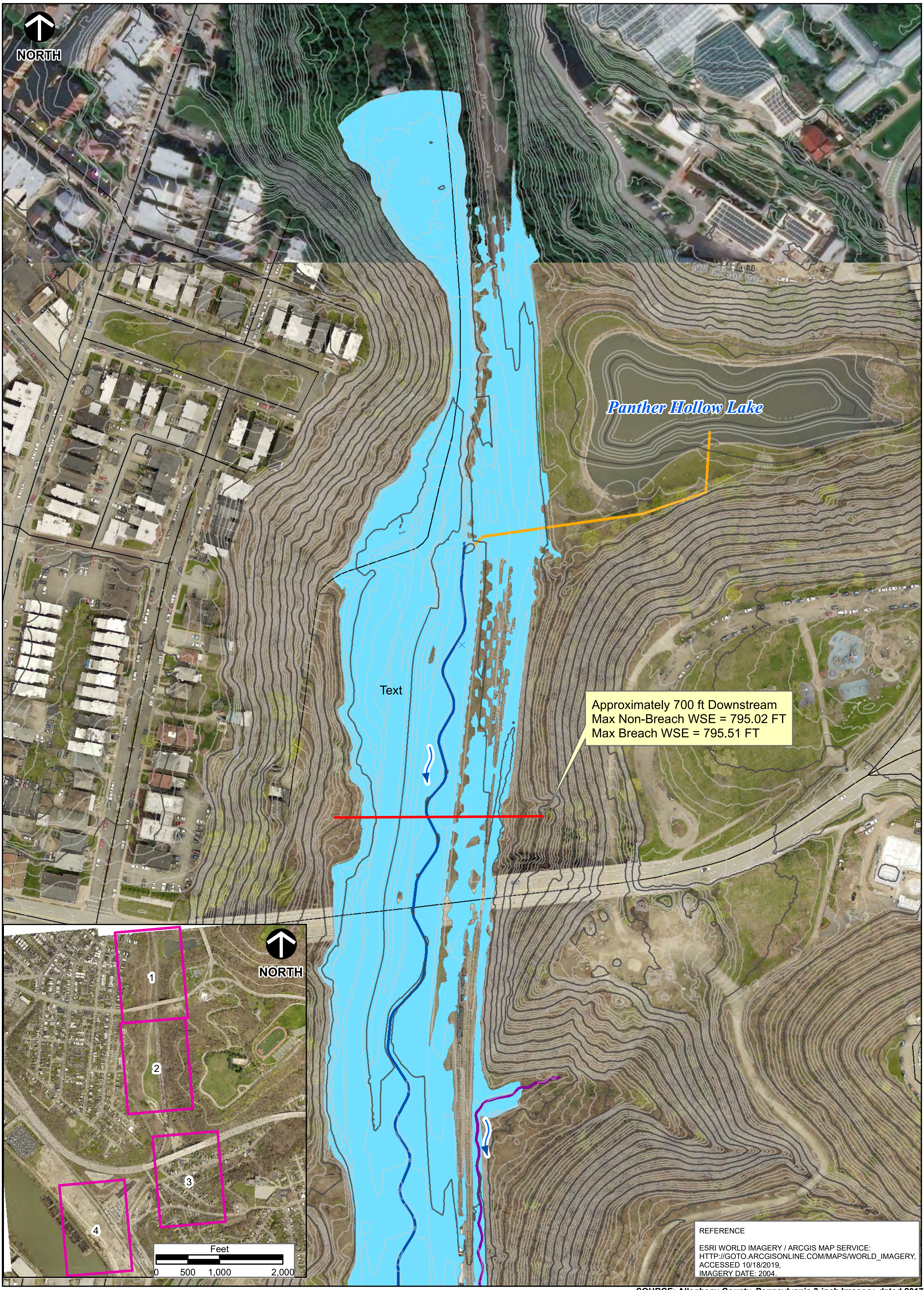

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Legend

- ProfileLines
- Major Contours
- Minor Contours
- Stream Centerline
- Tributary Centerline
- Proposed Culvert Centerline
- Proposed Primary Culvert Centerline
- Street Centerlines
- PMF Inundation Boundary

0 80 160 Feet

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PMF INUNDATION MAP
PROPOSED CONDITIONS

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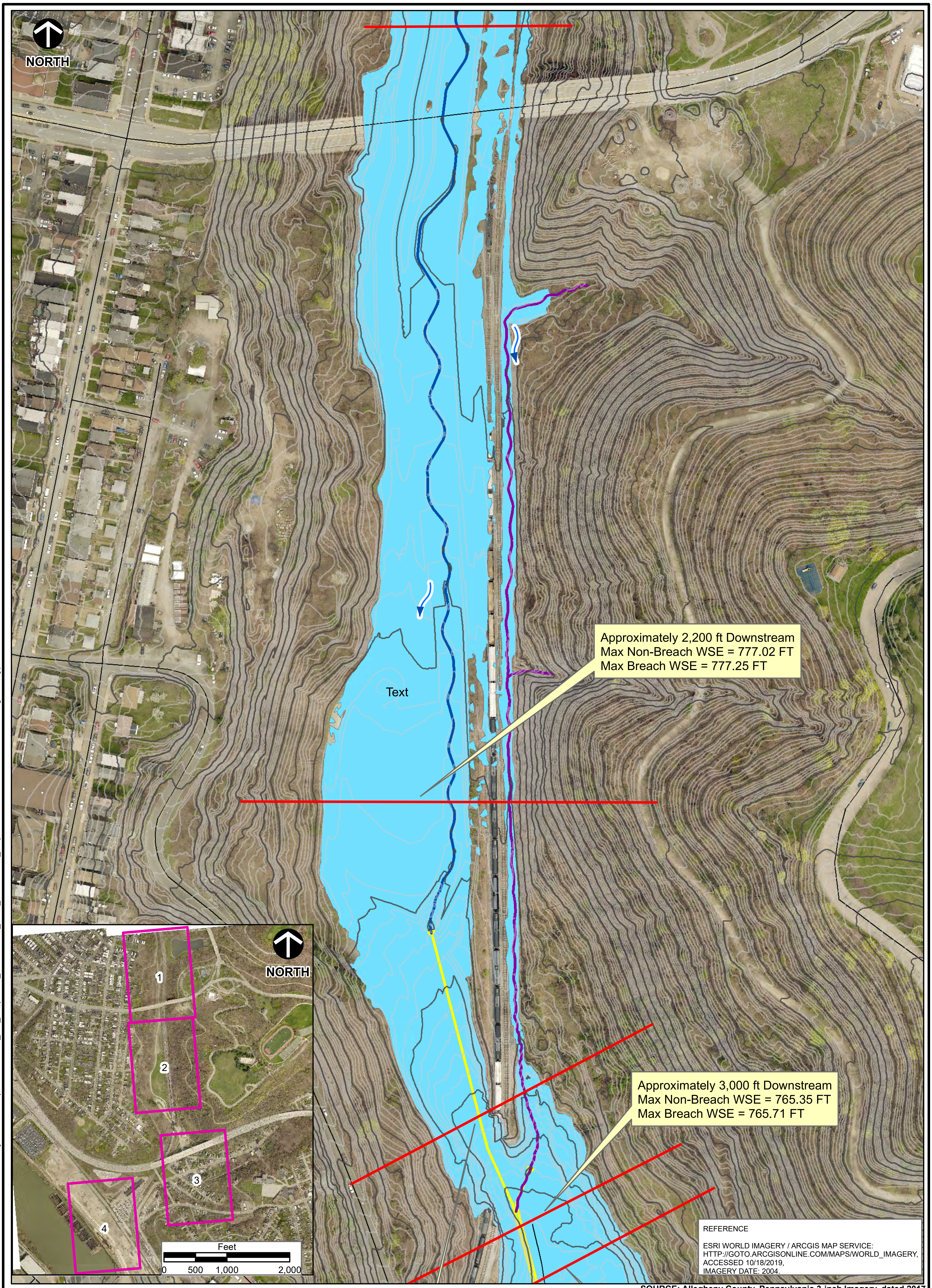
DATE: OCT 18, 2019	SCALE: 1 " = 160 '	PROJECT NO: 174-960	

Signature on File *



SOURCE: Allegheny County, Pennsylvania 3-inch Imagery, dated 2017

Legend

- ProfileLines
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0 80 160 Feet

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PMF INUNDATION MAP
PROPOSED CONDITIONS

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DATE: OCT 18, 2019	SCALE: 1 " = 160 '	PROJECT NO: 174-960	

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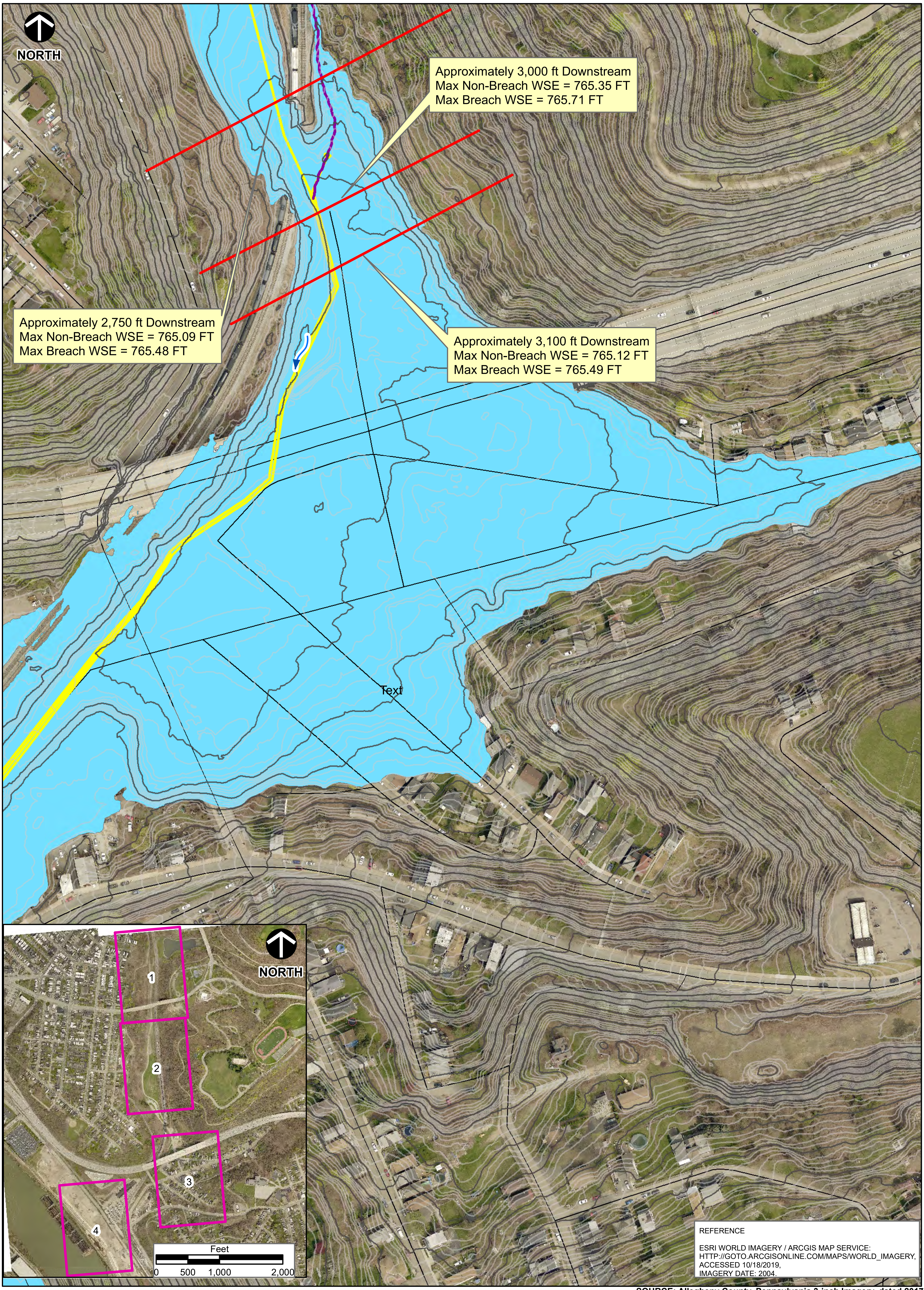

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Legend

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0 80 160 Feet

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PMF INUNDATION MAP
PROPOSED CONDITIONS

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DATE: OCT 18, 2019	SCALE: 1 " = 160 '	PROJECT NO: 174-960	

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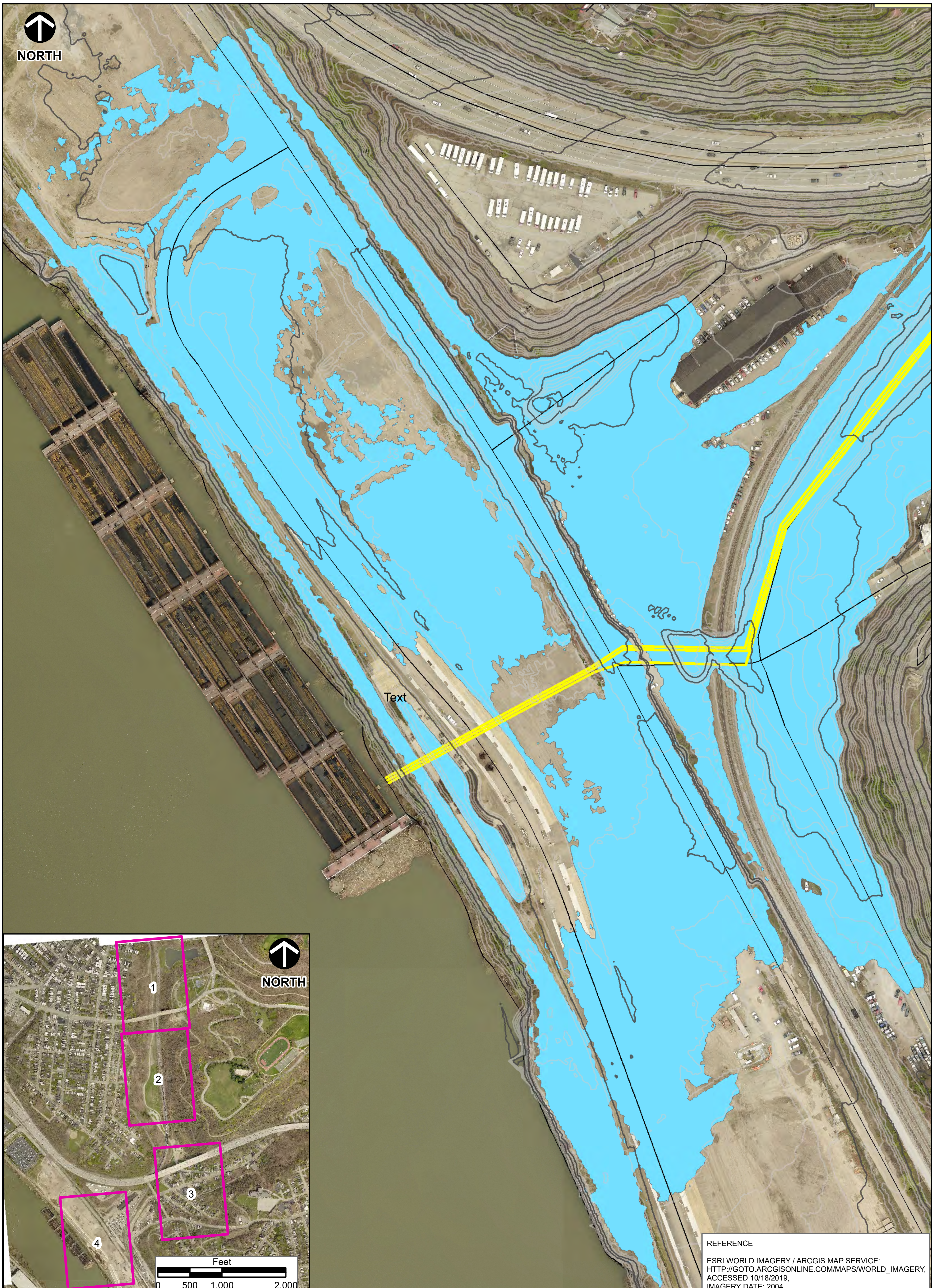

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Legend

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PMF INUNDATION MAP
PROPOSED CONDITIONS

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DATE: OCT 18, 2019	SCALE: 1 " = 160 '	PROJECT NO: 174-960		

Signature on File *

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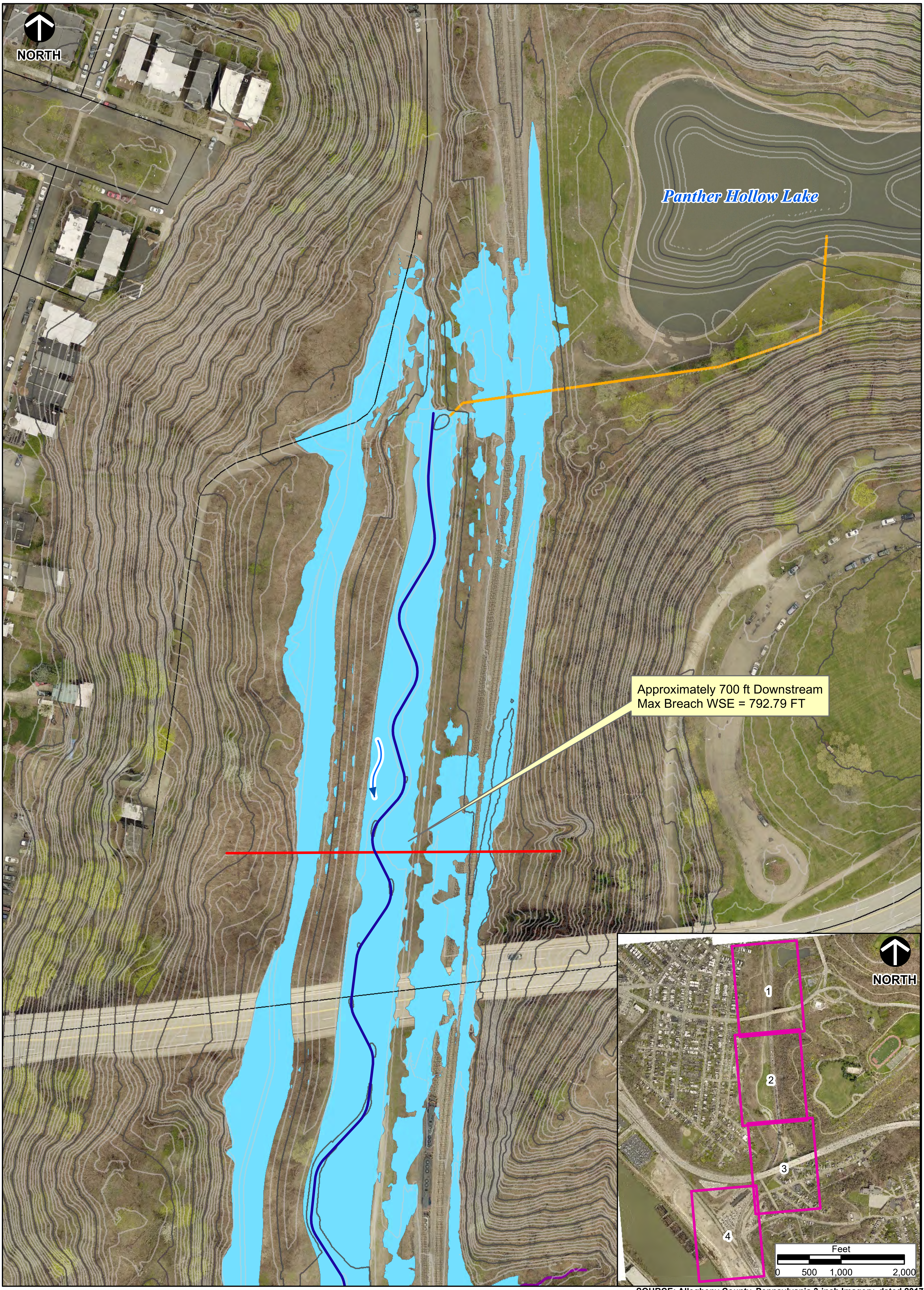

SOURCE: Allegheny County, Pennsylvania 3-inch Imagery, dated 2017

Legend

- ProfileLines
- Major Contours
- Minor Contours
- Stream Centerline
- Tributary Centerline
- Proposed Culvert Centerline
- Proposed Primary Culvert Centerline
- Street Centerlines
- Sunny Day Inundation Boundary

0 50 100
Feet

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SUNNY DAY INUNDATION MAP
PROPOSED CONDITIONS

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DATE: OCT 18, 2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960	1 of 4

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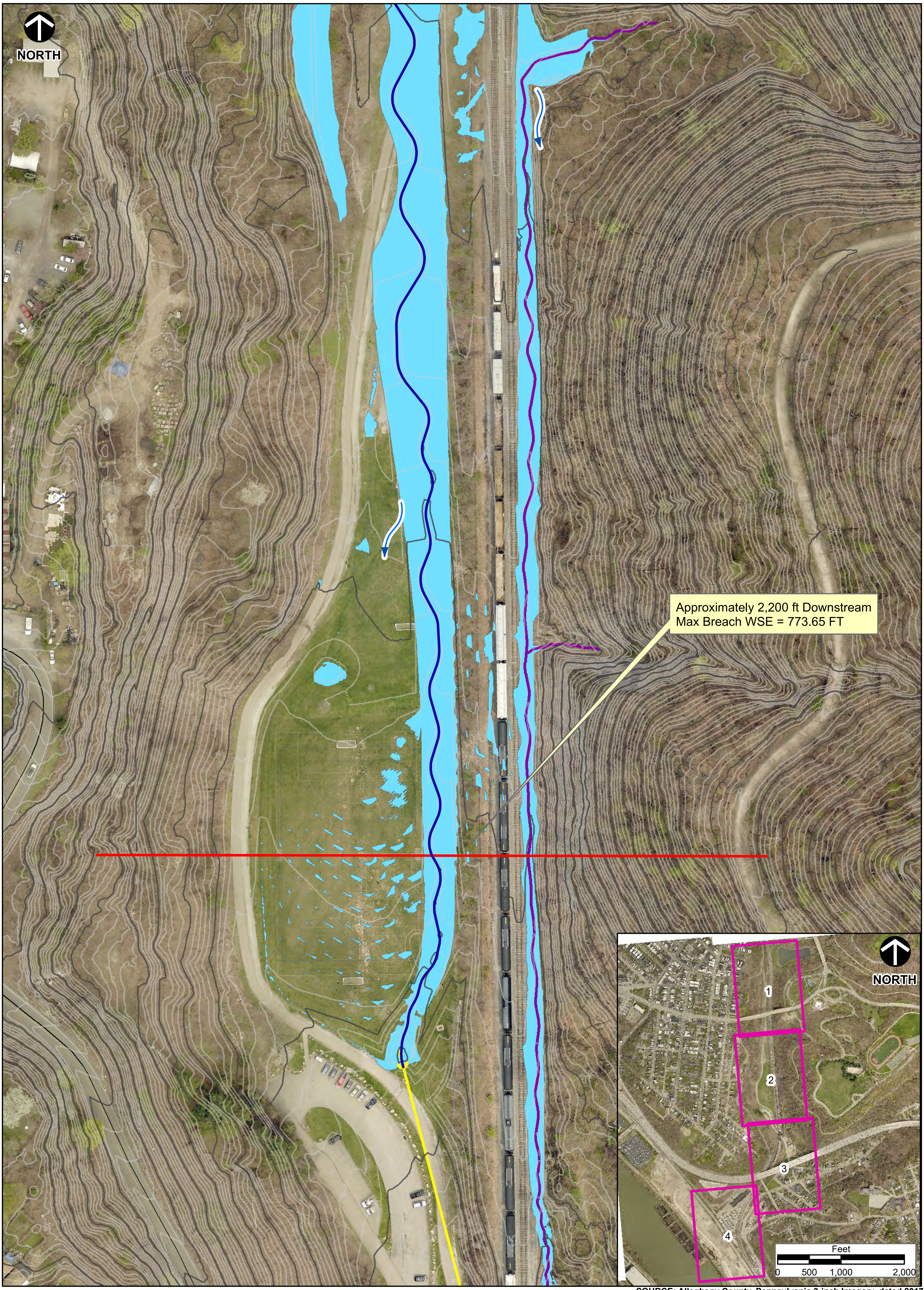

SOURCE: Allegheny County, Pennsylvania 3-inch Imagery, dated 2017

Legend

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0 50 100
Feet

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SUNNY DAY INUNDATION MAP
PROPOSED CONDITIONS

DRAWN BY: JTM	CHECKED BY: JS	APPROVED BY: PJS	PANEL NO:
DATE: OCT 18, 2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960	**2 of 4**

Signature on File *

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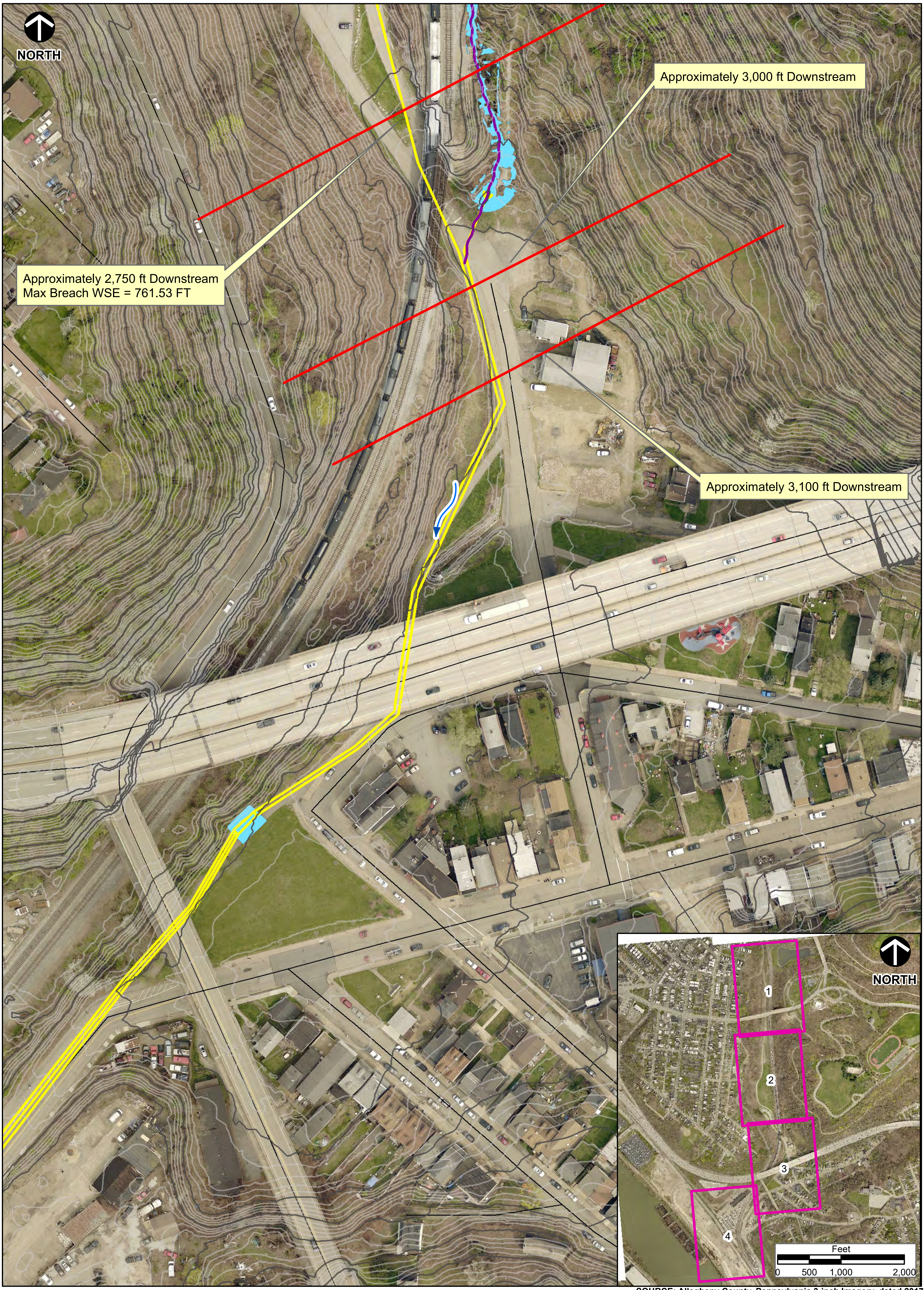

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Legend

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0 50 100 Feet

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SUNNY DAY INUNDATION MAP
PROPOSED CONDITIONS

DRAWN BY: JTM	CHECKED BY: JS	APPROVED BY: PJS	PANEL NO: 3 of 4
DATE: OCT 18, 2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960	

Signature on File *

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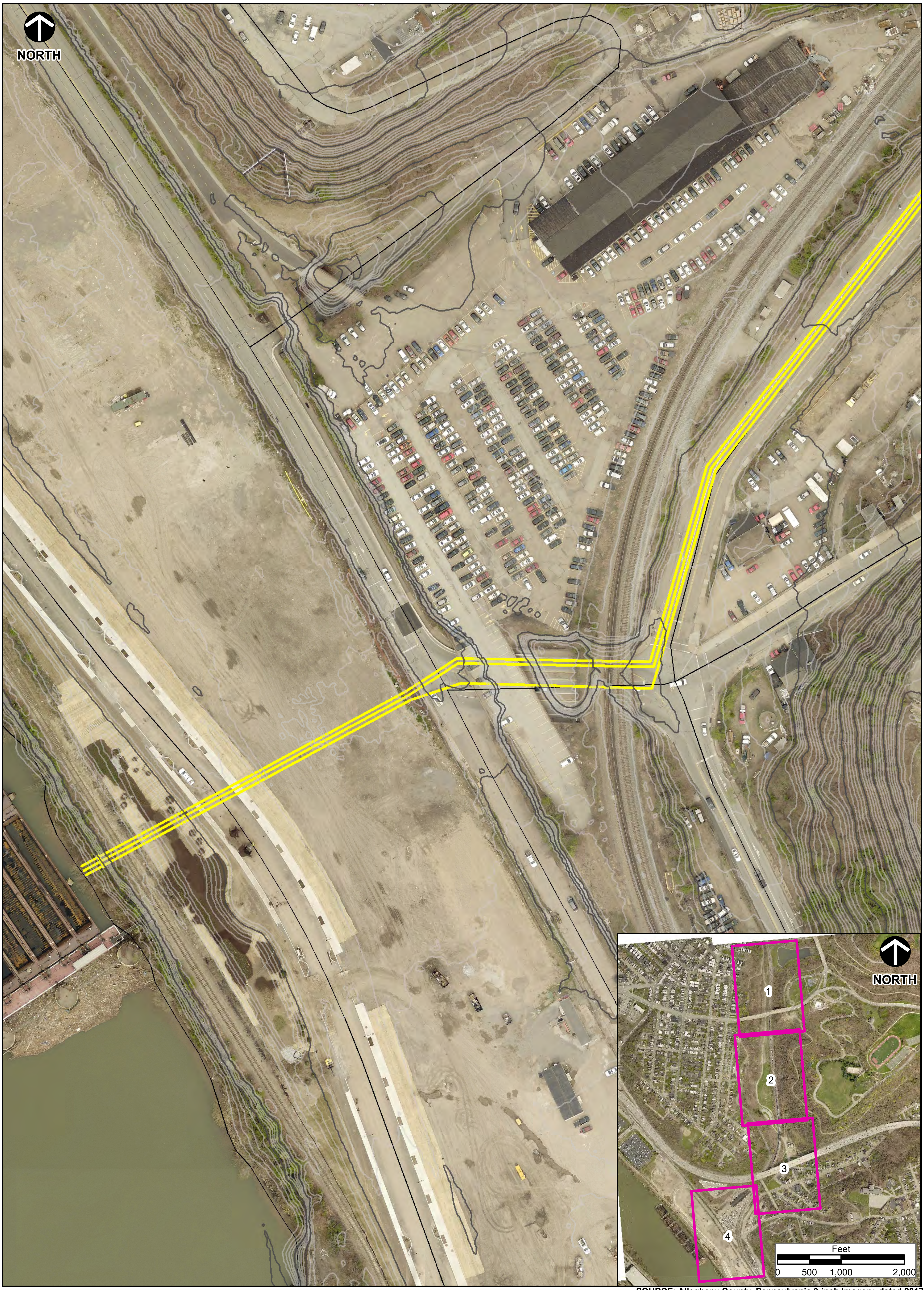

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SUNNY DAY INUNDATION MAP
PROPOSED CONDITIONS

DRAWN BY: JTM	CHECKED BY: JS	APPROVED BY: PJS	PANEL NO: **4 of 4**
DATE: OCT 18, 2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960	

Signature on File *

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APPENDIX E

CALCULATION BRIEF (SECTION 6.7.5)

PANTHER HOLLOW LAKE INFLOW HYDROLOGY, HYDROGRAPH ROUTING, PRINCIPAL SPILLWAY DESIGN

Technical Memo

Project:	CEC 4 Mile Run GSI Design for PWSA		
Our reference:	399786	**Your reference:**	
Prepared by:	Brian Moore	**Date:**	October 21, 2019
Approved by:	Kathy Chavara	**Checked by:**	Tom Batroney
Subject:	Model Narrative and Results in Support of Dam Permit Application		

1 Introduction

This document details a modeling investigation of Panther Hollow Lake within Schenley Park in the City of Pittsburgh, Pennsylvania. Schenley Park is a large, urban park (approximately 440 acres) within the City of Pittsburgh. It is completely contained within the boundary of the 2,400 acres that are tributary to the M-29 diversion structure as part of Pittsburgh Water and Sewer Authority's (PWSA's) combined sewer collection system. As part of the development of the Four Mile Run (4MR) Project to reduce the volume of stormwater entering the combined sewer system, the existing M-29 sewershed collection system model was updated and is referred to as the updated 4MR collection system model throughout this document. A primary development focus of the updated 4MR collection system model was adding details of the Schenley Park area not included in the existing M-29 collection system model. The current (October 2019) updates to the model included detailed watershed delineations, adding existing open channel streams, and adding Panther Hollow Lake.

2 Background

The updated 4MR collection system model was developed with the PC-SWMM 7.2 collection system software using the SWMM 5.1.12 computational engine. The model was simulated under design storm rainfall conditions that were created based on the following:

- Rainfall volumes were obtained from National Oceanic and Atmospheric Administration (NOAA) Atlas 14 document. This data was obtained in 2019 through NOAA's National Weather Service website (https://hdsc.nws.noaa.gov/hdsc/pfds/).
- Temporal rainfall distributions were National Resources Conservation Service (NRCS) Type 2.
- The model was simulated for a seven-day period with the design storm placed at the middle of that period to allow for both the increasing and decreasing flow response into Panther Hollow Lake without truncation.

Approximately 160 acres within Schenley Park are tributary to Panther Hollow Lake. The tributary area is primarily pervious land cover broken up into woodland areas, occurring generally on steeper slopes adjacent to the two primary existing streams (Panther Hollow Run and Phipps Run), and well-maintained grass areas with more moderate slopes associated with the Bob O'Connor Golf Course. The pervious areas have variable infiltration capacity but were modeled with relatively low infiltration capacity due to the generally steep terrain, the occurrence of perched water tables (Pittsburgh Regional Parks Natural Areas Study, June 2010) and to provide the best match to the flow meter data collected in the discharge pipe of the existing Panther Hollow Run Lake. The tributary impervious areas are mostly paved roadways that pass through the Park.

The speed of stormwater runoff is controlled by the “subcatchment width” parameter which is used to estimate the longest flow path length in each watershed within the model. The subcatchment width parameter is typically used as a model calibration parameter used to adjust the timing of the peak runoff response (i.e. time of concentration) to best match measured flow meter data while also remaining physically realistic.

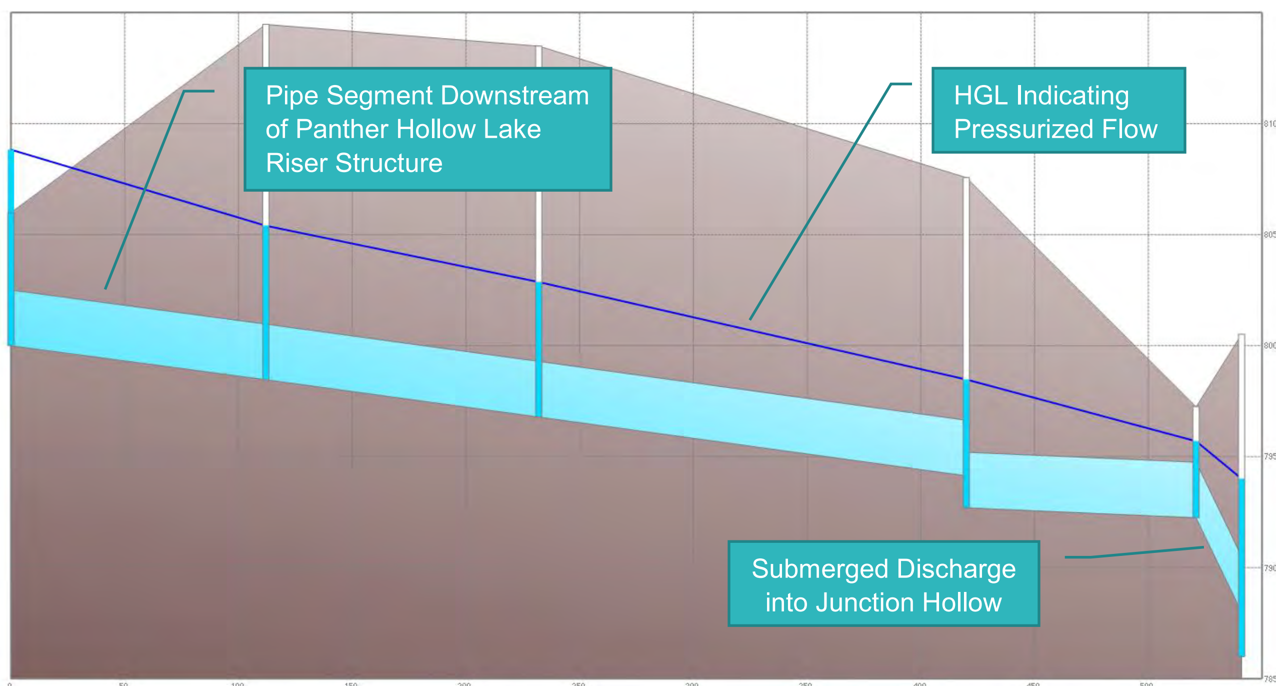
3 Project Details

Figure 1 details the primary elements of the 4MR project located in the vicinity of Panther Hollow Lake. Currently, upstream stormwater runoff is conveyed to Panther Hollow Lake through the Phipps Run and Panther Hollow Run open channel streams which is then discharged from the lake into an adjacent combined sewer pipe. The proposed 4MR Project will include a new riser pipe in Panther Hollow Lake conveying flow beneath adjacent railroad tracks to a proposed open channel along Junction Hollow. An emergency spillway will convey flow from Panther Hollow Lake to a ditch running parallel to Junction Hollow open channel on the other side of railroad tracks (referred to as the “Railroad Ditch”). Flows from both the Junction Hollow open channel and the Railroad Ditch will be conveyed to new pipe infrastructure which will ultimately discharge the stormwater flows into the Monongahela River. A more detailed description of the primary project elements is included following Figure 1.

Figure 1: Modeled representation of proposed project elements, not to scale

- **Phipps Run and Panther Hollow Run Open Channels** – Surveyed cross sections of both open channels were added to the updated 4MR collection system model and elevation of the stone walkway bridge structures located along the streams were incorporated to capture potential backwater effects.
- **Panther Hollow Lake Forebay** - The Forebay structure is surrounded by an adjacent wetland area. These elements are located at the confluence of Phipps Run and Panther Hollow Run. The Forebay is intended to capture sediment before it enters Panther Hollow Lake and is represented in the model as a storage node with a stage/storage relationship.
- **Earthen Berm between Forebay and Panther Hollow Lake** – This earthen berm between the Forebay and Panther Hollow Lake is overtopped as flow leaves the Forebay and enters Panther Hollow Lake. This element is represented in the model as a weir.
- **Panther Hollow Lake** – The existing Panther Hollow Lake has been modified in the proposed alternative to be deeper with a lower invert and a higher berm to significantly increase its storage volume.
- **Discharge from Panther Hollow Lake (Underflow)** – The proposed riser structure has a modeled elevation of 806 feet (NAVD 1988) which conveys flow from Panther Hollow Lake through a 30-inch diameter underflow pipe which connects the Lake to the proposed Junction Hollow open channel. The 30-inch diameter size was determined through an iterative process in the model to ensure that the discharging flow was high enough to keep the Panther Hollow Lake water surface elevation below the activation level of the emergency spillway. This 30-inch underflow pipe operates under pressure flow conditions as both inlet and outlet of the pipe are submerged. Figure 2 shows the maximum hydraulic grade line (HGL) profile of the 30-inch pipe during the 100-year design storm.

Figure 2: 30-Inch diameter underflow pipe maximum HGL for 100-yr, 24-hr design storm



- **Discharge from Panther Hollow Lake (Emergency Spillway)** – A proposed emergency spillway is modeled at elevation 813 feet (NAVD 1988) to maintain one foot of freeboard from the top of the Panther Hollow Lake embankment which has a crest elevation of 814 feet (NAVD 1988). The emergency spillway, if activated, discharges to the Railroad Ditch.
- **Downstream Connections to Discharge** – Flows to both the Junction Hollow and Railroad Ditch open channels are conveyed downstream to separate proposed 36-inch diameter pipes that convey the flow to ultimate discharge into the Monongahela River.

4 Evaluation criteria

The updated 4MR model incorporating the proposed infrastructure detailed above was simulated under six different 24-hour design storms up to, and including, the 100-year storm event. Shorter duration (1-hour) design storms were also simulated to determine which condition produced the highest peak flow and peak depths in the model. The model results with the greater peak flows and greater peak depths occurred during the 24-hour duration storm events; thus, the 24-hour duration design storm results are included in this document.

The proposed 4MR project alternative meets the following criteria under the 100-year, 24-hour design storm conditions:

- No flow can be “lost” from the model due to flooding of the Phipps Run/Panther Hollow Run open channels or the Forebay. All upstream stormwater runoff needs to be conveyed downstream through Panther Hollow Lake and into the downstream underflow pipe.
- The proposed emergency spillway at Panther Hollow Run Lake could not activate during the 100-year, 24-hour design storm. Specifically, discharge from Panther Hollow Lake is conveyed through the 30-inch diameter underflow pipe. This requirement ensures that the design modifications to Panther Hollow Lake maintain a minimum freeboard of 1 foot during these conditions.

The proposed 4MR Project alternative was evaluated under both normal pool condition (elevation 811 feet; NAVD 1988) and the 100-year water surface elevation (elevation 833 feet; NAVD 1988) of the Monongahela River. These simulations were completed to determine if potential backwater conditions, caused by high stage at the Monongahela River, could impact the flow into or out of Panther Hollow Lake. The results demonstrate that Panther Hollow Lake is located sufficiently upstream and not influenced by backwater from the Monongahela River under the modeled conditions.

5 Simulation results

Table 1 includes results at key locations in and around Panther Hollow Lake. Although six different design storms were simulated, the 100-year, 24-hour design storm results are highlighted in bold.

Table 1: Simulation results at key hydraulic locations

Design Storm (24-hour duration)	PHL Forebay				Panther Hollow Lake		PHL Underflow Pipe		
	Maximum level		Peak discharge		Maximum level		Peak flows		Peak velocity
	Depth (ft)	Elevation (ft)	[MGD]	[CFS]	Depth (ft)	Elevation (ft)	[MGD]	[CFS]	[FPS]
1-Year	3.1	799.1	33.7	52.1	11.2	807.2	18.3	28.3	9.4
2-Year	3.1	799.1	50.6	78.3	12.0	808.0	23.2	35.8	9.5
5-Year	3.2	799.2	81.6	126.3	13.1	809.1	29.2	45.2	9.5
10-Year	3.2	799.2	111.7	172.8	14.1	810.1	30.6	47.3	9.6
25-Year	3.3	799.3	144.2	223.1	15.1	811.1	31.5	48.7	9.9
100-Year	**3.8**	**799.8**	**211.6**	**328.6**	**16.8**	**812.8**	**33.0**	**51.0**	**10.4**

The simulation results for the 100-year, 24-hour design storm indicate that Panther Hollow Lake would experience a peak water surface elevation of 812.8 feet which is below the activation level of the emergency spillway of 813 feet. Figure 3 shows the change in water surface elevation over time in Panther Hollow Lake that would occur during the 100-year, 24-hour design storm. Figure 4 shows the relationship between the inflow into Panther Hollow Lake from the Forebay versus the discharge from the Lake through the underflow pipe. This demonstrates the attenuation effectiveness of the Lake.

Figure 3: Panther Hollow Lake water surface elevation (100-year, 24-hour design storm)

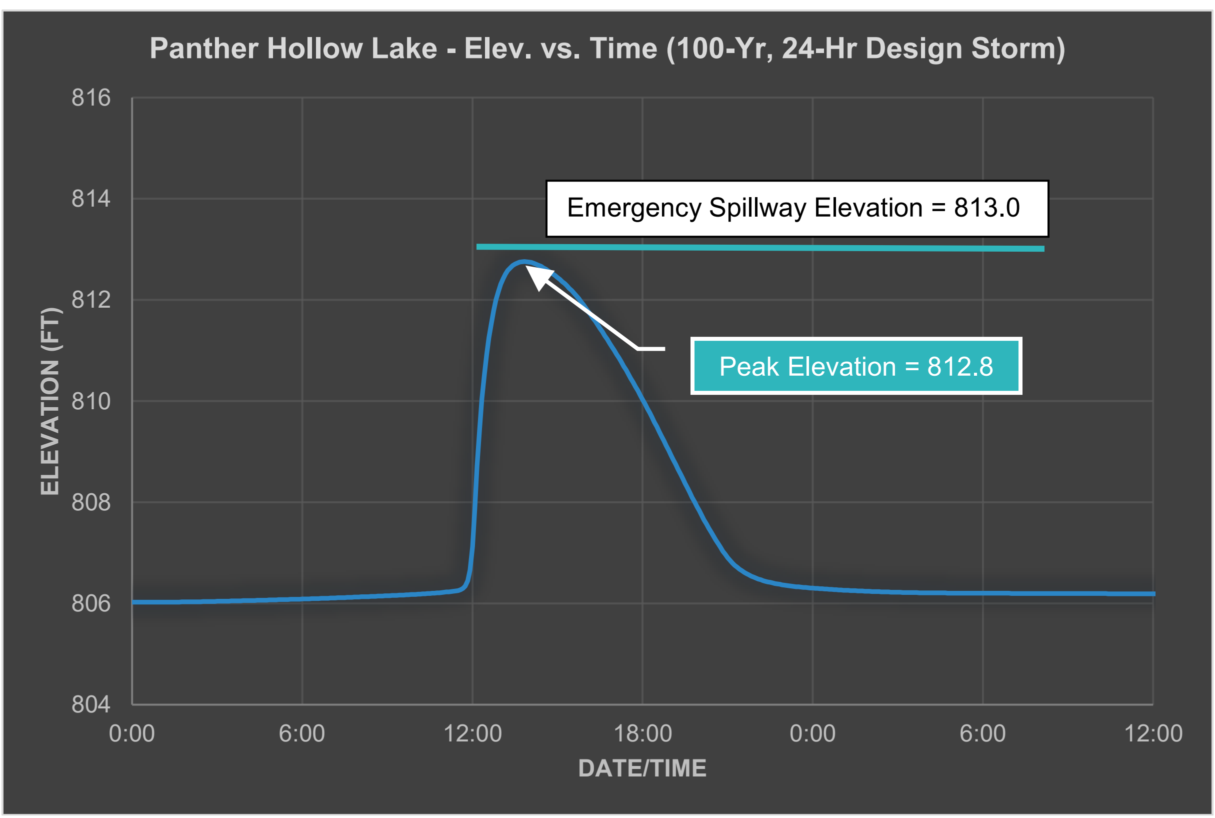
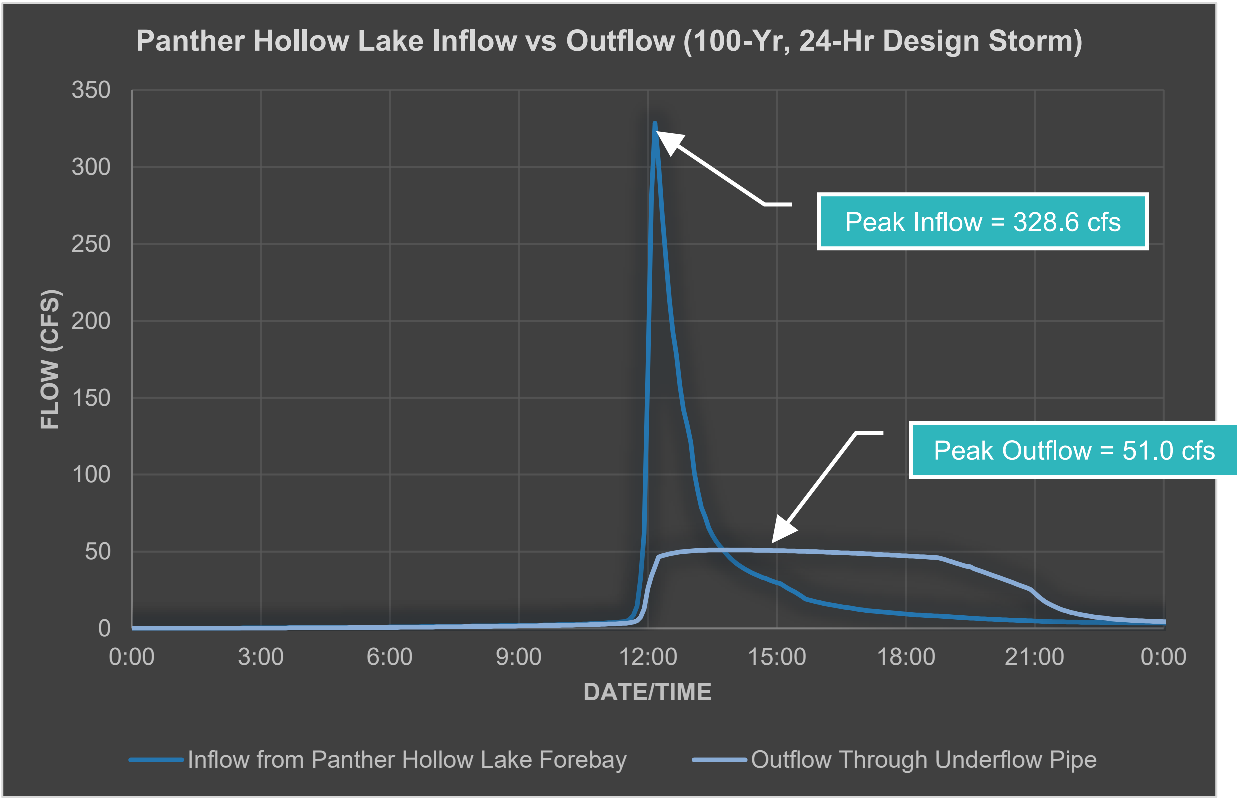


Figure 4: Panther Hollow Lake inflow and outflow (100-year, 24-hour design storm)



6 Conclusion

The simulation results of the modeling investigation indicate that the proposed 4MR Project meets the minimum freeboard requirement of 1 foot during the 100-year, 24-hour design storm and that the emergency spillway is not activated for this design condition. The results also indicate that the proposed project, and proposed modifications to Panther Hollow Lake, effectively manage the 100-year influent peak flow from the Forebay of 328.6 cfs to an outgoing peak flow of 51.0 cfs.

MODEL SUMMARY

4MR Core Alternative Design Storm Results (711 and 733 Mon River Stages)										
Design Storm (24-hour)	PHL Forebay		PHL Forebay Inflow to PHL		Panther Hollow Lake		PHL Underflow Discharge			
	Maximum Level		Peak Flow		Maximum Level		Peak Flows		Peak Velocity	
	Depth (ft)	Elevation (ft)	[MGD]	[CFS]	Depth (ft)	Elevation (ft)	[MGD]	[CFS]	[FPS]	
1-Year	3.1	799.1	33.7	52.1	11.2	807.2	18.3	28.3	9.4	
2-Year	3.1	799.1	50.6	78.3	12.0	808.0	23.2	35.8	9.5	
5-Year	3.2	799.2	81.6	126.3	13.1	809.1	29.2	45.2	9.5	
10-Year	3.2	799.2	111.7	172.8	14.1	810.1	30.6	47.3	9.6	
25-Year	3.3	799.3	144.2	223.1	15.1	811.1	31.5	48.7	9.9	
100-Year	3.8	799.8	212.4	328.6	16.8	812.8	33.0	51.0	10.4	

ROUTING HYDROGRAPHS

	4MR Core Project Alterantive - 1-Year, 24-Hour Design Storm (711 and 733 Mon River Stage)								
	PHL Forebay		PHL Forebay Weir		Panther Hollow Lake		PHL Underflow Pipe		
Maximums	3.1	799.1	33.7	52.1	11.2	807.2	18.3	28.3	9.4
Date/Time	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Velocity (fps)
10/07/03 00:05	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:10	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:15	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:20	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:25	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:30	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:35	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:40	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:45	2.01	798.01	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:50	2.02	798.02	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:55	2.03	798.03	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:00	2.04	798.04	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:05	2.05	798.05	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:10	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:15	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:20	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:25	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:30	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:35	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:40	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:45	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:50	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:55	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:00	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:05	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:10	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:15	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:20	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:25	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:30	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:35	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:40	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:45	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:50	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:55	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:00	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:05	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:10	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:15	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:20	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:25	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:30	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:35	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:40	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:45	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:50	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:55	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:00	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:05	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:10	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:20	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:25	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:30	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:35	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:40	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:45	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:50	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:55	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:00	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:05	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:10	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 05:20	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:25	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:30	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:35	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:40	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:45	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:50	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:55	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:00	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:05	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:10	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:15	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:20	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:25	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:30	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:35	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:40	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:45	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:50	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:55	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:00	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:05	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:10	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:15	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:20	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:25	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:30	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:35	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:40	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:45	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:50	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:55	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:00	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:05	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:10	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:15	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:20	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:25	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:30	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:35	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:40	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:45	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:50	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:55	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:00	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:05	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:10	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:15	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:20	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:25	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:30	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:35	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:40	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:45	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:50	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
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10/07/03 10:00	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:05	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:10	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:15	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:20	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:25	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:30	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:35	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:40	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:45	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:50	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:55	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 11:00	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:05	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:10	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:15	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:20	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:25	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:30	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:35	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:40	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:45	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:50	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:55	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:00	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:05	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:10	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:15	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:20	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:25	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:30	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:35	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:40	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:45	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:50	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:55	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:00	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:05	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:10	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:15	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:20	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:25	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:30	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:35	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:40	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:45	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:50	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:55	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:00	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:05	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:10	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:15	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:20	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:25	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:30	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:35	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:40	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:45	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:50	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:55	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:00	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:05	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:10	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:15	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:20	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:25	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:30	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:35	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:40	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:45	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:50	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:55	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:00	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:05	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:10	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:15	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:20	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:25	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:30	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:35	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 16:40	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:45	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:50	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:55	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:00	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:05	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:10	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:15	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:20	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:25	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:30	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:35	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:40	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:45	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:50	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:55	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:00	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:05	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:10	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:15	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:20	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:25	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:30	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:35	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:40	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:45	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:50	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:55	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:00	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:05	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:10	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:15	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:20	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:25	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:30	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:35	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:40	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:45	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:50	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:55	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:00	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:05	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:10	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:15	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:20	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:25	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:30	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:35	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:40	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:45	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:50	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:55	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:00	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:05	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:10	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:15	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:20	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:25	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:30	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:35	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:40	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:45	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:50	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:55	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:00	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:05	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:10	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:15	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 22:20	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:25	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:30	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:35	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:40	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:45	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:50	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:55	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:00	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:05	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:10	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:15	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:20	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:25	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:30	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:35	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:40	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:45	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:50	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:55	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:00	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:05	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:10	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:15	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:20	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:25	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:30	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:35	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:40	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:45	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:50	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:55	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:00	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:05	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:10	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:15	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:20	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:25	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:30	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:35	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:40	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:45	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:50	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:55	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:00	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:05	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:10	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:15	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:20	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:25	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:30	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:35	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:40	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:45	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:50	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:55	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:00	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:05	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:10	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:15	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:20	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:25	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:30	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:35	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:40	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:45	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:50	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:55	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 04:00	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:05	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:10	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:15	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:20	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:25	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:30	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:35	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:40	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:45	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:50	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:55	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:00	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:05	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:10	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:15	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:20	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:25	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:30	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:35	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:40	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:45	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:50	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:55	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:00	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:05	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:10	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:15	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:20	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:25	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:30	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:35	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:40	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:45	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:50	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:55	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:00	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:05	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:10	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:15	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:20	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:25	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:30	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:35	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:40	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:45	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:50	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:55	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:00	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:05	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:10	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:15	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:20	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:25	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:30	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:35	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:40	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:45	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:50	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:55	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:00	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:05	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:10	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:15	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:20	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:25	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:30	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:35	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 09:40	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:45	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:50	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:55	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:00	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:05	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:10	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:15	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:20	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:25	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:30	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:35	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:40	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:45	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:50	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:55	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:00	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:05	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:10	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:15	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:20	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:25	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:30	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:35	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:40	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:45	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:50	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:55	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:00	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:05	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:10	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:15	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:20	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:25	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:30	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:35	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:40	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:45	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:50	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:55	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:00	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:05	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:10	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:15	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:20	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:25	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:30	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:35	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:40	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:45	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:50	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:55	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:00	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:05	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:10	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:15	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:20	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:25	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:30	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:35	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:40	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:45	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:50	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:55	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:00	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:05	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:10	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:15	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 15:20	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:25	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:30	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:35	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:40	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:45	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:50	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:55	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:00	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:05	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:10	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:15	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:20	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:25	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:30	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:35	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:40	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:45	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:50	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:55	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:00	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:05	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:10	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:15	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:20	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:25	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:30	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:35	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:40	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:45	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:50	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:55	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:00	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:05	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:10	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:15	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:20	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:25	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:30	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:35	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:40	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:45	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:50	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:55	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:00	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:05	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:10	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:15	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:20	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:25	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:30	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:35	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:40	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:45	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:50	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:55	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:00	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:05	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:10	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:15	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:20	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:25	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:30	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:35	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:40	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:45	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:50	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:55	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 21:00	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:05	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:10	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:15	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:20	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:25	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:30	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:35	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:40	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:45	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:50	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:55	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:00	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:05	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:10	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:15	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:20	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:25	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:30	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:35	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:40	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:45	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:50	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:55	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:00	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:05	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:10	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:15	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:20	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:25	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:30	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:35	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:40	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/08/03 23:45	3.00	799.00	0.05	0.08	10.00	806.00	0.00	0.00	0.00
10/08/03 23:50	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/08/03 23:55	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/09/03 00:00	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:05	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:10	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:15	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:20	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:25	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	1.20
10/09/03 00:30	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.25
10/09/03 00:35	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.30
10/09/03 00:40	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.35
10/09/03 00:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.39
10/09/03 00:50	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.43
10/09/03 00:55	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.46
10/09/03 01:00	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.49
10/09/03 01:05	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.52
10/09/03 01:10	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.55
10/09/03 01:15	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.57
10/09/03 01:20	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.59
10/09/03 01:25	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.62
10/09/03 01:30	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.63
10/09/03 01:35	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.65
10/09/03 01:40	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.67
10/09/03 01:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.68
10/09/03 01:50	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.02	1.70
10/09/03 01:55	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.71
10/09/03 02:00	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.72
10/09/03 02:05	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.73
10/09/03 02:10	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.74
10/09/03 02:15	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.75
10/09/03 02:20	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.76
10/09/03 02:25	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:30	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:35	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.78

10/09/03 02:40	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.79
10/09/03 02:45	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.79
10/09/03 02:50	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 02:55	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 03:00	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:05	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:10	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.81
10/09/03 03:15	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.80
10/09/03 03:20	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:25	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:30	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:35	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:40	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:45	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.05	1.80
10/09/03 03:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:05	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:10	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:15	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:20	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:25	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:30	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:35	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.81
10/09/03 04:40	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:45	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.83
10/09/03 04:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.84
10/09/03 05:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.85
10/09/03 05:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.85
10/09/03 05:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.86
10/09/03 05:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.87
10/09/03 05:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.89
10/09/03 05:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:40	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:45	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:50	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:55	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.92
10/09/03 06:00	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 06:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 07:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.03
10/09/03 08:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04

10/09/03 08:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:15	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:20	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:25	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:30	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:35	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:40	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:45	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.08
10/09/03 09:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.10
10/09/03 10:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14

10/09/03 14:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.15
10/09/03 17:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16

10/09/03 19:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 21:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16

10/10/03 01:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:40	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 02:45	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 02:50	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.18
10/10/03 02:55	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.18
10/10/03 03:00	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.18
10/10/03 03:05	3.00	799.00	0.10	0.15	10.03	806.03	0.08	0.12	2.19
10/10/03 03:10	3.00	799.00	0.10	0.16	10.03	806.03	0.08	0.12	2.19
10/10/03 03:15	3.00	799.00	0.11	0.16	10.03	806.03	0.08	0.12	2.20
10/10/03 03:20	3.00	799.00	0.11	0.17	10.03	806.03	0.08	0.12	2.21
10/10/03 03:25	3.00	799.00	0.12	0.18	10.03	806.03	0.08	0.13	2.22
10/10/03 03:30	3.00	799.00	0.12	0.19	10.03	806.03	0.08	0.13	2.23
10/10/03 03:35	3.00	799.00	0.12	0.19	10.03	806.03	0.08	0.13	2.24
10/10/03 03:40	3.00	799.00	0.13	0.19	10.03	806.03	0.09	0.13	2.25
10/10/03 03:45	3.00	799.00	0.13	0.20	10.03	806.03	0.09	0.13	2.26
10/10/03 03:50	3.00	799.00	0.13	0.20	10.03	806.03	0.09	0.14	2.27
10/10/03 03:55	3.00	799.00	0.13	0.20	10.03	806.03	0.09	0.14	2.28
10/10/03 04:00	3.00	799.00	0.13	0.21	10.03	806.03	0.09	0.14	2.29
10/10/03 04:05	3.00	799.00	0.14	0.21	10.03	806.03	0.09	0.14	2.30
10/10/03 04:10	3.00	799.00	0.14	0.22	10.03	806.03	0.09	0.15	2.32
10/10/03 04:15	3.00	799.00	0.15	0.23	10.03	806.03	0.10	0.15	2.33
10/10/03 04:20	3.00	799.00	0.15	0.23	10.03	806.03	0.10	0.15	2.34
10/10/03 04:25	3.00	799.00	0.15	0.24	10.03	806.03	0.10	0.15	2.35
10/10/03 04:30	3.00	799.00	0.16	0.24	10.03	806.03	0.10	0.16	2.37
10/10/03 04:35	3.00	799.00	0.16	0.25	10.03	806.03	0.10	0.16	2.38
10/10/03 04:40	3.00	799.00	0.17	0.26	10.03	806.03	0.11	0.16	2.39
10/10/03 04:45	3.00	799.00	0.17	0.26	10.03	806.03	0.11	0.17	2.40
10/10/03 04:50	3.00	799.00	0.17	0.27	10.03	806.03	0.11	0.17	2.42
10/10/03 04:55	3.00	799.00	0.18	0.27	10.04	806.04	0.11	0.17	2.43
10/10/03 05:00	3.00	799.00	0.18	0.28	10.04	806.04	0.11	0.18	2.44
10/10/03 05:05	3.00	799.00	0.18	0.28	10.04	806.04	0.12	0.18	2.45
10/10/03 05:10	3.00	799.00	0.19	0.29	10.04	806.04	0.12	0.18	2.47
10/10/03 05:15	3.00	799.00	0.19	0.29	10.04	806.04	0.12	0.19	2.48
10/10/03 05:20	3.00	799.00	0.19	0.30	10.04	806.04	0.12	0.19	2.49
10/10/03 05:25	3.00	799.00	0.20	0.30	10.04	806.04	0.13	0.19	2.51
10/10/03 05:30	3.00	799.00	0.20	0.31	10.04	806.04	0.13	0.20	2.52
10/10/03 05:35	3.00	799.00	0.20	0.31	10.04	806.04	0.13	0.20	2.54
10/10/03 05:40	3.00	799.00	0.21	0.32	10.04	806.04	0.13	0.21	2.55
10/10/03 05:45	3.00	799.00	0.21	0.32	10.04	806.04	0.14	0.21	2.56
10/10/03 05:50	3.00	799.00	0.21	0.33	10.04	806.04	0.14	0.21	2.58
10/10/03 05:55	3.00	799.00	0.21	0.33	10.04	806.04	0.14	0.22	2.59
10/10/03 06:00	3.00	799.00	0.22	0.33	10.04	806.04	0.14	0.22	2.61
10/10/03 06:05	3.00	799.00	0.22	0.34	10.04	806.04	0.15	0.23	2.62
10/10/03 06:10	3.00	799.00	0.22	0.34	10.04	806.04	0.15	0.23	2.64
10/10/03 06:15	3.00	799.00	0.23	0.35	10.04	806.04	0.15	0.23	2.65
10/10/03 06:20	3.00	799.00	0.23	0.35	10.04	806.04	0.15	0.24	2.66
10/10/03 06:25	3.00	799.00	0.23	0.36	10.04	806.04	0.16	0.24	2.68
10/10/03 06:30	3.00	799.00	0.23	0.36	10.05	806.05	0.16	0.25	2.69
10/10/03 06:35	3.00	799.00	0.24	0.37	10.05	806.05	0.16	0.25	2.71
10/10/03 06:40	3.00	799.00	0.24	0.37	10.05	806.05	0.17	0.26	2.72
10/10/03 06:45	3.00	799.00	0.24	0.38	10.05	806.05	0.17	0.26	2.74
10/10/03 06:50	3.00	799.00	0.25	0.38	10.05	806.05	0.17	0.27	2.75
10/10/03 06:55	3.00	799.00	0.25	0.39	10.05	806.05	0.17	0.27	2.77

10/10/03 07:00	3.00	799.00	0.25	0.39	10.05	806.05	0.18	0.28	2.78
10/10/03 07:05	3.00	799.00	0.26	0.40	10.05	806.05	0.18	0.28	2.80
10/10/03 07:10	3.00	799.00	0.27	0.41	10.05	806.05	0.18	0.28	2.81
10/10/03 07:15	3.00	799.00	0.27	0.42	10.05	806.05	0.19	0.29	2.83
10/10/03 07:20	3.00	799.00	0.28	0.43	10.05	806.05	0.19	0.30	2.85
10/10/03 07:25	3.00	799.00	0.29	0.44	10.05	806.05	0.19	0.30	2.86
10/10/03 07:30	3.00	799.00	0.29	0.45	10.05	806.05	0.20	0.31	2.88
10/10/03 07:35	3.00	799.00	0.30	0.46	10.05	806.05	0.20	0.31	2.90
10/10/03 07:40	3.00	799.00	0.31	0.47	10.05	806.05	0.21	0.32	2.92
10/10/03 07:45	3.00	799.00	0.31	0.48	10.05	806.05	0.21	0.33	2.94
10/10/03 07:50	3.00	799.00	0.32	0.49	10.05	806.05	0.21	0.33	2.96
10/10/03 07:55	3.00	799.00	0.32	0.50	10.06	806.06	0.22	0.34	2.97
10/10/03 08:00	3.00	799.00	0.33	0.51	10.06	806.06	0.22	0.35	2.99
10/10/03 08:05	3.00	799.00	0.34	0.52	10.06	806.06	0.23	0.35	3.01
10/10/03 08:10	3.00	799.00	0.34	0.53	10.06	806.06	0.23	0.36	3.03
10/10/03 08:15	3.00	799.00	0.35	0.54	10.06	806.06	0.24	0.37	3.06
10/10/03 08:20	3.00	799.00	0.36	0.55	10.06	806.06	0.24	0.38	3.07
10/10/03 08:25	3.00	799.00	0.36	0.56	10.06	806.06	0.25	0.38	3.09
10/10/03 08:30	3.00	799.00	0.37	0.57	10.06	806.06	0.25	0.39	3.11
10/10/03 08:35	3.00	799.00	0.37	0.58	10.06	806.06	0.26	0.40	3.12
10/10/03 08:40	3.00	799.00	0.38	0.59	10.06	806.06	0.26	0.41	3.14
10/10/03 08:45	3.01	799.01	0.38	0.59	10.06	806.06	0.27	0.42	3.16
10/10/03 08:50	3.01	799.01	0.39	0.60	10.06	806.06	0.27	0.42	3.18
10/10/03 08:55	3.01	799.01	0.39	0.61	10.07	806.07	0.28	0.43	3.19
10/10/03 09:00	3.01	799.01	0.40	0.61	10.07	806.07	0.28	0.44	3.21
10/10/03 09:05	3.01	799.01	0.40	0.62	10.07	806.07	0.29	0.45	3.23
10/10/03 09:10	3.01	799.01	0.41	0.63	10.07	806.07	0.30	0.46	3.24
10/10/03 09:15	3.01	799.01	0.42	0.64	10.07	806.07	0.30	0.47	3.26
10/10/03 09:20	3.01	799.01	0.42	0.65	10.07	806.07	0.31	0.47	3.28
10/10/03 09:25	3.01	799.01	0.43	0.66	10.07	806.07	0.31	0.48	3.30
10/10/03 09:30	3.01	799.01	0.43	0.67	10.07	806.07	0.32	0.49	3.32
10/10/03 09:35	3.01	799.01	0.44	0.68	10.07	806.07	0.32	0.50	3.33
10/10/03 09:40	3.01	799.01	0.45	0.70	10.07	806.07	0.33	0.51	3.35
10/10/03 09:45	3.01	799.01	0.46	0.71	10.07	806.07	0.34	0.52	3.37
10/10/03 09:50	3.01	799.01	0.47	0.72	10.07	806.07	0.34	0.53	3.39
10/10/03 09:55	3.01	799.01	0.48	0.74	10.08	806.08	0.35	0.54	3.41
10/10/03 10:00	3.01	799.01	0.49	0.75	10.08	806.08	0.36	0.55	3.43
10/10/03 10:05	3.01	799.01	0.50	0.78	10.08	806.08	0.36	0.56	3.45
10/10/03 10:10	3.01	799.01	0.52	0.80	10.08	806.08	0.37	0.57	3.47
10/10/03 10:15	3.01	799.01	0.53	0.83	10.08	806.08	0.38	0.59	3.49
10/10/03 10:20	3.01	799.01	0.54	0.84	10.08	806.08	0.39	0.60	3.52
10/10/03 10:25	3.01	799.01	0.54	0.84	10.08	806.08	0.40	0.61	3.54
10/10/03 10:30	3.01	799.01	0.58	0.90	10.08	806.08	0.40	0.63	3.57
10/10/03 10:35	3.01	799.01	0.61	0.95	10.09	806.09	0.41	0.64	3.59
10/10/03 10:40	3.01	799.01	0.64	1.00	10.09	806.09	0.43	0.66	3.62
10/10/03 10:45	3.01	799.01	0.67	1.04	10.09	806.09	0.44	0.68	3.66
10/10/03 10:50	3.01	799.01	0.70	1.09	10.09	806.09	0.45	0.70	3.69
10/10/03 10:55	3.01	799.01	0.73	1.13	10.09	806.09	0.47	0.72	3.72
10/10/03 11:00	3.01	799.01	0.76	1.17	10.09	806.09	0.48	0.74	3.75
10/10/03 11:05	3.01	799.01	0.81	1.25	10.10	806.10	0.50	0.77	3.78
10/10/03 11:10	3.01	799.01	0.86	1.33	10.10	806.10	0.52	0.80	3.83
10/10/03 11:15	3.01	799.01	0.91	1.41	10.10	806.10	0.54	0.83	3.88
10/10/03 11:20	3.01	799.01	0.96	1.49	10.10	806.10	0.56	0.87	3.93
10/10/03 11:25	3.01	799.01	1.00	1.55	10.11	806.11	0.58	0.90	3.98
10/10/03 11:30	3.01	799.01	1.04	1.62	10.11	806.11	0.61	0.94	4.03
10/10/03 11:35	3.01	799.01	1.27	1.96	10.11	806.11	0.64	1.00	4.09
10/10/03 11:40	3.01	799.01	1.53	2.37	10.12	806.12	0.69	1.07	4.19
10/10/03 11:45	3.01	799.01	1.81	2.80	10.13	806.13	0.76	1.17	4.28
10/10/03 11:50	3.02	799.02	3.58	5.54	10.15	806.15	0.89	1.37	4.46
10/10/03 11:55	3.03	799.03	5.35	8.28	10.17	806.17	1.15	1.78	4.80
10/10/03 12:00	3.04	799.04	8.80	13.61	10.21	806.21	1.55	2.40	5.21
10/10/03 12:05	3.04	799.04	9.93	15.37	10.26	806.26	2.10	3.25	5.66
10/10/03 12:10	3.05	799.05	11.34	17.55	10.30	806.30	2.70	4.18	6.05
10/10/03 12:15	3.07	799.07	18.06	27.95	10.37	806.37	3.51	5.44	6.46
10/10/03 12:20	3.08	799.08	24.37	37.71	10.46	806.46	5.01	7.76	7.06
10/10/03 12:25	3.09	799.09	26.74	41.37	10.54	806.54	6.42	9.93	7.49
10/10/03 12:30	3.10	799.10	33.68	52.10	10.68	806.68	8.94	13.84	8.08
10/10/03 12:35	3.09	799.09	31.34	48.49	10.80	806.80	11.59	17.93	8.55

10/10/03 12:40	3.09	799.09	29.56	45.74	10.89	806.89	13.83	21.40	8.87
10/10/03 12:45	3.09	799.09	27.97	43.28	10.96	806.96	15.70	24.29	9.09
10/10/03 12:50	3.08	799.08	26.63	41.21	11.02	807.02	16.67	25.79	9.20
10/10/03 12:55	3.08	799.08	25.41	39.31	11.07	807.07	17.08	26.43	9.25
10/10/03 13:00	3.08	799.08	24.32	37.62	11.11	807.11	17.42	26.96	9.28
10/10/03 13:05	3.08	799.08	23.15	35.81	11.15	807.15	17.70	27.39	9.31
10/10/03 13:10	3.07	799.07	21.90	33.88	11.18	807.18	17.92	27.72	9.33
10/10/03 13:15	3.07	799.07	20.92	32.36	11.20	807.20	18.08	27.97	9.34
10/10/03 13:20	3.07	799.07	19.90	30.80	11.21	807.21	18.19	28.15	9.36
10/10/03 13:25	3.07	799.07	18.99	29.38	11.22	807.22	18.27	28.27	9.36
10/10/03 13:30	3.07	799.07	18.09	27.98	11.22	807.22	18.31	28.33	9.37
10/10/03 13:35	3.06	799.06	17.18	26.58	11.22	807.22	18.31	28.33	9.37
10/10/03 13:40	3.06	799.06	16.16	25.00	11.22	807.22	18.28	28.28	9.36
10/10/03 13:45	3.06	799.06	14.97	23.17	11.21	807.21	18.21	28.17	9.36
10/10/03 13:50	3.06	799.06	14.19	21.96	11.19	807.19	18.09	27.99	9.35
10/10/03 13:55	3.05	799.05	13.49	20.87	11.17	807.17	17.96	27.78	9.34
10/10/03 14:00	3.05	799.05	12.73	19.69	11.15	807.15	17.80	27.54	9.32
10/10/03 14:05	3.05	799.05	11.99	18.54	11.13	807.13	17.61	27.25	9.30
10/10/03 14:10	3.05	799.05	11.41	17.65	11.10	807.10	17.40	26.92	9.28
10/10/03 14:15	3.05	799.05	10.89	16.84	11.07	807.07	17.17	26.57	9.26
10/10/03 14:20	3.05	799.05	10.33	15.99	11.04	807.04	16.93	26.20	9.23
10/10/03 14:25	3.04	799.04	9.84	15.23	11.01	807.01	16.67	25.79	9.21
10/10/03 14:30	3.04	799.04	9.41	14.56	10.98	806.98	16.39	25.36	9.18
10/10/03 14:35	3.04	799.04	8.98	13.89	10.94	806.94	15.59	24.12	9.10
10/10/03 14:40	3.04	799.04	8.61	13.33	10.91	806.91	14.83	22.94	9.01
10/10/03 14:45	3.04	799.04	8.22	12.72	10.88	806.88	14.13	21.86	8.93
10/10/03 14:50	3.04	799.04	7.83	12.11	10.86	806.86	13.47	20.83	8.85
10/10/03 14:55	3.04	799.04	7.48	11.57	10.83	806.83	12.84	19.87	8.76
10/10/03 15:00	3.04	799.04	7.18	11.10	10.80	806.80	12.26	18.97	8.68
10/10/03 15:05	3.03	799.03	6.89	10.67	10.78	806.78	11.72	18.13	8.60
10/10/03 15:10	3.03	799.03	6.64	10.27	10.76	806.76	11.21	17.34	8.52
10/10/03 15:15	3.03	799.03	6.39	9.89	10.74	806.74	10.73	16.60	8.44
10/10/03 15:20	3.03	799.03	6.17	9.55	10.72	806.72	10.29	15.91	8.36
10/10/03 15:25	3.03	799.03	6.03	9.33	10.70	806.70	9.87	15.27	8.29
10/10/03 15:30	3.03	799.03	5.80	8.98	10.68	806.68	9.49	14.68	8.22
10/10/03 15:35	3.03	799.03	5.61	8.68	10.66	806.66	9.12	14.11	8.15
10/10/03 15:40	3.03	799.03	5.46	8.45	10.64	806.64	8.79	13.60	8.08
10/10/03 15:45	3.03	799.03	5.33	8.25	10.63	806.63	8.47	13.10	8.01
10/10/03 15:50	3.03	799.03	5.20	8.05	10.61	806.61	8.17	12.64	7.95
10/10/03 15:55	3.03	799.03	5.07	7.84	10.60	806.60	7.89	12.21	7.89
10/10/03 16:00	3.03	799.03	4.93	7.63	10.59	806.59	7.63	11.81	7.83
10/10/03 16:05	3.03	799.03	4.77	7.38	10.57	806.57	7.38	11.42	7.77
10/10/03 16:10	3.03	799.03	4.59	7.10	10.56	806.56	7.14	11.05	7.71
10/10/03 16:15	3.03	799.03	4.41	6.82	10.55	806.55	6.91	10.69	7.65
10/10/03 16:20	3.02	799.02	4.24	6.56	10.54	806.54	6.68	10.33	7.59
10/10/03 16:25	3.02	799.02	4.08	6.31	10.53	806.53	6.46	9.99	7.53
10/10/03 16:30	3.02	799.02	3.93	6.08	10.51	806.51	6.25	9.66	7.47
10/10/03 16:35	3.02	799.02	3.79	5.87	10.50	806.50	6.04	9.35	7.41
10/10/03 16:40	3.02	799.02	3.67	5.67	10.49	806.49	5.84	9.04	7.36
10/10/03 16:45	3.02	799.02	3.55	5.50	10.48	806.48	5.65	8.75	7.30
10/10/03 16:50	3.02	799.02	3.46	5.36	10.47	806.47	5.47	8.47	7.24
10/10/03 16:55	3.02	799.02	3.38	5.23	10.46	806.46	5.30	8.20	7.19
10/10/03 17:00	3.02	799.02	3.28	5.08	10.45	806.45	5.14	7.95	7.14
10/10/03 17:05	3.02	799.02	3.16	4.89	10.44	806.44	4.98	7.71	7.08
10/10/03 17:10	3.02	799.02	3.03	4.69	10.43	806.43	4.83	7.47	7.02
10/10/03 17:15	3.02	799.02	2.92	4.51	10.42	806.42	4.68	7.24	6.97
10/10/03 17:20	3.02	799.02	2.82	4.36	10.42	806.42	4.54	7.02	6.92
10/10/03 17:25	3.02	799.02	2.72	4.21	10.41	806.41	4.40	6.80	6.87
10/10/03 17:30	3.02	799.02	2.63	4.07	10.40	806.40	4.26	6.59	6.81
10/10/03 17:35	3.02	799.02	2.55	3.94	10.39	806.39	4.13	6.39	6.76
10/10/03 17:40	3.02	799.02	2.47	3.83	10.38	806.38	4.00	6.20	6.71
10/10/03 17:45	3.02	799.02	2.40	3.72	10.37	806.37	3.88	6.01	6.66
10/10/03 17:50	3.02	799.02	2.34	3.61	10.37	806.37	3.77	5.83	6.61
10/10/03 17:55	3.02	799.02	2.27	3.52	10.36	806.36	3.66	5.66	6.56
10/10/03 18:00	3.02	799.02	2.22	3.43	10.35	806.35	3.55	5.50	6.51
10/10/03 18:05	3.02	799.02	2.16	3.34	10.35	806.35	3.45	5.34	6.46
10/10/03 18:10	3.02	799.02	2.11	3.26	10.34	806.34	3.35	5.19	6.42
10/10/03 18:15	3.02	799.02	2.05	3.18	10.33	806.33	3.26	5.04	6.37

10/10/03 18:20	3.02	799.02	2.01	3.10	10.33	806.33	3.17	4.91	6.32
10/10/03 18:25	3.01	799.01	1.96	3.04	10.32	806.32	3.09	4.77	6.28
10/10/03 18:30	3.01	799.01	1.92	2.98	10.32	806.32	3.00	4.65	6.23
10/10/03 18:35	3.01	799.01	1.88	2.91	10.31	806.31	2.93	4.53	6.19
10/10/03 18:40	3.01	799.01	1.84	2.85	10.30	806.30	2.85	4.41	6.15
10/10/03 18:45	3.01	799.01	1.80	2.78	10.30	806.30	2.78	4.30	6.11
10/10/03 18:50	3.01	799.01	1.76	2.72	10.29	806.29	2.71	4.19	6.07
10/10/03 18:55	3.01	799.01	1.72	2.66	10.29	806.29	2.64	4.09	6.03
10/10/03 19:00	3.01	799.01	1.68	2.60	10.28	806.28	2.58	3.99	5.99
10/10/03 19:05	3.01	799.01	1.65	2.55	10.28	806.28	2.52	3.89	5.95
10/10/03 19:10	3.01	799.01	1.62	2.50	10.28	806.28	2.46	3.80	5.92
10/10/03 19:15	3.01	799.01	1.59	2.46	10.27	806.27	2.40	3.71	5.88
10/10/03 19:20	3.01	799.01	1.56	2.41	10.27	806.27	2.34	3.63	5.84
10/10/03 19:25	3.01	799.01	1.53	2.37	10.26	806.26	2.29	3.54	5.81
10/10/03 19:30	3.01	799.01	1.50	2.32	10.26	806.26	2.24	3.47	5.78
10/10/03 19:35	3.01	799.01	1.48	2.28	10.26	806.26	2.19	3.39	5.74
10/10/03 19:40	3.01	799.01	1.45	2.24	10.25	806.25	2.14	3.32	5.71
10/10/03 19:45	3.01	799.01	1.43	2.21	10.25	806.25	2.10	3.25	5.68
10/10/03 19:50	3.01	799.01	1.40	2.17	10.25	806.25	2.05	3.18	5.64
10/10/03 19:55	3.01	799.01	1.38	2.14	10.24	806.24	2.01	3.11	5.61
10/10/03 20:00	3.01	799.01	1.36	2.11	10.24	806.24	1.97	3.05	5.58
10/10/03 20:05	3.01	799.01	1.34	2.07	10.24	806.24	1.93	2.99	5.55
10/10/03 20:10	3.01	799.01	1.31	2.02	10.23	806.23	1.89	2.93	5.52
10/10/03 20:15	3.01	799.01	1.28	1.98	10.23	806.23	1.86	2.87	5.49
10/10/03 20:20	3.01	799.01	1.26	1.94	10.23	806.23	1.82	2.82	5.46
10/10/03 20:25	3.01	799.01	1.23	1.91	10.22	806.22	1.78	2.76	5.43
10/10/03 20:30	3.01	799.01	1.21	1.88	10.22	806.22	1.75	2.71	5.40
10/10/03 20:35	3.01	799.01	1.19	1.85	10.22	806.22	1.72	2.65	5.38
10/10/03 20:40	3.01	799.01	1.18	1.82	10.21	806.21	1.68	2.60	5.35
10/10/03 20:45	3.01	799.01	1.16	1.80	10.21	806.21	1.65	2.56	5.32
10/10/03 20:50	3.01	799.01	1.15	1.78	10.21	806.21	1.62	2.51	5.29
10/10/03 20:55	3.01	799.01	1.13	1.76	10.21	806.21	1.59	2.46	5.27
10/10/03 21:00	3.01	799.01	1.12	1.73	10.20	806.20	1.57	2.42	5.24
10/10/03 21:05	3.01	799.01	1.11	1.71	10.20	806.20	1.54	2.38	5.22
10/10/03 21:10	3.01	799.01	1.09	1.69	10.20	806.20	1.51	2.34	5.19
10/10/03 21:15	3.01	799.01	1.08	1.67	10.20	806.20	1.49	2.30	5.17
10/10/03 21:20	3.01	799.01	1.07	1.65	10.20	806.20	1.46	2.26	5.15
10/10/03 21:25	3.01	799.01	1.06	1.64	10.19	806.19	1.44	2.23	5.13
10/10/03 21:30	3.01	799.01	1.05	1.62	10.19	806.19	1.42	2.19	5.10
10/10/03 21:35	3.01	799.01	1.04	1.61	10.19	806.19	1.40	2.16	5.08
10/10/03 21:40	3.01	799.01	1.03	1.59	10.19	806.19	1.38	2.13	5.06
10/10/03 21:45	3.01	799.01	1.02	1.58	10.19	806.19	1.36	2.10	5.04
10/10/03 21:50	3.01	799.01	1.01	1.56	10.18	806.18	1.34	2.07	5.02
10/10/03 21:55	3.01	799.01	1.00	1.55	10.18	806.18	1.32	2.04	4.99
10/10/03 22:00	3.01	799.01	0.99	1.54	10.18	806.18	1.30	2.01	4.98
10/10/03 22:05	3.01	799.01	0.98	1.52	10.18	806.18	1.28	1.99	4.96
10/10/03 22:10	3.01	799.01	0.98	1.51	10.18	806.18	1.27	1.96	4.94
10/10/03 22:15	3.01	799.01	0.97	1.50	10.18	806.18	1.25	1.93	4.92
10/10/03 22:20	3.01	799.01	0.96	1.49	10.17	806.17	1.23	1.91	4.91
10/10/03 22:25	3.01	799.01	0.95	1.47	10.17	806.17	1.22	1.89	4.89
10/10/03 22:30	3.01	799.01	0.95	1.46	10.17	806.17	1.20	1.86	4.88
10/10/03 22:35	3.01	799.01	0.94	1.45	10.17	806.17	1.19	1.84	4.86
10/10/03 22:40	3.01	799.01	0.93	1.44	10.17	806.17	1.18	1.82	4.85
10/10/03 22:45	3.01	799.01	0.93	1.43	10.17	806.17	1.16	1.80	4.83
10/10/03 22:50	3.01	799.01	0.92	1.43	10.17	806.17	1.15	1.78	4.82
10/10/03 22:55	3.01	799.01	0.92	1.42	10.17	806.17	1.14	1.76	4.80
10/10/03 23:00	3.01	799.01	0.91	1.41	10.16	806.16	1.13	1.74	4.79
10/10/03 23:05	3.01	799.01	0.91	1.40	10.16	806.16	1.12	1.73	4.78
10/10/03 23:10	3.01	799.01	0.90	1.40	10.16	806.16	1.11	1.71	4.76
10/10/03 23:15	3.01	799.01	0.90	1.39	10.16	806.16	1.09	1.69	4.75
10/10/03 23:20	3.01	799.01	0.90	1.39	10.16	806.16	1.08	1.68	4.74
10/10/03 23:25	3.01	799.01	0.89	1.38	10.16	806.16	1.07	1.66	4.73
10/10/03 23:30	3.01	799.01	0.89	1.38	10.16	806.16	1.07	1.65	4.72
10/10/03 23:35	3.01	799.01	0.89	1.37	10.16	806.16	1.06	1.63	4.71
10/10/03 23:40	3.01	799.01	0.88	1.37	10.16	806.16	1.05	1.62	4.70
10/10/03 23:45	3.01	799.01	0.88	1.36	10.16	806.16	1.04	1.61	4.69
10/10/03 23:50	3.01	799.01	0.88	1.36	10.16	806.16	1.03	1.60	4.68
10/10/03 23:55	3.01	799.01	0.88	1.36	10.15	806.15	1.02	1.58	4.67

10/11/03 00:00	3.01	799.01	0.87	1.35	10.15	806.15	1.02	1.57	4.66
10/11/03 00:05	3.01	799.01	0.87	1.34	10.15	806.15	1.01	1.56	4.65
10/11/03 00:10	3.01	799.01	0.85	1.32	10.15	806.15	1.00	1.55	4.64
10/11/03 00:15	3.01	799.01	0.84	1.30	10.15	806.15	0.99	1.54	4.63
10/11/03 00:20	3.01	799.01	0.83	1.28	10.15	806.15	0.99	1.52	4.61
10/11/03 00:25	3.01	799.01	0.82	1.27	10.15	806.15	0.98	1.51	4.60
10/11/03 00:30	3.01	799.01	0.81	1.25	10.15	806.15	0.97	1.50	4.59
10/11/03 00:35	3.01	799.01	0.80	1.24	10.15	806.15	0.96	1.49	4.58
10/11/03 00:40	3.01	799.01	0.80	1.23	10.15	806.15	0.95	1.47	4.56
10/11/03 00:45	3.01	799.01	0.79	1.22	10.15	806.15	0.94	1.46	4.55
10/11/03 00:50	3.01	799.01	0.78	1.21	10.15	806.15	0.93	1.45	4.54
10/11/03 00:55	3.01	799.01	0.78	1.21	10.14	806.14	0.93	1.43	4.53
10/11/03 01:00	3.01	799.01	0.77	1.20	10.14	806.14	0.92	1.42	4.51
10/11/03 01:05	3.01	799.01	0.77	1.19	10.14	806.14	0.91	1.41	4.50
10/11/03 01:10	3.01	799.01	0.77	1.19	10.14	806.14	0.90	1.40	4.49
10/11/03 01:15	3.01	799.01	0.76	1.18	10.14	806.14	0.90	1.39	4.48
10/11/03 01:20	3.01	799.01	0.76	1.17	10.14	806.14	0.89	1.38	4.47
10/11/03 01:25	3.01	799.01	0.76	1.17	10.14	806.14	0.88	1.37	4.46
10/11/03 01:30	3.01	799.01	0.75	1.16	10.14	806.14	0.88	1.36	4.45
10/11/03 01:35	3.01	799.01	0.75	1.16	10.14	806.14	0.87	1.35	4.44
10/11/03 01:40	3.01	799.01	0.74	1.15	10.14	806.14	0.86	1.34	4.43
10/11/03 01:45	3.01	799.01	0.74	1.15	10.14	806.14	0.86	1.33	4.42
10/11/03 01:50	3.01	799.01	0.74	1.14	10.14	806.14	0.85	1.32	4.41
10/11/03 01:55	3.01	799.01	0.74	1.14	10.14	806.14	0.85	1.31	4.41
10/11/03 02:00	3.01	799.01	0.73	1.14	10.14	806.14	0.84	1.30	4.40
10/11/03 02:05	3.01	799.01	0.73	1.13	10.13	806.13	0.83	1.29	4.39
10/11/03 02:10	3.01	799.01	0.73	1.13	10.13	806.13	0.83	1.28	4.39
10/11/03 02:15	3.01	799.01	0.73	1.12	10.13	806.13	0.82	1.28	4.38
10/11/03 02:20	3.01	799.01	0.72	1.12	10.13	806.13	0.82	1.27	4.37
10/11/03 02:25	3.01	799.01	0.72	1.11	10.13	806.13	0.81	1.26	4.37
10/11/03 02:30	3.01	799.01	0.71	1.10	10.13	806.13	0.81	1.25	4.36
10/11/03 02:35	3.01	799.01	0.71	1.10	10.13	806.13	0.80	1.24	4.35
10/11/03 02:40	3.01	799.01	0.71	1.09	10.13	806.13	0.80	1.24	4.35
10/11/03 02:45	3.01	799.01	0.70	1.09	10.13	806.13	0.80	1.23	4.34
10/11/03 02:50	3.01	799.01	0.70	1.08	10.13	806.13	0.79	1.22	4.33
10/11/03 02:55	3.01	799.01	0.70	1.08	10.13	806.13	0.79	1.22	4.33
10/11/03 03:00	3.01	799.01	0.69	1.07	10.13	806.13	0.78	1.21	4.32
10/11/03 03:05	3.01	799.01	0.69	1.07	10.13	806.13	0.78	1.20	4.31
10/11/03 03:10	3.01	799.01	0.69	1.07	10.13	806.13	0.77	1.20	4.31
10/11/03 03:15	3.01	799.01	0.69	1.06	10.13	806.13	0.77	1.19	4.30
10/11/03 03:20	3.01	799.01	0.68	1.06	10.13	806.13	0.76	1.18	4.30
10/11/03 03:25	3.01	799.01	0.68	1.06	10.13	806.13	0.76	1.18	4.29
10/11/03 03:30	3.01	799.01	0.68	1.06	10.13	806.13	0.76	1.17	4.28
10/11/03 03:35	3.01	799.01	0.68	1.05	10.13	806.13	0.75	1.17	4.28
10/11/03 03:40	3.01	799.01	0.68	1.05	10.13	806.13	0.75	1.16	4.27
10/11/03 03:45	3.01	799.01	0.68	1.05	10.12	806.12	0.75	1.15	4.27
10/11/03 03:50	3.01	799.01	0.67	1.04	10.12	806.12	0.74	1.15	4.26
10/11/03 03:55	3.01	799.01	0.67	1.04	10.12	806.12	0.74	1.14	4.26
10/11/03 04:00	3.01	799.01	0.67	1.04	10.12	806.12	0.74	1.14	4.25
10/11/03 04:05	3.01	799.01	0.67	1.03	10.12	806.12	0.73	1.13	4.25
10/11/03 04:10	3.01	799.01	0.67	1.03	10.12	806.12	0.73	1.13	4.24
10/11/03 04:15	3.01	799.01	0.66	1.03	10.12	806.12	0.73	1.12	4.24
10/11/03 04:20	3.01	799.01	0.66	1.03	10.12	806.12	0.72	1.12	4.24
10/11/03 04:25	3.01	799.01	0.66	1.02	10.12	806.12	0.72	1.11	4.23
10/11/03 04:30	3.01	799.01	0.66	1.02	10.12	806.12	0.72	1.11	4.23
10/11/03 04:35	3.01	799.01	0.66	1.02	10.12	806.12	0.71	1.11	4.22
10/11/03 04:40	3.01	799.01	0.66	1.02	10.12	806.12	0.71	1.10	4.22
10/11/03 04:45	3.01	799.01	0.66	1.02	10.12	806.12	0.71	1.10	4.21
10/11/03 04:50	3.01	799.01	0.66	1.01	10.12	806.12	0.71	1.09	4.21
10/11/03 04:55	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.09	4.21
10/11/03 05:00	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.09	4.20
10/11/03 05:05	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.08	4.20
10/11/03 05:10	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.08	4.20
10/11/03 05:15	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.08	4.19
10/11/03 05:20	3.01	799.01	0.65	1.01	10.12	806.12	0.69	1.07	4.19
10/11/03 05:25	3.01	799.01	0.65	1.01	10.12	806.12	0.69	1.07	4.19
10/11/03 05:30	3.01	799.01	0.65	1.01	10.12	806.12	0.69	1.07	4.18
10/11/03 05:35	3.01	799.01	0.65	1.00	10.12	806.12	0.69	1.06	4.18

10/11/03 05:40	3.01	799.01	0.65	1.00	10.12	806.12	0.69	1.06	4.18
10/11/03 05:45	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.06	4.17
10/11/03 05:50	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.06	4.17
10/11/03 05:55	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.05	4.17
10/11/03 06:00	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.05	4.16
10/11/03 06:05	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.05	4.16
10/11/03 06:10	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.05	4.16
10/11/03 06:15	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 06:20	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 06:25	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 06:30	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 06:35	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.04	4.14
10/11/03 06:40	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/11/03 06:45	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/11/03 06:50	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/11/03 06:55	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.03	4.14
10/11/03 07:00	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.03	4.13
10/11/03 07:05	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/11/03 07:10	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/11/03 07:15	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/11/03 07:20	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/11/03 07:25	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.12
10/11/03 07:30	3.01	799.01	0.64	0.99	10.11	806.11	0.66	1.02	4.12
10/11/03 07:35	3.01	799.01	0.64	0.99	10.11	806.11	0.66	1.02	4.12
10/11/03 07:40	3.01	799.01	0.64	0.98	10.11	806.11	0.66	1.01	4.12
10/11/03 07:45	3.01	799.01	0.64	0.98	10.11	806.11	0.65	1.01	4.12
10/11/03 07:50	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.12
10/11/03 07:55	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/11/03 08:00	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/11/03 08:05	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/11/03 08:10	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/11/03 08:15	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.11
10/11/03 08:20	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.11
10/11/03 08:25	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/11/03 08:30	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/11/03 08:35	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/11/03 08:40	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/11/03 08:45	3.01	799.01	0.63	0.97	10.11	806.11	0.64	1.00	4.10
10/11/03 08:50	3.01	799.01	0.63	0.97	10.11	806.11	0.64	1.00	4.10
10/11/03 08:55	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/11/03 09:00	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/11/03 09:05	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/11/03 09:10	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/11/03 09:15	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/11/03 09:20	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.99	4.09
10/11/03 09:25	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.99	4.09
10/11/03 09:30	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.08
10/11/03 09:35	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.08
10/11/03 09:40	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.98	4.08
10/11/03 09:45	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.98	4.08
10/11/03 09:50	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.98	4.08
10/11/03 09:55	3.01	799.01	0.62	0.97	10.11	806.11	0.63	0.98	4.08
10/11/03 10:00	3.01	799.01	0.62	0.97	10.11	806.11	0.63	0.98	4.08
10/11/03 10:05	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/11/03 10:10	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/11/03 10:15	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/11/03 10:20	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/11/03 10:25	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.98	4.07
10/11/03 10:30	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.98	4.07
10/11/03 10:35	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/11/03 10:40	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/11/03 10:45	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/11/03 10:50	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.07
10/11/03 10:55	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/11/03 11:00	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/11/03 11:05	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/11/03 11:10	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/11/03 11:15	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.06

10/11/03 11:20	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.06
10/11/03 11:25	3.01	799.01	0.60	0.94	10.11	806.11	0.62	0.96	4.05
10/11/03 11:30	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/11/03 11:35	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/11/03 11:40	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/11/03 11:45	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/11/03 11:50	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/11/03 11:55	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/11/03 12:00	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/11/03 12:05	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/11/03 12:10	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/11/03 12:15	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.04
10/11/03 12:20	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.04
10/11/03 12:25	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.04
10/11/03 12:30	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.95	4.03
10/11/03 12:35	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.95	4.03
10/11/03 12:40	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/11/03 12:45	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/11/03 12:50	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/11/03 12:55	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.94	4.03
10/11/03 13:00	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.94	4.02
10/11/03 13:05	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.94	4.02
10/11/03 13:10	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.94	4.02
10/11/03 13:15	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.94	4.02
10/11/03 13:20	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/11/03 13:25	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/11/03 13:30	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/11/03 13:35	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/11/03 13:40	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/11/03 13:45	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/11/03 13:50	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/11/03 13:55	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/11/03 14:00	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.01
10/11/03 14:05	3.01	799.01	0.58	0.89	10.11	806.11	0.60	0.92	4.00
10/11/03 14:10	3.01	799.01	0.58	0.89	10.11	806.11	0.60	0.92	4.00
10/11/03 14:15	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.92	4.00
10/11/03 14:20	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.92	4.00
10/11/03 14:25	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.92	4.00
10/11/03 14:30	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.92	3.99
10/11/03 14:35	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/11/03 14:40	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/11/03 14:45	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/11/03 14:50	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/11/03 14:55	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/11/03 15:00	3.01	799.01	0.57	0.87	10.11	806.11	0.59	0.91	3.98
10/11/03 15:05	3.01	799.01	0.56	0.87	10.11	806.11	0.59	0.91	3.98
10/11/03 15:10	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.98
10/11/03 15:15	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.98
10/11/03 15:20	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/11/03 15:25	3.01	799.01	0.56	0.86	10.11	806.11	0.58	0.90	3.97
10/11/03 15:30	3.01	799.01	0.56	0.86	10.11	806.11	0.58	0.90	3.97
10/11/03 15:35	3.01	799.01	0.56	0.86	10.11	806.11	0.58	0.90	3.97
10/11/03 15:40	3.01	799.01	0.55	0.86	10.11	806.11	0.58	0.90	3.97
10/11/03 15:45	3.01	799.01	0.55	0.86	10.11	806.11	0.58	0.89	3.96
10/11/03 15:50	3.01	799.01	0.55	0.85	10.11	806.11	0.58	0.89	3.96
10/11/03 15:55	3.01	799.01	0.55	0.85	10.11	806.11	0.58	0.89	3.96
10/11/03 16:00	3.01	799.01	0.55	0.85	10.11	806.11	0.57	0.89	3.96
10/11/03 16:05	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.89	3.95
10/11/03 16:10	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.95
10/11/03 16:15	3.01	799.01	0.55	0.84	10.10	806.10	0.57	0.88	3.95
10/11/03 16:20	3.01	799.01	0.54	0.84	10.10	806.10	0.57	0.88	3.95
10/11/03 16:25	3.01	799.01	0.54	0.84	10.10	806.10	0.57	0.88	3.94
10/11/03 16:30	3.01	799.01	0.54	0.84	10.10	806.10	0.57	0.88	3.94
10/11/03 16:35	3.01	799.01	0.54	0.83	10.10	806.10	0.57	0.88	3.94
10/11/03 16:40	3.01	799.01	0.54	0.83	10.10	806.10	0.56	0.87	3.94
10/11/03 16:45	3.01	799.01	0.54	0.83	10.10	806.10	0.56	0.87	3.93
10/11/03 16:50	3.01	799.01	0.53	0.83	10.10	806.10	0.56	0.87	3.93
10/11/03 16:55	3.01	799.01	0.53	0.83	10.10	806.10	0.56	0.87	3.93

10/11/03 17:00	3.01	799.01	0.53	0.82	10.10	806.10	0.56	0.87	3.93
10/11/03 17:05	3.01	799.01	0.53	0.82	10.10	806.10	0.56	0.86	3.92
10/11/03 17:10	3.01	799.01	0.53	0.82	10.10	806.10	0.56	0.86	3.92
10/11/03 17:15	3.01	799.01	0.53	0.82	10.10	806.10	0.56	0.86	3.92
10/11/03 17:20	3.01	799.01	0.53	0.81	10.10	806.10	0.55	0.86	3.92
10/11/03 17:25	3.01	799.01	0.52	0.81	10.10	806.10	0.55	0.86	3.91
10/11/03 17:30	3.01	799.01	0.52	0.81	10.10	806.10	0.55	0.85	3.91
10/11/03 17:35	3.01	799.01	0.52	0.81	10.10	806.10	0.55	0.85	3.91
10/11/03 17:40	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.85	3.90
10/11/03 17:45	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.85	3.90
10/11/03 17:50	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.85	3.90
10/11/03 17:55	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.84	3.89
10/11/03 18:00	3.01	799.01	0.51	0.80	10.10	806.10	0.54	0.84	3.89
10/11/03 18:05	3.01	799.01	1.54	2.39	10.11	806.11	0.58	0.89	3.96
10/11/03 18:10	3.01	799.01	0.76	1.17	10.11	806.11	0.61	0.95	4.03
10/11/03 18:15	3.01	799.01	0.58	0.89	10.11	806.11	0.62	0.95	4.04
10/11/03 18:20	3.01	799.01	0.53	0.82	10.11	806.11	0.61	0.95	4.04
10/11/03 18:25	3.01	799.01	0.51	0.79	10.11	806.11	0.61	0.94	4.03
10/11/03 18:30	3.01	799.01	0.51	0.78	10.11	806.11	0.60	0.94	4.02
10/11/03 18:35	3.01	799.01	0.50	0.78	10.11	806.11	0.60	0.93	4.01
10/11/03 18:40	3.01	799.01	0.50	0.78	10.11	806.11	0.60	0.92	4.00
10/11/03 18:45	3.01	799.01	0.50	0.77	10.11	806.11	0.59	0.92	3.99
10/11/03 18:50	3.01	799.01	0.50	0.77	10.11	806.11	0.59	0.91	3.98
10/11/03 18:55	3.01	799.01	0.50	0.77	10.11	806.11	0.58	0.90	3.98
10/11/03 19:00	3.01	799.01	0.49	0.77	10.11	806.11	0.58	0.90	3.97
10/11/03 19:05	3.01	799.01	0.49	0.76	10.11	806.11	0.58	0.89	3.96
10/11/03 19:10	3.01	799.01	0.49	0.76	10.10	806.10	0.57	0.88	3.95
10/11/03 19:15	3.01	799.01	0.49	0.76	10.10	806.10	0.57	0.88	3.94
10/11/03 19:20	3.01	799.01	0.49	0.76	10.10	806.10	0.56	0.87	3.94
10/11/03 19:25	3.01	799.01	0.49	0.75	10.10	806.10	0.56	0.87	3.93
10/11/03 19:30	3.01	799.01	0.49	0.75	10.10	806.10	0.56	0.86	3.92
10/11/03 19:35	3.01	799.01	0.48	0.75	10.10	806.10	0.55	0.86	3.92
10/11/03 19:40	3.01	799.01	0.48	0.75	10.10	806.10	0.55	0.85	3.91
10/11/03 19:45	3.01	799.01	0.48	0.74	10.10	806.10	0.55	0.85	3.90
10/11/03 19:50	3.01	799.01	0.48	0.74	10.10	806.10	0.55	0.84	3.89
10/11/03 19:55	3.01	799.01	0.48	0.74	10.10	806.10	0.54	0.84	3.89
10/11/03 20:00	3.01	799.01	0.48	0.74	10.10	806.10	0.54	0.83	3.88
10/11/03 20:05	3.01	799.01	0.47	0.73	10.10	806.10	0.54	0.83	3.88
10/11/03 20:10	3.01	799.01	0.47	0.73	10.10	806.10	0.53	0.83	3.87
10/11/03 20:15	3.01	799.01	0.47	0.73	10.10	806.10	0.53	0.82	3.86
10/11/03 20:20	3.01	799.01	0.47	0.73	10.10	806.10	0.53	0.82	3.86
10/11/03 20:25	3.01	799.01	0.47	0.73	10.10	806.10	0.53	0.81	3.85
10/11/03 20:30	3.01	799.01	0.47	0.72	10.10	806.10	0.52	0.81	3.85
10/11/03 20:35	3.01	799.01	0.47	0.72	10.10	806.10	0.52	0.81	3.84
10/11/03 20:40	3.01	799.01	0.47	0.72	10.10	806.10	0.52	0.80	3.83
10/11/03 20:45	3.01	799.01	0.46	0.72	10.10	806.10	0.52	0.80	3.83
10/11/03 20:50	3.01	799.01	0.46	0.72	10.10	806.10	0.51	0.80	3.82
10/11/03 20:55	3.01	799.01	0.46	0.71	10.10	806.10	0.51	0.79	3.82
10/11/03 21:00	3.01	799.01	0.46	0.71	10.10	806.10	0.51	0.79	3.81
10/11/03 21:05	3.01	799.01	0.46	0.71	10.10	806.10	0.51	0.79	3.80
10/11/03 21:10	3.01	799.01	0.46	0.71	10.10	806.10	0.51	0.78	3.80
10/11/03 21:15	3.01	799.01	0.46	0.71	10.10	806.10	0.50	0.78	3.80
10/11/03 21:20	3.01	799.01	0.46	0.71	10.10	806.10	0.50	0.78	3.79
10/11/03 21:25	3.01	799.01	0.45	0.70	10.10	806.10	0.50	0.77	3.79
10/11/03 21:30	3.01	799.01	0.45	0.70	10.10	806.10	0.50	0.77	3.78
10/11/03 21:35	3.01	799.01	0.45	0.70	10.10	806.10	0.50	0.77	3.78
10/11/03 21:40	3.01	799.01	0.45	0.70	10.09	806.09	0.49	0.76	3.77
10/11/03 21:45	3.01	799.01	0.45	0.70	10.09	806.09	0.49	0.76	3.77
10/11/03 21:50	3.01	799.01	0.45	0.70	10.09	806.09	0.49	0.76	3.77
10/11/03 21:55	3.01	799.01	0.45	0.69	10.09	806.09	0.49	0.76	3.76
10/11/03 22:00	3.01	799.01	0.45	0.69	10.09	806.09	0.49	0.75	3.76
10/11/03 22:05	3.01	799.01	0.45	0.69	10.09	806.09	0.48	0.75	3.76
10/11/03 22:10	3.01	799.01	0.45	0.69	10.09	806.09	0.48	0.75	3.75
10/11/03 22:15	3.01	799.01	0.44	0.69	10.09	806.09	0.48	0.75	3.75
10/11/03 22:20	3.01	799.01	0.44	0.69	10.09	806.09	0.48	0.74	3.75
10/11/03 22:25	3.01	799.01	0.44	0.69	10.09	806.09	0.48	0.74	3.74
10/11/03 22:30	3.01	799.01	0.44	0.69	10.09	806.09	0.48	0.74	3.74
10/11/03 22:35	3.01	799.01	0.44	0.69	10.09	806.09	0.48	0.74	3.74

10/11/03 22:40	3.01	799.01	0.44	0.69	10.09	806.09	0.47	0.73	3.73
10/11/03 22:45	3.01	799.01	0.44	0.69	10.09	806.09	0.47	0.73	3.73
10/11/03 22:50	3.01	799.01	0.44	0.68	10.09	806.09	0.47	0.73	3.73
10/11/03 22:55	3.01	799.01	0.44	0.68	10.09	806.09	0.47	0.73	3.73
10/11/03 23:00	3.01	799.01	0.44	0.68	10.09	806.09	0.47	0.73	3.72
10/11/03 23:05	3.01	799.01	0.44	0.68	10.09	806.09	0.47	0.72	3.72
10/11/03 23:10	3.01	799.01	0.44	0.67	10.09	806.09	0.47	0.72	3.72
10/11/03 23:15	3.01	799.01	0.43	0.67	10.09	806.09	0.47	0.72	3.71
10/11/03 23:20	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.72	3.71
10/11/03 23:25	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.72	3.71
10/11/03 23:30	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.71	3.71
10/11/03 23:35	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.71	3.70
10/11/03 23:40	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.71	3.70
10/11/03 23:45	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.71	3.70
10/11/03 23:50	3.01	799.01	0.43	0.67	10.09	806.09	0.46	0.71	3.70
10/11/03 23:55	3.01	799.01	0.43	0.66	10.09	806.09	0.46	0.70	3.69
10/12/03 00:00	3.01	799.01	0.43	0.66	10.09	806.09	0.45	0.70	3.69
10/12/03 00:05	3.01	799.01	0.43	0.66	10.09	806.09	0.45	0.70	3.69
10/12/03 00:10	3.01	799.01	0.43	0.66	10.09	806.09	0.45	0.70	3.69
10/12/03 00:15	3.01	799.01	0.43	0.66	10.09	806.09	0.45	0.70	3.68
10/12/03 00:20	3.01	799.01	0.43	0.66	10.09	806.09	0.45	0.70	3.68
10/12/03 00:25	3.01	799.01	0.43	0.66	10.09	806.09	0.45	0.70	3.68
10/12/03 00:30	3.01	799.01	0.42	0.66	10.09	806.09	0.45	0.69	3.68
10/12/03 00:35	3.01	799.01	0.42	0.66	10.09	806.09	0.45	0.69	3.68
10/12/03 00:40	3.01	799.01	0.42	0.66	10.09	806.09	0.45	0.69	3.67
10/12/03 00:45	3.01	799.01	0.42	0.65	10.09	806.09	0.45	0.69	3.67
10/12/03 00:50	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.69	3.67
10/12/03 00:55	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.69	3.67
10/12/03 01:00	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.66
10/12/03 01:05	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.66
10/12/03 01:10	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.66
10/12/03 01:15	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.66
10/12/03 01:20	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.66
10/12/03 01:25	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.66
10/12/03 01:30	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.65
10/12/03 01:35	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.65
10/12/03 01:40	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.67	3.65
10/12/03 01:45	3.01	799.01	0.42	0.64	10.09	806.09	0.44	0.67	3.65
10/12/03 01:50	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.67	3.65
10/12/03 01:55	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.67	3.65
10/12/03 02:00	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.67	3.64
10/12/03 02:05	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.67	3.64
10/12/03 02:10	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.67	3.64
10/12/03 02:15	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.67	3.64
10/12/03 02:20	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.67	3.64
10/12/03 02:25	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/12/03 02:30	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/12/03 02:35	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/12/03 02:40	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/12/03 02:45	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/12/03 02:50	3.01	799.01	0.41	0.63	10.09	806.09	0.43	0.66	3.62
10/12/03 02:55	3.01	799.01	0.41	0.63	10.09	806.09	0.43	0.66	3.62
10/12/03 03:00	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.66	3.62
10/12/03 03:05	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.66	3.62
10/12/03 03:10	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.66	3.62
10/12/03 03:15	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.62
10/12/03 03:20	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/12/03 03:25	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/12/03 03:30	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/12/03 03:35	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/12/03 03:40	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/12/03 03:45	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/12/03 03:50	3.01	799.01	0.40	0.63	10.09	806.09	0.42	0.65	3.60
10/12/03 03:55	3.01	799.01	0.40	0.63	10.08	806.08	0.42	0.65	3.60
10/12/03 04:00	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.65	3.60
10/12/03 04:05	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.65	3.60
10/12/03 04:10	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.64	3.60
10/12/03 04:15	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.64	3.60

10/12/03 04:20	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.64	3.59
10/12/03 04:25	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 04:30	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 04:35	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 04:40	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 04:45	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 04:50	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 04:55	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/12/03 05:00	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/12/03 05:05	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/12/03 05:10	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 05:15	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/12/03 05:20	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/12/03 05:25	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/12/03 05:30	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/12/03 05:35	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 05:40	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 05:45	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 05:50	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 05:55	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 06:00	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 06:05	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.57
10/12/03 06:10	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.56
10/12/03 06:15	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 06:20	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 06:25	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 06:30	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 06:35	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 06:40	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/12/03 06:45	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/12/03 06:50	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/12/03 06:55	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:00	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:05	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:10	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:15	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:20	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:25	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 07:30	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.55
10/12/03 07:35	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 07:40	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 07:45	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 07:50	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 07:55	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 08:00	3.01	799.01	0.38	0.60	10.08	806.08	0.39	0.61	3.54
10/12/03 08:05	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/12/03 08:10	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/12/03 08:15	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/12/03 08:20	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 08:25	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 08:30	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 08:35	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 08:40	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 08:45	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 08:50	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/12/03 08:55	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/12/03 09:00	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/12/03 09:05	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:10	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:15	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:20	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:25	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:30	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:35	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:40	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 09:45	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/12/03 09:50	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/12/03 09:55	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51

10/12/03 10:00	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/12/03 10:05	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/12/03 10:10	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.60	3.51
10/12/03 10:15	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.60	3.51
10/12/03 10:20	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 10:25	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 10:30	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 10:35	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 10:40	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 10:45	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 10:50	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 10:55	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:00	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:05	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:10	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:15	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:20	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:25	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/12/03 11:30	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/12/03 11:35	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/12/03 11:40	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/12/03 11:45	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/12/03 11:50	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/12/03 11:55	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:00	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:05	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:10	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:15	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:20	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:25	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:30	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/12/03 12:35	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.48
10/12/03 12:40	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.48
10/12/03 12:45	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/12/03 12:50	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/12/03 12:55	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/12/03 13:00	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/12/03 13:05	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/12/03 13:10	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/12/03 13:15	3.00	799.00	0.37	0.56	10.08	806.08	0.37	0.58	3.48
10/12/03 13:20	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/12/03 13:25	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/12/03 13:30	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.47
10/12/03 13:35	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.47
10/12/03 13:40	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 13:45	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 13:50	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 13:55	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 14:00	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 14:05	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 14:10	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 14:15	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 14:20	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 14:25	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.46
10/12/03 14:30	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.46
10/12/03 14:35	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.46
10/12/03 14:40	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.46
10/12/03 14:45	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.46
10/12/03 14:50	3.01	799.01	0.39	0.60	10.08	806.08	0.37	0.57	3.46
10/12/03 14:55	3.01	799.01	0.38	0.59	10.08	806.08	0.37	0.57	3.46
10/12/03 15:00	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.57	3.47
10/12/03 15:05	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/12/03 15:10	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.46
10/12/03 15:15	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:20	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:25	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:30	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:35	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46

10/12/03 15:40	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:45	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:50	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/12/03 15:55	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.56	3.45
10/12/03 16:00	3.00	799.00	0.36	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:05	3.00	799.00	0.36	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:10	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:15	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:20	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:25	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:30	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:35	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:40	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/12/03 16:45	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.44
10/12/03 16:50	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.44
10/12/03 16:55	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:00	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:05	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:10	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:15	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:20	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:25	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/12/03 17:30	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.44
10/12/03 17:35	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 17:40	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 17:45	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 17:50	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 17:55	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 18:00	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 18:05	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 18:10	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 18:15	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 18:20	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/12/03 18:25	3.00	799.00	0.35	0.54	10.08	806.08	0.35	0.55	3.43
10/12/03 18:30	3.00	799.00	0.35	0.54	10.08	806.08	0.35	0.55	3.42
10/12/03 18:35	3.00	799.00	0.35	0.54	10.08	806.08	0.35	0.55	3.42
10/12/03 18:40	3.00	799.00	0.35	0.54	10.08	806.08	0.35	0.55	3.42
10/12/03 18:45	3.00	799.00	0.35	0.53	10.08	806.08	0.35	0.55	3.42
10/12/03 18:50	3.00	799.00	0.35	0.53	10.08	806.08	0.35	0.55	3.42
10/12/03 18:55	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/12/03 19:00	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/12/03 19:05	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/12/03 19:10	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/12/03 19:15	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/12/03 19:20	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/12/03 19:25	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 19:30	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 19:35	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 19:40	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 19:45	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 19:50	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 19:55	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 20:00	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 20:05	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 20:10	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 20:15	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/12/03 20:20	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.40
10/12/03 20:25	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.40
10/12/03 20:30	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/12/03 20:35	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/12/03 20:40	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/12/03 20:45	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.54	3.40
10/12/03 20:50	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.54	3.40
10/12/03 20:55	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.53	3.40
10/12/03 21:00	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.53	3.40
10/12/03 21:05	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.40
10/12/03 21:10	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.40
10/12/03 21:15	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.39

10/12/03 21:20	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:25	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:30	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:35	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:40	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:45	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:50	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 21:55	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 22:00	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 22:05	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/12/03 22:10	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.38
10/12/03 22:15	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/12/03 22:20	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/12/03 22:25	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/12/03 22:30	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/12/03 22:35	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/12/03 22:40	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/12/03 22:45	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/12/03 22:50	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/12/03 22:55	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/12/03 23:00	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/12/03 23:05	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:10	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:15	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:20	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:25	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:30	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:35	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:40	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:45	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/12/03 23:50	3.00	799.00	0.33	0.51	10.07	806.07	0.33	0.52	3.37
10/12/03 23:55	3.00	799.00	0.33	0.51	10.07	806.07	0.33	0.52	3.37
10/13/03 00:00	3.00	799.00	0.33	0.51	10.07	806.07	0.33	0.52	3.36
10/13/03 00:05	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 00:10	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 00:15	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 00:20	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 00:25	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 00:30	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 00:35	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 00:40	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 00:45	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 00:50	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 00:55	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:00	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:05	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:10	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:15	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:20	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:25	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:30	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:35	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:40	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:45	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 01:50	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.34
10/13/03 01:55	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 02:00	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 02:05	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 02:10	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 02:15	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 02:20	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 02:25	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 02:30	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 02:35	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 02:40	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.34
10/13/03 02:45	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 02:50	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 02:55	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33

10/13/03 03:00	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:05	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:10	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:15	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:20	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:25	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:30	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:35	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:40	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 03:45	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 03:50	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 03:55	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 04:00	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 04:05	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:10	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:15	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:20	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:25	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:30	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:35	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 04:40	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 04:45	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 04:50	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 04:55	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:00	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:05	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:10	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:15	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:20	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:25	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 05:30	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.31
10/13/03 05:35	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 05:40	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 05:45	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 05:50	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 05:55	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:00	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:05	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:10	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:15	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:20	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:25	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 06:30	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 06:35	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 06:40	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 06:45	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 06:50	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 06:55	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 07:00	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 07:05	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 07:10	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 07:15	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 07:20	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.29
10/13/03 07:25	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 07:30	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 07:35	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 07:40	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 07:45	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 07:50	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 07:55	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 08:00	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 08:05	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 08:10	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 08:15	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 08:20	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 08:25	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 08:30	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 08:35	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27

10/13/03 08:40	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 08:45	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 08:50	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 08:55	3.00	799.00	0.29	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 09:00	3.00	799.00	0.29	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 09:05	3.00	799.00	0.29	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 09:10	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.27
10/13/03 09:15	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 09:20	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 09:25	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 09:30	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 09:35	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 09:40	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 09:45	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 09:50	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 09:55	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 10:00	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 10:05	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 10:10	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:15	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:20	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:25	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:30	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:35	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:40	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:45	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:50	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 10:55	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 11:00	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.24
10/13/03 11:05	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.24
10/13/03 11:10	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.46	3.24
10/13/03 11:15	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.46	3.24
10/13/03 11:20	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.46	3.24
10/13/03 11:25	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 11:30	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 11:35	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 11:40	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 11:45	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 11:50	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 11:55	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:00	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:05	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:10	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:15	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:20	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:25	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:30	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:35	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:40	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:45	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 12:50	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 12:55	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 13:00	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 13:05	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 13:10	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 13:15	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 13:20	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 13:25	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 13:30	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 13:35	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 13:40	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 13:45	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.21
10/13/03 13:50	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.21
10/13/03 13:55	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.21
10/13/03 14:00	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 14:05	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 14:10	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 14:15	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21

10/13/03 14:20	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 14:25	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 14:30	3.00	799.00	0.27	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 14:35	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 14:40	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 14:45	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 14:50	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 14:55	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 15:00	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 15:05	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.43	3.20
10/13/03 15:10	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.43	3.20
10/13/03 15:15	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.43	3.20
10/13/03 15:20	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.43	3.20
10/13/03 15:25	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.43	3.20
10/13/03 15:30	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.43	3.19
10/13/03 15:35	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 15:40	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 15:45	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 15:50	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 15:55	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 16:00	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 16:05	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:10	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:15	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:20	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:25	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:30	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:35	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:40	3.00	799.00	0.28	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:45	3.00	799.00	0.27	0.43	10.06	806.06	0.28	0.43	3.19
10/13/03 16:50	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 16:55	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 17:00	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 17:05	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 17:10	3.00	799.00	0.27	0.42	10.06	806.06	0.28	0.43	3.19
10/13/03 17:15	3.00	799.00	0.27	0.41	10.06	806.06	0.28	0.43	3.18
10/13/03 17:20	3.00	799.00	0.27	0.41	10.06	806.06	0.28	0.43	3.18
10/13/03 17:25	3.00	799.00	0.27	0.41	10.06	806.06	0.28	0.43	3.18
10/13/03 17:30	3.00	799.00	0.27	0.41	10.06	806.06	0.28	0.43	3.18
10/13/03 17:35	3.00	799.00	0.26	0.41	10.06	806.06	0.28	0.43	3.18
10/13/03 17:40	3.00	799.00	0.26	0.41	10.06	806.06	0.27	0.43	3.18
10/13/03 17:45	3.00	799.00	0.26	0.41	10.06	806.06	0.27	0.42	3.18
10/13/03 17:50	3.00	799.00	0.26	0.41	10.06	806.06	0.27	0.42	3.18
10/13/03 17:55	3.00	799.00	0.26	0.41	10.06	806.06	0.27	0.42	3.18
10/13/03 18:00	3.00	799.00	0.26	0.41	10.06	806.06	0.27	0.42	3.17
10/13/03 18:05	3.00	799.00	0.26	0.41	10.06	806.06	0.27	0.42	3.17
10/13/03 18:10	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.17
10/13/03 18:15	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.17
10/13/03 18:20	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.17
10/13/03 18:25	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.17
10/13/03 18:30	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.17
10/13/03 18:35	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.17
10/13/03 18:40	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.16
10/13/03 18:45	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.16
10/13/03 18:50	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.16
10/13/03 18:55	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.16
10/13/03 19:00	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.16
10/13/03 19:05	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.42	3.16
10/13/03 19:10	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.16
10/13/03 19:15	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.16
10/13/03 19:20	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:25	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:30	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:35	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:40	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:45	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:50	3.00	799.00	0.26	0.40	10.06	806.06	0.27	0.41	3.15
10/13/03 19:55	3.00	799.00	0.26	0.40	10.06	806.06	0.26	0.41	3.15

10/13/03 20:00	3.00	799.00	0.26	0.39	10.06	806.06	0.26	0.41	3.15
10/13/03 20:05	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:10	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:15	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:20	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:25	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:30	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:35	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:40	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.41	3.14
10/13/03 20:45	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.14
10/13/03 20:50	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.14
10/13/03 20:55	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:00	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:05	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:10	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:15	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:20	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:25	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:30	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:35	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.13
10/13/03 21:40	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.12
10/13/03 21:45	3.00	799.00	0.25	0.39	10.06	806.06	0.26	0.40	3.12
10/13/03 21:50	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 21:55	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:00	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:05	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:10	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:15	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:20	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:25	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.40	3.12
10/13/03 22:30	3.00	799.00	0.25	0.38	10.06	806.06	0.26	0.39	3.11
10/13/03 22:35	3.00	799.00	0.25	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 22:40	3.00	799.00	0.25	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 22:45	3.00	799.00	0.25	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 22:50	3.00	799.00	0.25	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 22:55	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 23:00	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 23:05	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 23:10	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.11
10/13/03 23:15	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.10
10/13/03 23:20	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.10
10/13/03 23:25	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.10
10/13/03 23:30	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.10
10/13/03 23:35	3.00	799.00	0.24	0.38	10.06	806.06	0.25	0.39	3.10
10/13/03 23:40	3.00	799.00	0.24	0.37	10.06	806.06	0.25	0.39	3.10
10/13/03 23:45	3.00	799.00	0.24	0.37	10.06	806.06	0.25	0.39	3.10
10/13/03 23:50	3.00	799.00	0.24	0.37	10.06	806.06	0.25	0.39	3.10
10/13/03 23:55	3.00	799.00	0.24	0.37	10.06	806.06	0.25	0.39	3.10
10/14/03 00:00	3.00	799.00	0.24	0.37	10.06	806.06	0.25	0.39	3.10

	4MR Core Project Alterantive - 2-Year, 24-Hour Design Storm (711 and 733 Mon River Stage)								
	PHL Forebay		PHL Forebay Weir		Panther Hollow Lake		PHL Underflow Pipe		
Maximums	3.1	799.1	50.6	78.3	12.0	808.0	23.2	35.8	9.5
Date/Time	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Velocity (fps)
10/07/03 00:05	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:10	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:15	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:20	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:25	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:30	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:35	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:40	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:45	2.01	798.01	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:50	2.02	798.02	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:55	2.03	798.03	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:00	2.04	798.04	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:05	2.05	798.05	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:10	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:15	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:20	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:25	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:30	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:35	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:40	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:45	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:50	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:55	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:00	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:05	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:10	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:15	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:20	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:25	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:30	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:35	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:40	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:45	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:50	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:55	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:00	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:05	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:10	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:15	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:20	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:25	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:30	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:35	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:40	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:45	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:50	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:55	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:00	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:05	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:10	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:20	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:25	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:30	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:35	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:40	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:45	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:50	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:55	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:00	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:05	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:10	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 05:20	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:25	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:30	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:35	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:40	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:45	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:50	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:55	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:00	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:05	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:10	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:15	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:20	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:25	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:30	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:35	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:40	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:45	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:50	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:55	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:00	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:05	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:10	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:15	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:20	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:25	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:30	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:35	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:40	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:45	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:50	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:55	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:00	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:05	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:10	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:15	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:20	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:25	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:30	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:35	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:40	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:45	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:50	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:55	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:00	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:05	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:10	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:15	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:20	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:25	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:30	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:35	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:40	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:45	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:50	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:55	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:00	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:05	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:10	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:15	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:20	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:25	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:30	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:35	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:40	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:45	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:50	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:55	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 11:00	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:05	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:10	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:15	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:20	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:25	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:30	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:35	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:40	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:45	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:50	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:55	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:00	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:05	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:10	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:15	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:20	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:25	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:30	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:35	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:40	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:45	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:50	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:55	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:00	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:05	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:10	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:15	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:20	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:25	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:30	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:35	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:40	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:45	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:50	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:55	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:00	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:05	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:10	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:15	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:20	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:25	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:30	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:35	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:40	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:45	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:50	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:55	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:00	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:05	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:10	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:15	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:20	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:25	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:30	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:35	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:40	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:45	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:50	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:55	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:00	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:05	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:10	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:15	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:20	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:25	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:30	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:35	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 16:40	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:45	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:50	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:55	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:00	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:05	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:10	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:15	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:20	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:25	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:30	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:35	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:40	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:45	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:50	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:55	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:00	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:05	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:10	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:15	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:20	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:25	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:30	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:35	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:40	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:45	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:50	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:55	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:00	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:05	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:10	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:15	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:20	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:25	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:30	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:35	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:40	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:45	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:50	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:55	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:00	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:05	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:10	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:15	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:20	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:25	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:30	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:35	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:40	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:45	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:50	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:55	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:00	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:05	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:10	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:15	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:20	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:25	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:30	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:35	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:40	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:45	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:50	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:55	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:00	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:05	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:10	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:15	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 22:20	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:25	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:30	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:35	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:40	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:45	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:50	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:55	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:00	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:05	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:10	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:15	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:20	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:25	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:30	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:35	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:40	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:45	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:50	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:55	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:00	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:05	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:10	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:15	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:20	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:25	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:30	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:35	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:40	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:45	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:50	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:55	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:00	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:05	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:10	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:15	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:20	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:25	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:30	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:35	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:40	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:45	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:50	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:55	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:00	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:05	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:10	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:15	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:20	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:25	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:30	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:35	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:40	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:45	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:50	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:55	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:00	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:05	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:10	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:15	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:20	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:25	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:30	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:35	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:40	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:45	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:50	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:55	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 04:00	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:05	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:10	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:15	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:20	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:25	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:30	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:35	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:40	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:45	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:50	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:55	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:00	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:05	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:10	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:15	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:20	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:25	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:30	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:35	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:40	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:45	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:50	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:55	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:00	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:05	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:10	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:15	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:20	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:25	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:30	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:35	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:40	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:45	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:50	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:55	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:00	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:05	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:10	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:15	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:20	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:25	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:30	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:35	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:40	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:45	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:50	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:55	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:00	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:05	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:10	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:15	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:20	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:25	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:30	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:35	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:40	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:45	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:50	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:55	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:00	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:05	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:10	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:15	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:20	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:25	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:30	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:35	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 09:40	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:45	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:50	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:55	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:00	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:05	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:10	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:15	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:20	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:25	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:30	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:35	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:40	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:45	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:50	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:55	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:00	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:05	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:10	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:15	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:20	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:25	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:30	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:35	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:40	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:45	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:50	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:55	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:00	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:05	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:10	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:15	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:20	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:25	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:30	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:35	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:40	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:45	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:50	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:55	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:00	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:05	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:10	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:15	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:20	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:25	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:30	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:35	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:40	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:45	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:50	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:55	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:00	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:05	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:10	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:15	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:20	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:25	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:30	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:35	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:40	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:45	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:50	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:55	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:00	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:05	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:10	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:15	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 15:20	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:25	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:30	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:35	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:40	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:45	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:50	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:55	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:00	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:05	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:10	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:15	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:20	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:25	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:30	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:35	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:40	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:45	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:50	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:55	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:00	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:05	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:10	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:15	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:20	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:25	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:30	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:35	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:40	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:45	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:50	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:55	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:00	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:05	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:10	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:15	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:20	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:25	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:30	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:35	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:40	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:45	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:50	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:55	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:00	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:05	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:10	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:15	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:20	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:25	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:30	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:35	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:40	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:45	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:50	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:55	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:00	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:05	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:10	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:15	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:20	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:25	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:30	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:35	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:40	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:45	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:50	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:55	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 21:00	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:05	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:10	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:15	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:20	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:25	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:30	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:35	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:40	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:45	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:50	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:55	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:00	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:05	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:10	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:15	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:20	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:25	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:30	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:35	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:40	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:45	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:50	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:55	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:00	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:05	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:10	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:15	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:20	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:25	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:30	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:35	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:40	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/08/03 23:45	3.00	799.00	0.05	0.08	10.00	806.00	0.00	0.00	0.00
10/08/03 23:50	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/08/03 23:55	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/09/03 00:00	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:05	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:10	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:15	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:20	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:25	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	1.20
10/09/03 00:30	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.25
10/09/03 00:35	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.30
10/09/03 00:40	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.35
10/09/03 00:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.39
10/09/03 00:50	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.43
10/09/03 00:55	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.46
10/09/03 01:00	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.49
10/09/03 01:05	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.52
10/09/03 01:10	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.55
10/09/03 01:15	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.57
10/09/03 01:20	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.59
10/09/03 01:25	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.62
10/09/03 01:30	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.63
10/09/03 01:35	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.65
10/09/03 01:40	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.67
10/09/03 01:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.68
10/09/03 01:50	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.02	1.70
10/09/03 01:55	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.71
10/09/03 02:00	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.72
10/09/03 02:05	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.73
10/09/03 02:10	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.74
10/09/03 02:15	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.75
10/09/03 02:20	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.76
10/09/03 02:25	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:30	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:35	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.78

10/09/03 02:40	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.79
10/09/03 02:45	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.79
10/09/03 02:50	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 02:55	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 03:00	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:05	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:10	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.81
10/09/03 03:15	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.80
10/09/03 03:20	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:25	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:30	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:35	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:40	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:45	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.05	1.80
10/09/03 03:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:05	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:10	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:15	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:20	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:25	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:30	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:35	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.81
10/09/03 04:40	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:45	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.83
10/09/03 04:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.84
10/09/03 05:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.85
10/09/03 05:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.85
10/09/03 05:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.86
10/09/03 05:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.87
10/09/03 05:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.89
10/09/03 05:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:40	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:45	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:50	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:55	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.92
10/09/03 06:00	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 06:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 07:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.03
10/09/03 08:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04

10/09/03 08:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:15	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:20	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:25	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:30	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:35	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:40	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:45	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.08
10/09/03 09:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.10
10/09/03 10:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14

10/09/03 14:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.15
10/09/03 17:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16

10/09/03 19:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 21:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16

10/10/03 01:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 02:20	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 02:25	3.00	799.00	0.09	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 02:30	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.18
10/10/03 02:35	3.00	799.00	0.10	0.15	10.03	806.03	0.08	0.12	2.18
10/10/03 02:40	3.00	799.00	0.10	0.16	10.03	806.03	0.08	0.12	2.19
10/10/03 02:45	3.00	799.00	0.11	0.17	10.03	806.03	0.08	0.12	2.20
10/10/03 02:50	3.00	799.00	0.12	0.18	10.03	806.03	0.08	0.12	2.21
10/10/03 02:55	3.00	799.00	0.12	0.19	10.03	806.03	0.08	0.13	2.22
10/10/03 03:00	3.00	799.00	0.13	0.19	10.03	806.03	0.08	0.13	2.23
10/10/03 03:05	3.00	799.00	0.13	0.20	10.03	806.03	0.08	0.13	2.24
10/10/03 03:10	3.00	799.00	0.13	0.20	10.03	806.03	0.09	0.13	2.25
10/10/03 03:15	3.00	799.00	0.13	0.21	10.03	806.03	0.09	0.14	2.27
10/10/03 03:20	3.00	799.00	0.14	0.21	10.03	806.03	0.09	0.14	2.28
10/10/03 03:25	3.00	799.00	0.14	0.22	10.03	806.03	0.09	0.14	2.29
10/10/03 03:30	3.00	799.00	0.14	0.22	10.03	806.03	0.09	0.14	2.30
10/10/03 03:35	3.00	799.00	0.15	0.23	10.03	806.03	0.09	0.15	2.32
10/10/03 03:40	3.00	799.00	0.15	0.23	10.03	806.03	0.10	0.15	2.33
10/10/03 03:45	3.00	799.00	0.15	0.24	10.03	806.03	0.10	0.15	2.34
10/10/03 03:50	3.00	799.00	0.16	0.24	10.03	806.03	0.10	0.15	2.36
10/10/03 03:55	3.00	799.00	0.16	0.25	10.03	806.03	0.10	0.16	2.37
10/10/03 04:00	3.00	799.00	0.16	0.25	10.03	806.03	0.10	0.16	2.38
10/10/03 04:05	3.00	799.00	0.17	0.26	10.03	806.03	0.11	0.16	2.39
10/10/03 04:10	3.00	799.00	0.17	0.27	10.03	806.03	0.11	0.17	2.41
10/10/03 04:15	3.00	799.00	0.18	0.28	10.04	806.04	0.11	0.17	2.42
10/10/03 04:20	3.00	799.00	0.18	0.28	10.04	806.04	0.11	0.17	2.44
10/10/03 04:25	3.00	799.00	0.19	0.29	10.04	806.04	0.12	0.18	2.45
10/10/03 04:30	3.00	799.00	0.19	0.30	10.04	806.04	0.12	0.18	2.47
10/10/03 04:35	3.00	799.00	0.20	0.31	10.04	806.04	0.12	0.19	2.48
10/10/03 04:40	3.00	799.00	0.20	0.31	10.04	806.04	0.12	0.19	2.50
10/10/03 04:45	3.00	799.00	0.21	0.32	10.04	806.04	0.13	0.20	2.51
10/10/03 04:50	3.00	799.00	0.21	0.33	10.04	806.04	0.13	0.20	2.53
10/10/03 04:55	3.00	799.00	0.22	0.33	10.04	806.04	0.13	0.20	2.54
10/10/03 05:00	3.00	799.00	0.22	0.34	10.04	806.04	0.13	0.21	2.56
10/10/03 05:05	3.00	799.00	0.22	0.35	10.04	806.04	0.14	0.21	2.58
10/10/03 05:10	3.00	799.00	0.23	0.35	10.04	806.04	0.14	0.22	2.59
10/10/03 05:15	3.00	799.00	0.23	0.36	10.04	806.04	0.14	0.22	2.61
10/10/03 05:20	3.00	799.00	0.23	0.36	10.04	806.04	0.15	0.23	2.63
10/10/03 05:25	3.00	799.00	0.24	0.37	10.04	806.04	0.15	0.23	2.64
10/10/03 05:30	3.00	799.00	0.24	0.37	10.04	806.04	0.15	0.24	2.66
10/10/03 05:35	3.00	799.00	0.24	0.38	10.04	806.04	0.16	0.24	2.68
10/10/03 05:40	3.00	799.00	0.25	0.38	10.05	806.05	0.16	0.25	2.69
10/10/03 05:45	3.00	799.00	0.25	0.38	10.05	806.05	0.16	0.25	2.71
10/10/03 05:50	3.00	799.00	0.25	0.39	10.05	806.05	0.17	0.26	2.73
10/10/03 05:55	3.00	799.00	0.25	0.39	10.05	806.05	0.17	0.26	2.74
10/10/03 06:00	3.00	799.00	0.26	0.40	10.05	806.05	0.17	0.27	2.76
10/10/03 06:05	3.00	799.00	0.26	0.41	10.05	806.05	0.18	0.27	2.78
10/10/03 06:10	3.00	799.00	0.27	0.41	10.05	806.05	0.18	0.28	2.79
10/10/03 06:15	3.00	799.00	0.27	0.42	10.05	806.05	0.18	0.28	2.81
10/10/03 06:20	3.00	799.00	0.28	0.43	10.05	806.05	0.19	0.29	2.83
10/10/03 06:25	3.00	799.00	0.28	0.44	10.05	806.05	0.19	0.30	2.84
10/10/03 06:30	3.00	799.00	0.29	0.44	10.05	806.05	0.19	0.30	2.86
10/10/03 06:35	3.00	799.00	0.29	0.45	10.05	806.05	0.20	0.31	2.88
10/10/03 06:40	3.00	799.00	0.30	0.46	10.05	806.05	0.20	0.31	2.90
10/10/03 06:45	3.00	799.00	0.30	0.47	10.05	806.05	0.21	0.32	2.92
10/10/03 06:50	3.00	799.00	0.31	0.48	10.05	806.05	0.21	0.33	2.93
10/10/03 06:55	3.00	799.00	0.32	0.49	10.05	806.05	0.21	0.33	2.95

10/10/03 07:00	3.00	799.00	0.32	0.50	10.06	806.06	0.22	0.34	2.97
10/10/03 07:05	3.00	799.00	0.33	0.51	10.06	806.06	0.22	0.34	2.99
10/10/03 07:10	3.00	799.00	0.34	0.52	10.06	806.06	0.23	0.35	3.01
10/10/03 07:15	3.00	799.00	0.34	0.53	10.06	806.06	0.23	0.36	3.03
10/10/03 07:20	3.00	799.00	0.35	0.54	10.06	806.06	0.24	0.37	3.05
10/10/03 07:25	3.00	799.00	0.36	0.55	10.06	806.06	0.24	0.37	3.07
10/10/03 07:30	3.00	799.00	0.36	0.56	10.06	806.06	0.25	0.38	3.09
10/10/03 07:35	3.00	799.00	0.37	0.57	10.06	806.06	0.25	0.39	3.11
10/10/03 07:40	3.00	799.00	0.37	0.58	10.06	806.06	0.26	0.40	3.12
10/10/03 07:45	3.00	799.00	0.38	0.59	10.06	806.06	0.26	0.41	3.14
10/10/03 07:50	3.01	799.01	0.38	0.59	10.06	806.06	0.27	0.42	3.16
10/10/03 07:55	3.01	799.01	0.39	0.60	10.06	806.06	0.27	0.42	3.17
10/10/03 08:00	3.01	799.01	0.39	0.60	10.07	806.07	0.28	0.43	3.19
10/10/03 08:05	3.01	799.01	0.40	0.61	10.07	806.07	0.28	0.44	3.21
10/10/03 08:10	3.01	799.01	0.40	0.62	10.07	806.07	0.29	0.45	3.23
10/10/03 08:15	3.01	799.01	0.41	0.63	10.07	806.07	0.30	0.46	3.24
10/10/03 08:20	3.01	799.01	0.41	0.64	10.07	806.07	0.30	0.47	3.26
10/10/03 08:25	3.01	799.01	0.42	0.65	10.07	806.07	0.31	0.47	3.28
10/10/03 08:30	3.01	799.01	0.43	0.66	10.07	806.07	0.31	0.48	3.30
10/10/03 08:35	3.01	799.01	0.43	0.67	10.07	806.07	0.32	0.49	3.31
10/10/03 08:40	3.01	799.01	0.44	0.68	10.07	806.07	0.32	0.50	3.33
10/10/03 08:45	3.01	799.01	0.44	0.69	10.07	806.07	0.33	0.51	3.35
10/10/03 08:50	3.01	799.01	0.45	0.70	10.07	806.07	0.34	0.52	3.37
10/10/03 08:55	3.01	799.01	0.46	0.71	10.07	806.07	0.34	0.53	3.39
10/10/03 09:00	3.01	799.01	0.47	0.72	10.08	806.08	0.35	0.54	3.40
10/10/03 09:05	3.01	799.01	0.48	0.74	10.08	806.08	0.35	0.55	3.42
10/10/03 09:10	3.01	799.01	0.49	0.75	10.08	806.08	0.36	0.56	3.44
10/10/03 09:15	3.01	799.01	0.50	0.77	10.08	806.08	0.37	0.57	3.46
10/10/03 09:20	3.01	799.01	0.51	0.79	10.08	806.08	0.37	0.58	3.48
10/10/03 09:25	3.01	799.01	0.53	0.81	10.08	806.08	0.38	0.59	3.50
10/10/03 09:30	3.01	799.01	0.54	0.83	10.08	806.08	0.39	0.60	3.52
10/10/03 09:35	3.01	799.01	0.55	0.86	10.08	806.08	0.40	0.62	3.55
10/10/03 09:40	3.01	799.01	0.57	0.88	10.08	806.08	0.41	0.63	3.57
10/10/03 09:45	3.01	799.01	0.58	0.89	10.09	806.09	0.42	0.64	3.59
10/10/03 09:50	3.01	799.01	0.58	0.90	10.09	806.09	0.42	0.66	3.62
10/10/03 09:55	3.01	799.01	0.62	0.95	10.09	806.09	0.43	0.67	3.64
10/10/03 10:00	3.01	799.01	0.64	0.99	10.09	806.09	0.44	0.69	3.67
10/10/03 10:05	3.01	799.01	0.66	1.03	10.09	806.09	0.45	0.70	3.69
10/10/03 10:10	3.01	799.01	0.69	1.06	10.09	806.09	0.47	0.72	3.71
10/10/03 10:15	3.01	799.01	0.71	1.10	10.09	806.09	0.48	0.74	3.74
10/10/03 10:20	3.01	799.01	0.73	1.14	10.10	806.10	0.49	0.76	3.77
10/10/03 10:25	3.01	799.01	0.76	1.17	10.10	806.10	0.51	0.78	3.80
10/10/03 10:30	3.01	799.01	0.78	1.20	10.10	806.10	0.52	0.80	3.83
10/10/03 10:35	3.01	799.01	0.81	1.26	10.10	806.10	0.53	0.83	3.87
10/10/03 10:40	3.01	799.01	0.85	1.31	10.10	806.10	0.55	0.85	3.91
10/10/03 10:45	3.01	799.01	0.88	1.36	10.11	806.11	0.57	0.88	3.94
10/10/03 10:50	3.01	799.01	0.91	1.41	10.11	806.11	0.59	0.91	3.98
10/10/03 10:55	3.01	799.01	0.94	1.46	10.11	806.11	0.61	0.94	4.02
10/10/03 11:00	3.01	799.01	0.97	1.51	10.11	806.11	0.63	0.97	4.06
10/10/03 11:05	3.01	799.01	1.04	1.61	10.11	806.11	0.65	1.00	4.11
10/10/03 11:10	3.01	799.01	1.10	1.70	10.12	806.12	0.68	1.05	4.16
10/10/03 11:15	3.01	799.01	1.13	1.75	10.12	806.12	0.70	1.09	4.20
10/10/03 11:20	3.01	799.01	1.19	1.85	10.12	806.12	0.73	1.13	4.25
10/10/03 11:25	3.01	799.01	1.27	1.96	10.13	806.13	0.76	1.18	4.29
10/10/03 11:30	3.01	799.01	1.33	2.06	10.13	806.13	0.80	1.23	4.34
10/10/03 11:35	3.01	799.01	1.66	2.57	10.14	806.14	0.84	1.30	4.40
10/10/03 11:40	3.01	799.01	1.97	3.04	10.15	806.15	0.91	1.41	4.50
10/10/03 11:45	3.02	799.02	2.22	3.44	10.15	806.15	1.00	1.54	4.63
10/10/03 11:50	3.03	799.03	4.53	7.01	10.18	806.18	1.17	1.82	4.83
10/10/03 11:55	3.04	799.04	8.17	12.65	10.21	806.21	1.54	2.39	5.21
10/10/03 12:00	3.06	799.06	15.27	23.63	10.28	806.28	2.23	3.45	5.75
10/10/03 12:05	3.06	799.06	17.77	27.49	10.36	806.36	3.40	5.26	6.41
10/10/03 12:10	3.09	799.09	27.87	43.12	10.47	806.47	5.06	7.83	7.07
10/10/03 12:15	3.11	799.11	41.70	64.52	10.59	806.59	7.07	10.95	7.65
10/10/03 12:20	3.13	799.13	50.61	78.30	10.80	806.80	11.33	17.53	8.48
10/10/03 12:25	3.13	799.13	50.37	77.93	11.00	807.00	16.07	24.87	9.11
10/10/03 12:30	3.13	799.13	49.55	76.67	11.17	807.17	17.72	27.41	9.30
10/10/03 12:35	3.13	799.13	47.57	73.61	11.33	807.33	18.93	29.29	9.41

10/10/03 12:40	3.12	799.12	43.36	67.08	11.47	807.47	19.91	30.81	9.49
10/10/03 12:45	3.11	799.11	40.33	62.40	11.58	807.58	20.72	32.06	9.48
10/10/03 12:50	3.11	799.11	37.75	58.41	11.67	807.67	21.34	33.02	9.35
10/10/03 12:55	3.10	799.10	35.41	54.79	11.75	807.75	21.85	33.80	9.25
10/10/03 13:00	3.10	799.10	32.81	50.77	11.81	807.81	22.25	34.43	9.16
10/10/03 13:05	3.09	799.09	30.28	46.85	11.86	807.86	22.56	34.90	9.09
10/10/03 13:10	3.09	799.09	28.21	43.64	11.90	807.90	22.79	35.26	9.04
10/10/03 13:15	3.08	799.08	26.40	40.84	11.93	807.93	22.95	35.51	9.00
10/10/03 13:20	3.08	799.08	24.87	38.47	11.94	807.94	23.06	35.68	8.97
10/10/03 13:25	3.08	799.08	23.62	36.54	11.95	807.95	23.13	35.78	8.96
10/10/03 13:30	3.08	799.08	22.49	34.80	11.96	807.96	23.16	35.83	8.95
10/10/03 13:35	3.07	799.07	21.33	33.01	11.96	807.96	23.15	35.83	8.95
10/10/03 13:40	3.07	799.07	20.34	31.47	11.95	807.95	23.12	35.77	8.96
10/10/03 13:45	3.07	799.07	19.36	29.95	11.94	807.94	23.06	35.67	8.97
10/10/03 13:50	3.07	799.07	18.45	28.55	11.92	807.92	22.97	35.54	8.99
10/10/03 13:55	3.06	799.06	17.62	27.26	11.91	807.91	22.86	35.37	9.01
10/10/03 14:00	3.06	799.06	16.91	26.16	11.88	807.88	22.73	35.16	9.04
10/10/03 14:05	3.06	799.06	16.26	25.16	11.86	807.86	22.58	34.93	9.08
10/10/03 14:10	3.06	799.06	15.63	24.19	11.83	807.83	22.41	34.67	9.11
10/10/03 14:15	3.06	799.06	14.85	22.98	11.80	807.80	22.22	34.38	9.16
10/10/03 14:20	3.05	799.05	13.62	21.07	11.76	807.76	22.01	34.06	9.20
10/10/03 14:25	3.05	799.05	12.67	19.60	11.73	807.73	21.77	33.68	9.24
10/10/03 14:30	3.05	799.05	11.76	18.20	11.68	807.68	21.50	33.27	9.30
10/10/03 14:35	3.05	799.05	11.15	17.25	11.64	807.64	21.22	32.83	9.35
10/10/03 14:40	3.05	799.05	10.61	16.42	11.59	807.59	20.91	32.36	9.41
10/10/03 14:45	3.04	799.04	10.10	15.63	11.54	807.54	20.60	31.87	9.47
10/10/03 14:50	3.04	799.04	9.63	14.91	11.49	807.49	20.28	31.37	9.53
10/10/03 14:55	3.04	799.04	9.23	14.28	11.44	807.44	19.95	30.86	9.51
10/10/03 15:00	3.04	799.04	8.89	13.75	11.39	807.39	19.60	30.32	9.48
10/10/03 15:05	3.04	799.04	8.57	13.25	11.34	807.34	19.24	29.77	9.45
10/10/03 15:10	3.04	799.04	8.22	12.72	11.29	807.29	18.87	29.20	9.42
10/10/03 15:15	3.04	799.04	7.88	12.19	11.24	807.24	18.50	28.63	9.39
10/10/03 15:20	3.04	799.04	7.59	11.74	11.19	807.19	18.12	28.04	9.35
10/10/03 15:25	3.04	799.04	7.34	11.35	11.14	807.14	17.73	27.44	9.32
10/10/03 15:30	3.04	799.04	7.12	11.01	11.09	807.09	17.34	26.83	9.28
10/10/03 15:35	3.03	799.03	6.90	10.68	11.04	807.04	16.95	26.22	9.24
10/10/03 15:40	3.03	799.03	6.70	10.37	10.99	806.99	16.55	25.60	9.20
10/10/03 15:45	3.03	799.03	6.51	10.08	10.95	806.95	15.68	24.26	9.11
10/10/03 15:50	3.03	799.03	6.34	9.80	10.90	806.90	14.63	22.63	8.99
10/10/03 15:55	3.03	799.03	6.18	9.56	10.86	806.86	13.69	21.19	8.88
10/10/03 16:00	3.03	799.03	6.10	9.43	10.83	806.83	12.87	19.91	8.77
10/10/03 16:05	3.03	799.03	5.89	9.12	10.80	806.80	12.13	18.77	8.66
10/10/03 16:10	3.03	799.03	5.69	8.81	10.77	806.77	11.47	17.74	8.56
10/10/03 16:15	3.03	799.03	5.54	8.57	10.74	806.74	10.87	16.81	8.46
10/10/03 16:20	3.03	799.03	5.36	8.30	10.72	806.72	10.31	15.96	8.37
10/10/03 16:25	3.03	799.03	5.22	8.08	10.69	806.69	9.81	15.18	8.28
10/10/03 16:30	3.03	799.03	5.08	7.86	10.67	806.67	9.35	14.46	8.19
10/10/03 16:35	3.03	799.03	4.93	7.63	10.65	806.65	8.92	13.81	8.11
10/10/03 16:40	3.03	799.03	4.78	7.40	10.63	806.63	8.53	13.20	8.03
10/10/03 16:45	3.03	799.03	4.62	7.15	10.61	806.61	8.17	12.64	7.95
10/10/03 16:50	3.03	799.03	4.45	6.89	10.60	806.60	7.83	12.11	7.87
10/10/03 16:55	3.03	799.03	4.27	6.61	10.58	806.58	7.51	11.62	7.80
10/10/03 17:00	3.02	799.02	4.11	6.35	10.56	806.56	7.21	11.15	7.73
10/10/03 17:05	3.02	799.02	3.95	6.12	10.55	806.55	6.92	10.71	7.66
10/10/03 17:10	3.02	799.02	3.82	5.90	10.54	806.54	6.65	10.29	7.59
10/10/03 17:15	3.02	799.02	3.70	5.72	10.52	806.52	6.39	9.89	7.51
10/10/03 17:20	3.02	799.02	3.59	5.56	10.51	806.51	6.15	9.52	7.45
10/10/03 17:25	3.02	799.02	3.51	5.43	10.50	806.50	5.93	9.17	7.38
10/10/03 17:30	3.02	799.02	3.44	5.32	10.48	806.48	5.72	8.85	7.32
10/10/03 17:35	3.02	799.02	3.36	5.20	10.47	806.47	5.52	8.55	7.26
10/10/03 17:40	3.02	799.02	3.26	5.04	10.46	806.46	5.34	8.26	7.20
10/10/03 17:45	3.02	799.02	3.15	4.87	10.45	806.45	5.16	7.99	7.14
10/10/03 17:50	3.02	799.02	3.05	4.71	10.44	806.44	4.99	7.73	7.08
10/10/03 17:55	3.02	799.02	2.96	4.58	10.43	806.43	4.83	7.48	7.03
10/10/03 18:00	3.02	799.02	2.88	4.46	10.42	806.42	4.68	7.24	6.97
10/10/03 18:05	3.02	799.02	2.81	4.35	10.41	806.41	4.53	7.01	6.92
10/10/03 18:10	3.02	799.02	2.74	4.24	10.41	806.41	4.40	6.80	6.87
10/10/03 18:15	3.02	799.02	2.67	4.14	10.40	806.40	4.26	6.60	6.81

10/10/03 18:20	3.02	799.02	2.61	4.04	10.39	806.39	4.14	6.40	6.76
10/10/03 18:25	3.02	799.02	2.56	3.96	10.38	806.38	4.02	6.22	6.72
10/10/03 18:30	3.02	799.02	2.51	3.88	10.38	806.38	3.91	6.04	6.67
10/10/03 18:35	3.02	799.02	2.45	3.80	10.37	806.37	3.80	5.88	6.62
10/10/03 18:40	3.02	799.02	2.41	3.72	10.36	806.36	3.70	5.72	6.58
10/10/03 18:45	3.02	799.02	2.36	3.66	10.36	806.36	3.60	5.57	6.53
10/10/03 18:50	3.02	799.02	2.32	3.59	10.35	806.35	3.51	5.43	6.49
10/10/03 18:55	3.02	799.02	2.28	3.53	10.34	806.34	3.42	5.29	6.45
10/10/03 19:00	3.02	799.02	2.24	3.46	10.34	806.34	3.34	5.16	6.41
10/10/03 19:05	3.02	799.02	2.20	3.40	10.33	806.33	3.26	5.04	6.37
10/10/03 19:10	3.02	799.02	2.16	3.34	10.33	806.33	3.18	4.92	6.33
10/10/03 19:15	3.02	799.02	2.12	3.28	10.32	806.32	3.11	4.81	6.29
10/10/03 19:20	3.02	799.02	2.08	3.23	10.32	806.32	3.04	4.70	6.25
10/10/03 19:25	3.02	799.02	2.05	3.18	10.31	806.31	2.97	4.60	6.22
10/10/03 19:30	3.02	799.02	2.02	3.13	10.31	806.31	2.91	4.50	6.18
10/10/03 19:35	3.02	799.02	1.99	3.09	10.30	806.30	2.85	4.40	6.15
10/10/03 19:40	3.01	799.01	1.96	3.04	10.30	806.30	2.79	4.31	6.12
10/10/03 19:45	3.01	799.01	1.93	2.99	10.30	806.30	2.73	4.22	6.09
10/10/03 19:50	3.01	799.01	1.90	2.94	10.29	806.29	2.68	4.14	6.05
10/10/03 19:55	3.01	799.01	1.87	2.89	10.29	806.29	2.62	4.06	6.02
10/10/03 20:00	3.01	799.01	1.84	2.84	10.28	806.28	2.57	3.98	5.99
10/10/03 20:05	3.01	799.01	1.80	2.79	10.28	806.28	2.52	3.90	5.96
10/10/03 20:10	3.01	799.01	1.77	2.74	10.28	806.28	2.47	3.83	5.93
10/10/03 20:15	3.01	799.01	1.73	2.68	10.27	806.27	2.43	3.75	5.90
10/10/03 20:20	3.01	799.01	1.70	2.63	10.27	806.27	2.38	3.68	5.87
10/10/03 20:25	3.01	799.01	1.67	2.58	10.27	806.27	2.33	3.61	5.84
10/10/03 20:30	3.01	799.01	1.64	2.53	10.26	806.26	2.29	3.54	5.81
10/10/03 20:35	3.01	799.01	1.61	2.49	10.26	806.26	2.25	3.48	5.78
10/10/03 20:40	3.01	799.01	1.58	2.45	10.26	806.26	2.20	3.41	5.75
10/10/03 20:45	3.01	799.01	1.56	2.41	10.25	806.25	2.16	3.35	5.72
10/10/03 20:50	3.01	799.01	1.53	2.37	10.25	806.25	2.12	3.28	5.69
10/10/03 20:55	3.01	799.01	1.51	2.33	10.25	806.25	2.08	3.23	5.67
10/10/03 21:00	3.01	799.01	1.48	2.29	10.24	806.24	2.05	3.17	5.64
10/10/03 21:05	3.01	799.01	1.46	2.26	10.24	806.24	2.01	3.11	5.61
10/10/03 21:10	3.01	799.01	1.43	2.22	10.24	806.24	1.97	3.05	5.58
10/10/03 21:15	3.01	799.01	1.41	2.18	10.24	806.24	1.94	3.00	5.56
10/10/03 21:20	3.01	799.01	1.39	2.15	10.23	806.23	1.91	2.95	5.53
10/10/03 21:25	3.01	799.01	1.37	2.12	10.23	806.23	1.87	2.90	5.50
10/10/03 21:30	3.01	799.01	1.35	2.09	10.23	806.23	1.84	2.85	5.48
10/10/03 21:35	3.01	799.01	1.33	2.06	10.23	806.23	1.81	2.80	5.45
10/10/03 21:40	3.01	799.01	1.32	2.03	10.22	806.22	1.78	2.75	5.43
10/10/03 21:45	3.01	799.01	1.30	2.01	10.22	806.22	1.75	2.71	5.40
10/10/03 21:50	3.01	799.01	1.28	1.98	10.22	806.22	1.72	2.67	5.38
10/10/03 21:55	3.01	799.01	1.26	1.95	10.22	806.22	1.70	2.62	5.36
10/10/03 22:00	3.01	799.01	1.25	1.93	10.21	806.21	1.67	2.58	5.33
10/10/03 22:05	3.01	799.01	1.23	1.91	10.21	806.21	1.64	2.54	5.31
10/10/03 22:10	3.01	799.01	1.22	1.89	10.21	806.21	1.62	2.50	5.29
10/10/03 22:15	3.01	799.01	1.21	1.87	10.21	806.21	1.59	2.47	5.27
10/10/03 22:20	3.01	799.01	1.20	1.85	10.21	806.21	1.57	2.43	5.25
10/10/03 22:25	3.01	799.01	1.19	1.84	10.20	806.20	1.55	2.40	5.23
10/10/03 22:30	3.01	799.01	1.18	1.82	10.20	806.20	1.53	2.36	5.21
10/10/03 22:35	3.01	799.01	1.17	1.81	10.20	806.20	1.51	2.33	5.19
10/10/03 22:40	3.01	799.01	1.16	1.79	10.20	806.20	1.49	2.30	5.17
10/10/03 22:45	3.01	799.01	1.15	1.78	10.20	806.20	1.47	2.27	5.15
10/10/03 22:50	3.01	799.01	1.14	1.76	10.19	806.19	1.45	2.24	5.13
10/10/03 22:55	3.01	799.01	1.13	1.75	10.19	806.19	1.43	2.21	5.12
10/10/03 23:00	3.01	799.01	1.12	1.74	10.19	806.19	1.41	2.19	5.10
10/10/03 23:05	3.01	799.01	1.12	1.73	10.19	806.19	1.40	2.16	5.08
10/10/03 23:10	3.01	799.01	1.11	1.71	10.19	806.19	1.38	2.14	5.07
10/10/03 23:15	3.01	799.01	1.10	1.70	10.19	806.19	1.37	2.11	5.05
10/10/03 23:20	3.01	799.01	1.10	1.69	10.19	806.19	1.35	2.09	5.03
10/10/03 23:25	3.01	799.01	1.09	1.69	10.18	806.18	1.34	2.07	5.02
10/10/03 23:30	3.01	799.01	1.08	1.68	10.18	806.18	1.32	2.05	5.00
10/10/03 23:35	3.01	799.01	1.08	1.67	10.18	806.18	1.31	2.03	4.99
10/10/03 23:40	3.01	799.01	1.07	1.66	10.18	806.18	1.30	2.01	4.97
10/10/03 23:45	3.01	799.01	1.07	1.65	10.18	806.18	1.29	1.99	4.96
10/10/03 23:50	3.01	799.01	1.06	1.65	10.18	806.18	1.27	1.97	4.95
10/10/03 23:55	3.01	799.01	1.06	1.64	10.18	806.18	1.26	1.95	4.94

10/11/03 00:00	3.01	799.01	1.05	1.63	10.18	806.18	1.25	1.94	4.93
10/11/03 00:05	3.01	799.01	1.04	1.61	10.18	806.18	1.24	1.92	4.91
10/11/03 00:10	3.01	799.01	1.02	1.58	10.17	806.17	1.23	1.90	4.90
10/11/03 00:15	3.01	799.01	1.01	1.56	10.17	806.17	1.22	1.88	4.89
10/11/03 00:20	3.01	799.01	0.99	1.53	10.17	806.17	1.21	1.86	4.88
10/11/03 00:25	3.01	799.01	0.97	1.51	10.17	806.17	1.19	1.85	4.86
10/11/03 00:30	3.01	799.01	0.96	1.49	10.17	806.17	1.18	1.83	4.85
10/11/03 00:35	3.01	799.01	0.95	1.47	10.17	806.17	1.17	1.81	4.84
10/11/03 00:40	3.01	799.01	0.94	1.46	10.17	806.17	1.16	1.79	4.82
10/11/03 00:45	3.01	799.01	0.93	1.44	10.17	806.17	1.14	1.77	4.81
10/11/03 00:50	3.01	799.01	0.93	1.43	10.16	806.16	1.13	1.75	4.79
10/11/03 00:55	3.01	799.01	0.92	1.42	10.16	806.16	1.12	1.73	4.78
10/11/03 01:00	3.01	799.01	0.91	1.41	10.16	806.16	1.11	1.72	4.77
10/11/03 01:05	3.01	799.01	0.91	1.40	10.16	806.16	1.10	1.70	4.76
10/11/03 01:10	3.01	799.01	0.90	1.39	10.16	806.16	1.09	1.68	4.74
10/11/03 01:15	3.01	799.01	0.89	1.38	10.16	806.16	1.08	1.67	4.73
10/11/03 01:20	3.01	799.01	0.89	1.38	10.16	806.16	1.07	1.65	4.72
10/11/03 01:25	3.01	799.01	0.88	1.37	10.16	806.16	1.06	1.64	4.71
10/11/03 01:30	3.01	799.01	0.88	1.36	10.16	806.16	1.05	1.62	4.69
10/11/03 01:35	3.01	799.01	0.87	1.35	10.16	806.16	1.04	1.61	4.68
10/11/03 01:40	3.01	799.01	0.87	1.35	10.15	806.15	1.03	1.59	4.67
10/11/03 01:45	3.01	799.01	0.87	1.34	10.15	806.15	1.02	1.58	4.66
10/11/03 01:50	3.01	799.01	0.86	1.33	10.15	806.15	1.01	1.57	4.65
10/11/03 01:55	3.01	799.01	0.86	1.33	10.15	806.15	1.00	1.55	4.64
10/11/03 02:00	3.01	799.01	0.85	1.32	10.15	806.15	1.00	1.54	4.63
10/11/03 02:05	3.01	799.01	0.85	1.31	10.15	806.15	0.99	1.53	4.62
10/11/03 02:10	3.01	799.01	0.84	1.31	10.15	806.15	0.98	1.52	4.61
10/11/03 02:15	3.01	799.01	0.84	1.30	10.15	806.15	0.97	1.51	4.60
10/11/03 02:20	3.01	799.01	0.84	1.29	10.15	806.15	0.97	1.50	4.59
10/11/03 02:25	3.01	799.01	0.83	1.29	10.15	806.15	0.96	1.48	4.57
10/11/03 02:30	3.01	799.01	0.83	1.28	10.15	806.15	0.95	1.47	4.56
10/11/03 02:35	3.01	799.01	0.82	1.27	10.15	806.15	0.95	1.46	4.55
10/11/03 02:40	3.01	799.01	0.82	1.27	10.15	806.15	0.94	1.45	4.54
10/11/03 02:45	3.01	799.01	0.82	1.26	10.15	806.15	0.93	1.44	4.54
10/11/03 02:50	3.01	799.01	0.81	1.26	10.14	806.14	0.93	1.43	4.53
10/11/03 02:55	3.01	799.01	0.81	1.25	10.14	806.14	0.92	1.42	4.52
10/11/03 03:00	3.01	799.01	0.80	1.24	10.14	806.14	0.91	1.42	4.51
10/11/03 03:05	3.01	799.01	0.80	1.24	10.14	806.14	0.91	1.41	4.50
10/11/03 03:10	3.01	799.01	0.80	1.23	10.14	806.14	0.90	1.40	4.49
10/11/03 03:15	3.01	799.01	0.80	1.23	10.14	806.14	0.90	1.39	4.48
10/11/03 03:20	3.01	799.01	0.79	1.23	10.14	806.14	0.89	1.38	4.47
10/11/03 03:25	3.01	799.01	0.79	1.22	10.14	806.14	0.89	1.37	4.46
10/11/03 03:30	3.01	799.01	0.79	1.22	10.14	806.14	0.88	1.36	4.46
10/11/03 03:35	3.01	799.01	0.78	1.21	10.14	806.14	0.88	1.36	4.45
10/11/03 03:40	3.01	799.01	0.78	1.21	10.14	806.14	0.87	1.35	4.44
10/11/03 03:45	3.01	799.01	0.78	1.21	10.14	806.14	0.87	1.34	4.44
10/11/03 03:50	3.01	799.01	0.78	1.20	10.14	806.14	0.86	1.34	4.43
10/11/03 03:55	3.01	799.01	0.78	1.20	10.14	806.14	0.86	1.33	4.42
10/11/03 04:00	3.01	799.01	0.77	1.20	10.14	806.14	0.85	1.32	4.42
10/11/03 04:05	3.01	799.01	0.77	1.20	10.14	806.14	0.85	1.32	4.41
10/11/03 04:10	3.01	799.01	0.77	1.19	10.14	806.14	0.85	1.31	4.41
10/11/03 04:15	3.01	799.01	0.77	1.19	10.14	806.14	0.84	1.30	4.40
10/11/03 04:20	3.01	799.01	0.77	1.19	10.14	806.14	0.84	1.30	4.40
10/11/03 04:25	3.01	799.01	0.77	1.19	10.13	806.13	0.84	1.29	4.39
10/11/03 04:30	3.01	799.01	0.77	1.19	10.13	806.13	0.83	1.29	4.39
10/11/03 04:35	3.01	799.01	0.77	1.18	10.13	806.13	0.83	1.28	4.38
10/11/03 04:40	3.01	799.01	0.76	1.18	10.13	806.13	0.83	1.28	4.38
10/11/03 04:45	3.01	799.01	0.76	1.18	10.13	806.13	0.82	1.27	4.38
10/11/03 04:50	3.01	799.01	0.76	1.18	10.13	806.13	0.82	1.27	4.37
10/11/03 04:55	3.01	799.01	0.76	1.18	10.13	806.13	0.82	1.26	4.37
10/11/03 05:00	3.01	799.01	0.76	1.18	10.13	806.13	0.81	1.26	4.36
10/11/03 05:05	3.01	799.01	0.76	1.18	10.13	806.13	0.81	1.26	4.36
10/11/03 05:10	3.01	799.01	0.76	1.18	10.13	806.13	0.81	1.25	4.36
10/11/03 05:15	3.01	799.01	0.76	1.18	10.13	806.13	0.81	1.25	4.35
10/11/03 05:20	3.01	799.01	0.76	1.18	10.13	806.13	0.80	1.24	4.35
10/11/03 05:25	3.01	799.01	0.76	1.18	10.13	806.13	0.80	1.24	4.35
10/11/03 05:30	3.01	799.01	0.76	1.18	10.13	806.13	0.80	1.24	4.35
10/11/03 05:35	3.01	799.01	0.76	1.17	10.13	806.13	0.80	1.23	4.34

10/11/03 05:40	3.01	799.01	0.76	1.17	10.13	806.13	0.80	1.23	4.34
10/11/03 05:45	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.23	4.34
10/11/03 05:50	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.23	4.33
10/11/03 05:55	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.22	4.33
10/11/03 06:00	3.01	799.01	0.75	1.17	10.13	806.13	0.79	1.22	4.33
10/11/03 06:05	3.01	799.01	0.75	1.17	10.13	806.13	0.79	1.22	4.33
10/11/03 06:10	3.01	799.01	0.75	1.17	10.13	806.13	0.79	1.21	4.33
10/11/03 06:15	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.21	4.32
10/11/03 06:20	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.21	4.32
10/11/03 06:25	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.21	4.32
10/11/03 06:30	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.21	4.32
10/11/03 06:35	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.20	4.31
10/11/03 06:40	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.20	4.31
10/11/03 06:45	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.20	4.31
10/11/03 06:50	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.20	4.31
10/11/03 06:55	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.20	4.31
10/11/03 07:00	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.19	4.31
10/11/03 07:05	3.01	799.01	0.75	1.15	10.13	806.13	0.77	1.19	4.30
10/11/03 07:10	3.01	799.01	0.75	1.15	10.13	806.13	0.77	1.19	4.30
10/11/03 07:15	3.01	799.01	0.74	1.15	10.13	806.13	0.77	1.19	4.30
10/11/03 07:20	3.01	799.01	0.74	1.15	10.13	806.13	0.77	1.19	4.30
10/11/03 07:25	3.01	799.01	0.74	1.15	10.13	806.13	0.77	1.18	4.30
10/11/03 07:30	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.18	4.30
10/11/03 07:35	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.18	4.29
10/11/03 07:40	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.18	4.29
10/11/03 07:45	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.18	4.29
10/11/03 07:50	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.18	4.29
10/11/03 07:55	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.29
10/11/03 08:00	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.29
10/11/03 08:05	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.28
10/11/03 08:10	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.28
10/11/03 08:15	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.28
10/11/03 08:20	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.17	4.28
10/11/03 08:25	3.01	799.01	0.73	1.14	10.13	806.13	0.75	1.17	4.28
10/11/03 08:30	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.28
10/11/03 08:35	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.28
10/11/03 08:40	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.28
10/11/03 08:45	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/11/03 08:50	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/11/03 08:55	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/11/03 09:00	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/11/03 09:05	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.15	4.27
10/11/03 09:10	3.01	799.01	0.73	1.12	10.12	806.12	0.75	1.15	4.27
10/11/03 09:15	3.01	799.01	0.73	1.12	10.12	806.12	0.74	1.15	4.27
10/11/03 09:20	3.01	799.01	0.73	1.12	10.12	806.12	0.74	1.15	4.26
10/11/03 09:25	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.26
10/11/03 09:30	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.26
10/11/03 09:35	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.26
10/11/03 09:40	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.26
10/11/03 09:45	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.26
10/11/03 09:50	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.26
10/11/03 09:55	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.26
10/11/03 10:00	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.25
10/11/03 10:05	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.25
10/11/03 10:10	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.14	4.25
10/11/03 10:15	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.14	4.25
10/11/03 10:20	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/11/03 10:25	3.01	799.01	0.71	1.11	10.12	806.12	0.73	1.13	4.25
10/11/03 10:30	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.25
10/11/03 10:35	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.25
10/11/03 10:40	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/11/03 10:45	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/11/03 10:50	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/11/03 10:55	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/11/03 11:00	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/11/03 11:05	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.24
10/11/03 11:10	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.24
10/11/03 11:15	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.24

10/11/03 11:20	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.12	4.23
10/11/03 11:25	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.12	4.23
10/11/03 11:30	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/11/03 11:35	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/11/03 11:40	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.23
10/11/03 11:45	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.23
10/11/03 11:50	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.23
10/11/03 11:55	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.22
10/11/03 12:00	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.22
10/11/03 12:05	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.11	4.22
10/11/03 12:10	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/11/03 12:15	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.22
10/11/03 12:20	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.22
10/11/03 12:25	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.22
10/11/03 12:30	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.22
10/11/03 12:35	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.21
10/11/03 12:40	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.21
10/11/03 12:45	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/11/03 12:50	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/11/03 12:55	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/11/03 13:00	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/11/03 13:05	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.21
10/11/03 13:10	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.09	4.21
10/11/03 13:15	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.09	4.20
10/11/03 13:20	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.09	4.20
10/11/03 13:25	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.20
10/11/03 13:30	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.20
10/11/03 13:35	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.20
10/11/03 13:40	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.20
10/11/03 13:45	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.20
10/11/03 13:50	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.19
10/11/03 13:55	3.01	799.01	0.67	1.04	10.12	806.12	0.70	1.08	4.19
10/11/03 14:00	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.07	4.19
10/11/03 14:05	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.07	4.19
10/11/03 14:10	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.07	4.19
10/11/03 14:15	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.07	4.19
10/11/03 14:20	3.01	799.01	0.67	1.03	10.12	806.12	0.69	1.07	4.18
10/11/03 14:25	3.01	799.01	0.67	1.03	10.12	806.12	0.69	1.07	4.18
10/11/03 14:30	3.01	799.01	0.67	1.03	10.12	806.12	0.69	1.06	4.18
10/11/03 14:35	3.01	799.01	0.66	1.03	10.12	806.12	0.69	1.06	4.18
10/11/03 14:40	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.06	4.18
10/11/03 14:45	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.06	4.17
10/11/03 14:50	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.06	4.17
10/11/03 14:55	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.06	4.17
10/11/03 15:00	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.05	4.17
10/11/03 15:05	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/11/03 15:10	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/11/03 15:15	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/11/03 15:20	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/11/03 15:25	3.01	799.01	0.65	1.00	10.12	806.12	0.68	1.04	4.16
10/11/03 15:30	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 15:35	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 15:40	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.04	4.15
10/11/03 15:45	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.04	4.15
10/11/03 15:50	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/11/03 15:55	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/11/03 16:00	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/11/03 16:05	3.01	799.01	0.64	0.98	10.12	806.12	0.66	1.03	4.14
10/11/03 16:10	3.01	799.01	0.63	0.98	10.12	806.12	0.66	1.03	4.13
10/11/03 16:15	3.01	799.01	0.63	0.98	10.12	806.12	0.66	1.02	4.13
10/11/03 16:20	3.01	799.01	0.63	0.98	10.12	806.12	0.66	1.02	4.13
10/11/03 16:25	3.01	799.01	0.63	0.97	10.12	806.12	0.66	1.02	4.12
10/11/03 16:30	3.01	799.01	0.63	0.97	10.11	806.11	0.66	1.02	4.12
10/11/03 16:35	3.01	799.01	0.63	0.97	10.11	806.11	0.66	1.01	4.12
10/11/03 16:40	3.01	799.01	0.62	0.96	10.11	806.11	0.65	1.01	4.12
10/11/03 16:45	3.01	799.01	0.62	0.96	10.11	806.11	0.65	1.01	4.11
10/11/03 16:50	3.01	799.01	0.62	0.96	10.11	806.11	0.65	1.01	4.11
10/11/03 16:55	3.01	799.01	0.62	0.96	10.11	806.11	0.65	1.01	4.11

10/11/03 17:00	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.00	4.11
10/11/03 17:05	3.01	799.01	0.61	0.95	10.11	806.11	0.65	1.00	4.10
10/11/03 17:10	3.01	799.01	0.61	0.95	10.11	806.11	0.65	1.00	4.10
10/11/03 17:15	3.01	799.01	0.61	0.95	10.11	806.11	0.64	1.00	4.10
10/11/03 17:20	3.01	799.01	0.61	0.95	10.11	806.11	0.64	0.99	4.09
10/11/03 17:25	3.01	799.01	0.61	0.95	10.11	806.11	0.64	0.99	4.09
10/11/03 17:30	3.01	799.01	0.61	0.95	10.11	806.11	0.64	0.99	4.09
10/11/03 17:35	3.01	799.01	0.61	0.94	10.11	806.11	0.64	0.99	4.09
10/11/03 17:40	3.01	799.01	0.61	0.94	10.11	806.11	0.64	0.99	4.08
10/11/03 17:45	3.01	799.01	0.61	0.94	10.11	806.11	0.64	0.98	4.08
10/11/03 17:50	3.01	799.01	0.60	0.93	10.11	806.11	0.63	0.98	4.08
10/11/03 17:55	3.01	799.01	0.60	0.93	10.11	806.11	0.63	0.98	4.08
10/11/03 18:00	3.01	799.01	0.60	0.93	10.11	806.11	0.63	0.98	4.07
10/11/03 18:05	3.01	799.01	0.60	0.92	10.11	806.11	0.63	0.97	4.07
10/11/03 18:10	3.01	799.01	0.59	0.92	10.11	806.11	0.63	0.97	4.07
10/11/03 18:15	3.01	799.01	0.59	0.91	10.11	806.11	0.63	0.97	4.06
10/11/03 18:20	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.97	4.06
10/11/03 18:25	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.96	4.06
10/11/03 18:30	3.01	799.01	0.58	0.90	10.11	806.11	0.62	0.96	4.05
10/11/03 18:35	3.01	799.01	0.58	0.90	10.11	806.11	0.62	0.96	4.05
10/11/03 18:40	3.01	799.01	0.58	0.90	10.11	806.11	0.62	0.96	4.05
10/11/03 18:45	3.01	799.01	0.58	0.89	10.11	806.11	0.62	0.95	4.04
10/11/03 18:50	3.01	799.01	0.58	0.89	10.11	806.11	0.61	0.95	4.04
10/11/03 18:55	3.01	799.01	0.57	0.89	10.11	806.11	0.61	0.95	4.04
10/11/03 19:00	3.01	799.01	0.57	0.88	10.11	806.11	0.61	0.94	4.03
10/11/03 19:05	3.01	799.01	0.57	0.88	10.11	806.11	0.61	0.94	4.03
10/11/03 19:10	3.01	799.01	0.57	0.88	10.11	806.11	0.61	0.94	4.02
10/11/03 19:15	3.01	799.01	0.57	0.88	10.11	806.11	0.61	0.94	4.02
10/11/03 19:20	3.01	799.01	0.56	0.87	10.11	806.11	0.60	0.93	4.02
10/11/03 19:25	3.01	799.01	0.56	0.87	10.11	806.11	0.60	0.93	4.01
10/11/03 19:30	3.01	799.01	0.56	0.87	10.11	806.11	0.60	0.93	4.01
10/11/03 19:35	3.01	799.01	0.56	0.86	10.11	806.11	0.60	0.92	4.01
10/11/03 19:40	3.01	799.01	0.56	0.86	10.11	806.11	0.60	0.92	4.00
10/11/03 19:45	3.01	799.01	0.55	0.86	10.11	806.11	0.59	0.92	4.00
10/11/03 19:50	3.01	799.01	0.55	0.86	10.11	806.11	0.59	0.92	3.99
10/11/03 19:55	3.01	799.01	0.55	0.85	10.11	806.11	0.59	0.91	3.99
10/11/03 20:00	3.01	799.01	0.55	0.85	10.11	806.11	0.59	0.91	3.99
10/11/03 20:05	3.01	799.01	0.55	0.85	10.11	806.11	0.59	0.91	3.98
10/11/03 20:10	3.01	799.01	0.55	0.84	10.11	806.11	0.59	0.91	3.98
10/11/03 20:15	3.01	799.01	0.54	0.84	10.11	806.11	0.58	0.90	3.98
10/11/03 20:20	3.01	799.01	0.54	0.84	10.11	806.11	0.58	0.90	3.97
10/11/03 20:25	3.01	799.01	0.54	0.84	10.11	806.11	0.58	0.90	3.97
10/11/03 20:30	3.01	799.01	0.54	0.83	10.11	806.11	0.58	0.89	3.96
10/11/03 20:35	3.01	799.01	0.54	0.83	10.11	806.11	0.58	0.89	3.96
10/11/03 20:40	3.01	799.01	0.54	0.83	10.11	806.11	0.57	0.89	3.96
10/11/03 20:45	3.01	799.01	0.53	0.83	10.10	806.10	0.57	0.89	3.95
10/11/03 20:50	3.01	799.01	0.53	0.83	10.10	806.10	0.57	0.88	3.95
10/11/03 20:55	3.01	799.01	0.53	0.82	10.10	806.10	0.57	0.88	3.95
10/11/03 21:00	3.01	799.01	0.53	0.82	10.10	806.10	0.57	0.88	3.94
10/11/03 21:05	3.01	799.01	0.53	0.82	10.10	806.10	0.57	0.88	3.94
10/11/03 21:10	3.01	799.01	0.53	0.82	10.10	806.10	0.56	0.87	3.94
10/11/03 21:15	3.01	799.01	0.53	0.81	10.10	806.10	0.56	0.87	3.93
10/11/03 21:20	3.01	799.01	0.53	0.81	10.10	806.10	0.56	0.87	3.93
10/11/03 21:25	3.01	799.01	0.52	0.81	10.10	806.10	0.56	0.87	3.93
10/11/03 21:30	3.01	799.01	0.52	0.81	10.10	806.10	0.56	0.86	3.92
10/11/03 21:35	3.01	799.01	0.52	0.81	10.10	806.10	0.56	0.86	3.92
10/11/03 21:40	3.01	799.01	0.52	0.81	10.10	806.10	0.55	0.86	3.91
10/11/03 21:45	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.86	3.91
10/11/03 21:50	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.85	3.91
10/11/03 21:55	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.85	3.90
10/11/03 22:00	3.01	799.01	0.52	0.80	10.10	806.10	0.55	0.85	3.90
10/11/03 22:05	3.01	799.01	0.51	0.80	10.10	806.10	0.55	0.85	3.90
10/11/03 22:10	3.01	799.01	0.51	0.79	10.10	806.10	0.55	0.84	3.90
10/11/03 22:15	3.01	799.01	0.51	0.79	10.10	806.10	0.54	0.84	3.89
10/11/03 22:20	3.02	799.02	2.22	3.43	10.11	806.11	0.55	0.86	3.91
10/11/03 22:25	3.01	799.01	0.87	1.34	10.11	806.11	0.61	0.94	4.02
10/11/03 22:30	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.95	4.04
10/11/03 22:35	3.01	799.01	0.54	0.83	10.11	806.11	0.61	0.95	4.04

10/11/03 22:40	3.01	799.01	0.52	0.80	10.11	806.11	0.61	0.94	4.03
10/11/03 22:45	3.01	799.01	0.51	0.79	10.11	806.11	0.61	0.94	4.02
10/11/03 22:50	3.01	799.01	0.51	0.78	10.11	806.11	0.60	0.93	4.01
10/11/03 22:55	3.01	799.01	0.50	0.78	10.11	806.11	0.60	0.92	4.00
10/11/03 23:00	3.01	799.01	0.50	0.78	10.11	806.11	0.59	0.92	4.00
10/11/03 23:05	3.01	799.01	0.50	0.78	10.11	806.11	0.59	0.91	3.99
10/11/03 23:10	3.01	799.01	0.50	0.78	10.11	806.11	0.58	0.91	3.98
10/11/03 23:15	3.01	799.01	0.50	0.78	10.11	806.11	0.58	0.90	3.97
10/11/03 23:20	3.01	799.01	0.50	0.77	10.11	806.11	0.58	0.89	3.96
10/11/03 23:25	3.01	799.01	0.50	0.77	10.10	806.10	0.57	0.89	3.96
10/11/03 23:30	3.01	799.01	0.50	0.77	10.10	806.10	0.57	0.88	3.95
10/11/03 23:35	3.01	799.01	0.50	0.77	10.10	806.10	0.57	0.88	3.94
10/11/03 23:40	3.01	799.01	0.50	0.77	10.10	806.10	0.56	0.87	3.94
10/11/03 23:45	3.01	799.01	0.50	0.77	10.10	806.10	0.56	0.87	3.93
10/11/03 23:50	3.01	799.01	0.50	0.77	10.10	806.10	0.56	0.86	3.92
10/11/03 23:55	3.01	799.01	0.49	0.77	10.10	806.10	0.56	0.86	3.92
10/12/03 00:00	3.01	799.01	0.49	0.76	10.10	806.10	0.55	0.86	3.91
10/12/03 00:05	3.01	799.01	0.49	0.76	10.10	806.10	0.55	0.85	3.91
10/12/03 00:10	3.01	799.01	0.49	0.76	10.10	806.10	0.55	0.85	3.90
10/12/03 00:15	3.01	799.01	0.49	0.76	10.10	806.10	0.55	0.84	3.89
10/12/03 00:20	3.01	799.01	0.49	0.76	10.10	806.10	0.54	0.84	3.89
10/12/03 00:25	3.01	799.01	0.49	0.76	10.10	806.10	0.54	0.84	3.88
10/12/03 00:30	3.01	799.01	0.49	0.76	10.10	806.10	0.54	0.83	3.88
10/12/03 00:35	3.01	799.01	0.49	0.76	10.10	806.10	0.54	0.83	3.87
10/12/03 00:40	3.01	799.01	0.49	0.76	10.10	806.10	0.53	0.83	3.87
10/12/03 00:45	3.01	799.01	0.49	0.75	10.10	806.10	0.53	0.82	3.86
10/12/03 00:50	3.01	799.01	0.49	0.75	10.10	806.10	0.53	0.82	3.86
10/12/03 00:55	3.01	799.01	0.49	0.75	10.10	806.10	0.53	0.82	3.86
10/12/03 01:00	3.01	799.01	0.49	0.75	10.10	806.10	0.53	0.81	3.85
10/12/03 01:05	3.01	799.01	0.48	0.75	10.10	806.10	0.52	0.81	3.85
10/12/03 01:10	3.01	799.01	0.48	0.75	10.10	806.10	0.52	0.81	3.84
10/12/03 01:15	3.01	799.01	0.48	0.75	10.10	806.10	0.52	0.81	3.84
10/12/03 01:20	3.01	799.01	0.48	0.75	10.10	806.10	0.52	0.80	3.84
10/12/03 01:25	3.01	799.01	0.48	0.75	10.10	806.10	0.52	0.80	3.83
10/12/03 01:30	3.01	799.01	0.48	0.75	10.10	806.10	0.52	0.80	3.83
10/12/03 01:35	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.80	3.83
10/12/03 01:40	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.79	3.82
10/12/03 01:45	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.79	3.82
10/12/03 01:50	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.79	3.81
10/12/03 01:55	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.79	3.81
10/12/03 02:00	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.79	3.81
10/12/03 02:05	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.78	3.80
10/12/03 02:10	3.01	799.01	0.48	0.74	10.10	806.10	0.51	0.78	3.80
10/12/03 02:15	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.78	3.80
10/12/03 02:20	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.78	3.79
10/12/03 02:25	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.78	3.79
10/12/03 02:30	3.01	799.01	0.47	0.73	10.10	806.10	0.50	0.77	3.79
10/12/03 02:35	3.01	799.01	0.47	0.73	10.10	806.10	0.50	0.77	3.79
10/12/03 02:40	3.01	799.01	0.47	0.73	10.10	806.10	0.50	0.77	3.78
10/12/03 02:45	3.01	799.01	0.47	0.73	10.10	806.10	0.50	0.77	3.78
10/12/03 02:50	3.01	799.01	0.47	0.73	10.10	806.10	0.50	0.77	3.78
10/12/03 02:55	3.01	799.01	0.47	0.73	10.10	806.10	0.50	0.77	3.78
10/12/03 03:00	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.77
10/12/03 03:05	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.77
10/12/03 03:10	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.77
10/12/03 03:15	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.77
10/12/03 03:20	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.77
10/12/03 03:25	3.01	799.01	0.47	0.72	10.09	806.09	0.49	0.76	3.76
10/12/03 03:30	3.01	799.01	0.47	0.72	10.09	806.09	0.49	0.76	3.76
10/12/03 03:35	3.01	799.01	0.47	0.72	10.09	806.09	0.49	0.75	3.76
10/12/03 03:40	3.01	799.01	0.47	0.72	10.09	806.09	0.49	0.75	3.76
10/12/03 03:45	3.01	799.01	0.47	0.72	10.09	806.09	0.49	0.75	3.76
10/12/03 03:50	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.75	3.76
10/12/03 03:55	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.75	3.75
10/12/03 04:00	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.75	3.75
10/12/03 04:05	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.75	3.75
10/12/03 04:10	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.75	3.75
10/12/03 04:15	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.75

10/12/03 04:20	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.75
10/12/03 04:25	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 04:30	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 04:35	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 04:40	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 04:45	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 04:50	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 04:55	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/12/03 05:00	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 05:05	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 05:10	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 05:15	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 05:20	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 05:25	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 05:30	3.01	799.01	0.46	0.70	10.09	806.09	0.47	0.73	3.73
10/12/03 05:35	3.01	799.01	0.46	0.70	10.09	806.09	0.47	0.73	3.72
10/12/03 05:40	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.73	3.72
10/12/03 05:45	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.73	3.72
10/12/03 05:50	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 05:55	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 06:00	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 06:05	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 06:10	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 06:15	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 06:20	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 06:25	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 06:30	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 06:35	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 06:40	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.71
10/12/03 06:45	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.71
10/12/03 06:50	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.71
10/12/03 06:55	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:00	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:05	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:10	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:15	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:20	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:25	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:30	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 07:35	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.69
10/12/03 07:40	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.69
10/12/03 07:45	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.70	3.69
10/12/03 07:50	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 07:55	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 08:00	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 08:05	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 08:10	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 08:15	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 08:20	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 08:25	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 08:30	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 08:35	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 08:40	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 08:45	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 08:50	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 08:55	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/12/03 09:00	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/12/03 09:05	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/12/03 09:10	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/12/03 09:15	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/12/03 09:20	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/12/03 09:25	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.67
10/12/03 09:30	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.67
10/12/03 09:35	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.67
10/12/03 09:40	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/12/03 09:45	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/12/03 09:50	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/12/03 09:55	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67

10/12/03 10:00	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/12/03 10:05	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/12/03 10:10	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/12/03 10:15	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:20	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:25	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:30	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:35	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:40	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:45	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/12/03 10:50	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/12/03 10:55	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/12/03 11:00	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/12/03 11:05	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/12/03 11:10	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/12/03 11:15	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/12/03 11:20	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/12/03 11:25	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/12/03 11:30	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.67	3.65
10/12/03 11:35	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.67	3.65
10/12/03 11:40	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.67	3.65
10/12/03 11:45	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.67	3.65
10/12/03 11:50	3.01	799.01	0.43	0.66	10.09	806.09	0.43	0.67	3.65
10/12/03 11:55	3.01	799.01	0.43	0.66	10.09	806.09	0.43	0.67	3.65
10/12/03 12:00	3.01	799.01	0.42	0.66	10.09	806.09	0.43	0.67	3.65
10/12/03 12:05	3.01	799.01	0.42	0.66	10.09	806.09	0.43	0.67	3.64
10/12/03 12:10	3.01	799.01	0.42	0.66	10.09	806.09	0.43	0.67	3.64
10/12/03 12:15	3.01	799.01	0.42	0.66	10.09	806.09	0.43	0.67	3.64
10/12/03 12:20	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:25	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:30	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:35	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:40	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:45	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:50	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/12/03 12:55	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.64
10/12/03 13:00	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:05	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:10	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:15	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:20	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:25	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:30	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:35	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:40	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/12/03 13:45	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.62
10/12/03 13:50	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.62
10/12/03 13:55	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.62
10/12/03 14:00	3.01	799.01	0.42	0.64	10.09	806.09	0.42	0.66	3.62
10/12/03 14:05	3.01	799.01	0.42	0.64	10.09	806.09	0.42	0.66	3.62
10/12/03 14:10	3.01	799.01	0.42	0.64	10.09	806.09	0.42	0.66	3.62
10/12/03 14:15	3.01	799.01	0.42	0.64	10.09	806.09	0.42	0.66	3.62
10/12/03 14:20	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/12/03 14:25	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.62
10/12/03 14:30	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.62
10/12/03 14:35	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 14:40	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 14:45	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 14:50	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 14:55	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 15:00	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 15:05	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 15:10	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 15:15	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 15:20	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/12/03 15:25	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60
10/12/03 15:30	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60
10/12/03 15:35	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60

10/12/03 15:40	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/12/03 15:45	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/12/03 15:50	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/12/03 15:55	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/12/03 16:00	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/12/03 16:05	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/12/03 16:10	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/12/03 16:15	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.59
10/12/03 16:20	3.01	799.01	0.41	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:25	3.01	799.01	0.41	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:30	3.01	799.01	0.41	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:35	3.01	799.01	0.41	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:40	3.01	799.01	0.40	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:45	3.01	799.01	0.40	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:50	3.01	799.01	0.40	0.63	10.08	806.08	0.41	0.64	3.59
10/12/03 16:55	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 17:00	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 17:05	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/12/03 17:10	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/12/03 17:15	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/12/03 17:20	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/12/03 17:25	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 17:30	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 17:35	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 17:40	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 17:45	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 17:50	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 17:55	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/12/03 18:00	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.57
10/12/03 18:05	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.57
10/12/03 18:10	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.57
10/12/03 18:15	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.57
10/12/03 18:20	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.57
10/12/03 18:25	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 18:30	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 18:35	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 18:40	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/12/03 18:45	3.01	799.01	0.40	0.61	10.08	806.08	0.40	0.63	3.57
10/12/03 18:50	3.01	799.01	0.40	0.61	10.08	806.08	0.40	0.63	3.56
10/12/03 18:55	3.01	799.01	0.40	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:00	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:05	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:10	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:15	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:20	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:25	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:30	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:35	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:40	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/12/03 19:45	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.55
10/12/03 19:50	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.55
10/12/03 19:55	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:00	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:05	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:10	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:15	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:20	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:25	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/12/03 20:30	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.55
10/12/03 20:35	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 20:40	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 20:45	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 20:50	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 20:55	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 21:00	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/12/03 21:05	3.01	799.01	0.39	0.60	10.08	806.08	0.39	0.61	3.54
10/12/03 21:10	3.01	799.01	0.39	0.60	10.08	806.08	0.39	0.61	3.54
10/12/03 21:15	3.01	799.01	0.39	0.60	10.08	806.08	0.39	0.61	3.54

10/12/03 21:20	3.01	799.01	0.38	0.60	10.08	806.08	0.39	0.61	3.54
10/12/03 21:25	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 21:30	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 21:35	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 21:40	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 21:45	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 21:50	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 21:55	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/12/03 22:00	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/12/03 22:05	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/12/03 22:10	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/12/03 22:15	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:20	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:25	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:30	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:35	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:40	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:45	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:50	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/12/03 22:55	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/12/03 23:00	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/12/03 23:05	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/12/03 23:10	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/12/03 23:15	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/12/03 23:20	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/12/03 23:25	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.60	3.51
10/12/03 23:30	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 23:35	3.00	799.00	0.38	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 23:40	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 23:45	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 23:50	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/12/03 23:55	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/13/03 00:00	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/13/03 00:05	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/13/03 00:10	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/13/03 00:15	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/13/03 00:20	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.50
10/13/03 00:25	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 00:30	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 00:35	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 00:40	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 00:45	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 00:50	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 00:55	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 01:00	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:05	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:10	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:15	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:20	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:25	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:30	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 01:35	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.48
10/13/03 01:40	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.48
10/13/03 01:45	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/13/03 01:50	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/13/03 01:55	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/13/03 02:00	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 02:05	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 02:10	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 02:15	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 02:20	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 02:25	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.47
10/13/03 02:30	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.47
10/13/03 02:35	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 02:40	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 02:45	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 02:50	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 02:55	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47

10/13/03 03:00	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 03:05	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 03:10	3.00	799.00	0.38	0.59	10.08	806.08	0.37	0.57	3.47
10/13/03 03:15	3.01	799.01	0.39	0.60	10.08	806.08	0.37	0.57	3.47
10/13/03 03:20	3.00	799.00	0.38	0.58	10.08	806.08	0.37	0.57	3.47
10/13/03 03:25	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.57	3.47
10/13/03 03:30	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 03:35	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 03:40	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 03:45	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 03:50	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 03:55	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:00	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:05	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:10	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:15	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:20	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:25	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 04:30	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 04:35	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 04:40	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 04:45	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 04:50	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 04:55	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 05:00	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 05:05	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 05:10	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 05:15	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:20	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:25	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:30	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:35	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:40	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:45	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 05:50	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.44
10/13/03 05:55	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:00	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:05	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:10	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:15	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:20	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:25	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:30	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 06:35	3.00	799.00	0.35	0.53	10.08	806.08	0.36	0.55	3.43
10/13/03 06:40	3.00	799.00	0.35	0.53	10.08	806.08	0.35	0.55	3.43
10/13/03 06:45	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 06:50	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 06:55	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 07:00	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 07:05	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 07:10	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 07:15	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 07:20	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/13/03 07:25	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/13/03 07:30	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 07:35	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 07:40	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 07:45	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 07:50	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 07:55	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 08:00	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 08:05	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 08:10	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 08:15	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/13/03 08:20	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/13/03 08:25	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/13/03 08:30	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/13/03 08:35	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.54	3.40

10/13/03 08:40	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.54	3.40
10/13/03 08:45	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.53	3.40
10/13/03 08:50	3.00	799.00	0.34	0.52	10.07	806.07	0.35	0.53	3.40
10/13/03 08:55	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.40
10/13/03 09:00	3.00	799.00	0.34	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:05	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:10	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:15	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:20	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:25	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:30	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 09:35	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 09:40	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 09:45	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 09:50	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 09:55	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 10:00	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 10:05	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 10:10	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 10:15	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 10:20	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 10:25	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 10:30	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 10:35	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/13/03 10:40	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/13/03 10:45	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/13/03 10:50	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/13/03 10:55	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/13/03 11:00	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.37
10/13/03 11:05	3.00	799.00	0.33	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 11:10	3.00	799.00	0.33	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 11:15	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.37
10/13/03 11:20	3.00	799.00	0.33	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 11:25	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 11:30	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 11:35	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 11:40	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 11:45	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 11:50	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 11:55	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 12:00	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 12:05	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 12:10	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 12:15	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 12:20	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 12:25	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 12:30	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.35
10/13/03 12:35	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 12:40	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 12:45	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 12:50	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 12:55	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 13:00	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 13:05	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 13:10	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 13:15	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 13:20	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 13:25	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 13:30	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.50	3.34
10/13/03 13:35	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.34
10/13/03 13:40	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.34
10/13/03 13:45	3.00	799.00	0.32	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 13:50	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 13:55	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 14:00	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 14:05	3.00	799.00	0.31	0.49	10.07	806.07	0.32	0.50	3.33
10/13/03 14:10	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.33
10/13/03 14:15	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.33

10/13/03 14:20	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.33
10/13/03 14:25	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.33
10/13/03 14:30	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 14:35	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 14:40	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 14:45	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.50	3.32
10/13/03 14:50	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 14:55	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 15:00	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 15:05	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 15:10	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 15:15	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.32
10/13/03 15:20	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 15:25	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 15:30	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 15:35	3.00	799.00	0.31	0.48	10.07	806.07	0.32	0.49	3.31
10/13/03 15:40	3.00	799.00	0.31	0.47	10.07	806.07	0.32	0.49	3.31
10/13/03 15:45	3.00	799.00	0.31	0.47	10.07	806.07	0.32	0.49	3.31
10/13/03 15:50	3.00	799.00	0.31	0.47	10.07	806.07	0.32	0.49	3.31
10/13/03 15:55	3.00	799.00	0.31	0.47	10.07	806.07	0.32	0.49	3.31
10/13/03 16:00	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.31
10/13/03 16:05	3.00	799.00	0.31	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 16:10	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 16:15	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.49	3.30
10/13/03 16:20	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 16:25	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 16:30	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 16:35	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 16:40	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 16:45	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.30
10/13/03 16:50	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 16:55	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 17:00	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 17:05	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 17:10	3.00	799.00	0.30	0.47	10.07	806.07	0.31	0.48	3.29
10/13/03 17:15	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.29
10/13/03 17:20	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.29
10/13/03 17:25	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.29
10/13/03 17:30	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.29
10/13/03 17:35	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 17:40	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 17:45	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 17:50	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.48	3.28
10/13/03 17:55	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 18:00	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 18:05	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 18:10	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 18:15	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 18:20	3.00	799.00	0.30	0.46	10.07	806.07	0.31	0.47	3.28
10/13/03 18:25	3.00	799.00	0.30	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 18:30	3.00	799.00	0.29	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 18:35	3.00	799.00	0.29	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 18:40	3.00	799.00	0.29	0.46	10.07	806.07	0.30	0.47	3.27
10/13/03 18:45	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.27
10/13/03 18:50	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.27
10/13/03 18:55	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.27
10/13/03 19:00	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.27
10/13/03 19:05	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.27
10/13/03 19:10	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 19:15	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 19:20	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 19:25	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.47	3.26
10/13/03 19:30	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 19:35	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 19:40	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 19:45	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 19:50	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.26
10/13/03 19:55	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25

10/13/03 20:00	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 20:05	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 20:10	3.00	799.00	0.29	0.45	10.07	806.07	0.30	0.46	3.25
10/13/03 20:15	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.25
10/13/03 20:20	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.25
10/13/03 20:25	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.25
10/13/03 20:30	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.25
10/13/03 20:35	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.25
10/13/03 20:40	3.00	799.00	0.29	0.44	10.07	806.07	0.30	0.46	3.24
10/13/03 20:45	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.46	3.24
10/13/03 20:50	3.00	799.00	0.29	0.44	10.07	806.07	0.29	0.46	3.24
10/13/03 20:55	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.46	3.24
10/13/03 21:00	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 21:05	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 21:10	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 21:15	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 21:20	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.24
10/13/03 21:25	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 21:30	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 21:35	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 21:40	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 21:45	3.00	799.00	0.28	0.44	10.07	806.07	0.29	0.45	3.23
10/13/03 21:50	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.23
10/13/03 21:55	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.23
10/13/03 22:00	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.23
10/13/03 22:05	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.23
10/13/03 22:10	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 22:15	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 22:20	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 22:25	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 22:30	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.45	3.22
10/13/03 22:35	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 22:40	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 22:45	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 22:50	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.22
10/13/03 22:55	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.21
10/13/03 23:00	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.21
10/13/03 23:05	3.00	799.00	0.28	0.43	10.07	806.07	0.29	0.44	3.21
10/13/03 23:10	3.00	799.00	0.28	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 23:15	3.00	799.00	0.27	0.43	10.07	806.07	0.28	0.44	3.21
10/13/03 23:20	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.21
10/13/03 23:25	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.21
10/13/03 23:30	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.21
10/13/03 23:35	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.21
10/13/03 23:40	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 23:45	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 23:50	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/13/03 23:55	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20
10/14/03 00:00	3.00	799.00	0.27	0.42	10.07	806.07	0.28	0.44	3.20

	4MR Core Project Alterantive - 5-Year, 24-Hour Design Storm (711 and 733 Mon River Stage)								
	PHL Forebay		PHL Forebay Weir		Panther Hollow Lake		PHL Underflow Pipe		
Maximums	3.2	799.2	81.6	126.3	13.1	809.1	29.2	45.2	9.5
Date/Time	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Velocity (fps)
10/07/03 00:05	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:10	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:15	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:20	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:25	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:30	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:35	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:40	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:45	2.01	798.01	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:50	2.02	798.02	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:55	2.03	798.03	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:00	2.04	798.04	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:05	2.05	798.05	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:10	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:15	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:20	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:25	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:30	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:35	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:40	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:45	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:50	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:55	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:00	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:05	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:10	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:15	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:20	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:25	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:30	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:35	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:40	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:45	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:50	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:55	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:00	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:05	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:10	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:15	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:20	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:25	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:30	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:35	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:40	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:45	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:50	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:55	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:00	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:05	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:10	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:20	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:25	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:30	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:35	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:40	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:45	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:50	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:55	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:00	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:05	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:10	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 05:20	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:25	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:30	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:35	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:40	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:45	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:50	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:55	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:00	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:05	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:10	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:15	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:20	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:25	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:30	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:35	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:40	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:45	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:50	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:55	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:00	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:05	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:10	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:15	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:20	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:25	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:30	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:35	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:40	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:45	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:50	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:55	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:00	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:05	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:10	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:15	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:20	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:25	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:30	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:35	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:40	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:45	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:50	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:55	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:00	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:05	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:10	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:15	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:20	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:25	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:30	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:35	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:40	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:45	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:50	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:55	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:00	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:05	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:10	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:15	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:20	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:25	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:30	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:35	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:40	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:45	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:50	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:55	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 11:00	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:05	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:10	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:15	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:20	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:25	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:30	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:35	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:40	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:45	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:50	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:55	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:00	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:05	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:10	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:15	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:20	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:25	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:30	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:35	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:40	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:45	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:50	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:55	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:00	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:05	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:10	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:15	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:20	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:25	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:30	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:35	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:40	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:45	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:50	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:55	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:00	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:05	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:10	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:15	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:20	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:25	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:30	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:35	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:40	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:45	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:50	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:55	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:00	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:05	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:10	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:15	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:20	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:25	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:30	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:35	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:40	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:45	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:50	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:55	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:00	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:05	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:10	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:15	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:20	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:25	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:30	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:35	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 16:40	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:45	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:50	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:55	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:00	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:05	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:10	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:15	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:20	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:25	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:30	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:35	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:40	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:45	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:50	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:55	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:00	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:05	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:10	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:15	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:20	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:25	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:30	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:35	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:40	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:45	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:50	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:55	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:00	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:05	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:10	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:15	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:20	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:25	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:30	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:35	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:40	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:45	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:50	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:55	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:00	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:05	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:10	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:15	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:20	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:25	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:30	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:35	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:40	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:45	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:50	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:55	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:00	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:05	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:10	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:15	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:20	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:25	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:30	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:35	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:40	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:45	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:50	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:55	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:00	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:05	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:10	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:15	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 22:20	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:25	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:30	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:35	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:40	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:45	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:50	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:55	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:00	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:05	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:10	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:15	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:20	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:25	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:30	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:35	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:40	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:45	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:50	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:55	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:00	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:05	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:10	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:15	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:20	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:25	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:30	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:35	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:40	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:45	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:50	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:55	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:00	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:05	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:10	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:15	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:20	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:25	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:30	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:35	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:40	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:45	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:50	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:55	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:00	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:05	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:10	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:15	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:20	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:25	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:30	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:35	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:40	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:45	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:50	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:55	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:00	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:05	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:10	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:15	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:20	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:25	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:30	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:35	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:40	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:45	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:50	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:55	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 04:00	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:05	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:10	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:15	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:20	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:25	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:30	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:35	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:40	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:45	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:50	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:55	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:00	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:05	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:10	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:15	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:20	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:25	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:30	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:35	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:40	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:45	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:50	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:55	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:00	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:05	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:10	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:15	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:20	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:25	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:30	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:35	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:40	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:45	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:50	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:55	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:00	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:05	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:10	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:15	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:20	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:25	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:30	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:35	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:40	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:45	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:50	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:55	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:00	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:05	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:10	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:15	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:20	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:25	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:30	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:35	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:40	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:45	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:50	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:55	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:00	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:05	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:10	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:15	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:20	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:25	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:30	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:35	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 09:40	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:45	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:50	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:55	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:00	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:05	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:10	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:15	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:20	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:25	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:30	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:35	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:40	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:45	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:50	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:55	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:00	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:05	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:10	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:15	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:20	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:25	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:30	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:35	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:40	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:45	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:50	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:55	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:00	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:05	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:10	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:15	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:20	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:25	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:30	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:35	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:40	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:45	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:50	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:55	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:00	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:05	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:10	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:15	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:20	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:25	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:30	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:35	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:40	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:45	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:50	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:55	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:00	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:05	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:10	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:15	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:20	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:25	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:30	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:35	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:40	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:45	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:50	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:55	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:00	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:05	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:10	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:15	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 15:20	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:25	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:30	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:35	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:40	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:45	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:50	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:55	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:00	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:05	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:10	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:15	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:20	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:25	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:30	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:35	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:40	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:45	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:50	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:55	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:00	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:05	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:10	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:15	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:20	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:25	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:30	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:35	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:40	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:45	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:50	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:55	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:00	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:05	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:10	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:15	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:20	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:25	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:30	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:35	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:40	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:45	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:50	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:55	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:00	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:05	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:10	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:15	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:20	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:25	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:30	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:35	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:40	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:45	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:50	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:55	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:00	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:05	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:10	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:15	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:20	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:25	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:30	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:35	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:40	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:45	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:50	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:55	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 21:00	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:05	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:10	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:15	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:20	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:25	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:30	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:35	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:40	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:45	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:50	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:55	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:00	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:05	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:10	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:15	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:20	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:25	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:30	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:35	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:40	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:45	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:50	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:55	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:00	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:05	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:10	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:15	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:20	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:25	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:30	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:35	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:40	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/08/03 23:45	3.00	799.00	0.05	0.08	10.00	806.00	0.00	0.00	0.00
10/08/03 23:50	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/08/03 23:55	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/09/03 00:00	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:05	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:10	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:15	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:20	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:25	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	1.20
10/09/03 00:30	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.25
10/09/03 00:35	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.30
10/09/03 00:40	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.35
10/09/03 00:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.39
10/09/03 00:50	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.43
10/09/03 00:55	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.46
10/09/03 01:00	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.49
10/09/03 01:05	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.52
10/09/03 01:10	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.55
10/09/03 01:15	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.57
10/09/03 01:20	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.59
10/09/03 01:25	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.62
10/09/03 01:30	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.63
10/09/03 01:35	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.65
10/09/03 01:40	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.67
10/09/03 01:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.68
10/09/03 01:50	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.02	1.70
10/09/03 01:55	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.71
10/09/03 02:00	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.72
10/09/03 02:05	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.73
10/09/03 02:10	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.74
10/09/03 02:15	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.75
10/09/03 02:20	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.76
10/09/03 02:25	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:30	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:35	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.78

10/09/03 02:40	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.79
10/09/03 02:45	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.79
10/09/03 02:50	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 02:55	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 03:00	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:05	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:10	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.81
10/09/03 03:15	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.80
10/09/03 03:20	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:25	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:30	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:35	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:40	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:45	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.05	1.80
10/09/03 03:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:05	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:10	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:15	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:20	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:25	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:30	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:35	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.81
10/09/03 04:40	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:45	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.83
10/09/03 04:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.84
10/09/03 05:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.85
10/09/03 05:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.85
10/09/03 05:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.86
10/09/03 05:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.87
10/09/03 05:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.89
10/09/03 05:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:40	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:45	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:50	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:55	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.92
10/09/03 06:00	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 06:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 07:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.03
10/09/03 08:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04

10/09/03 08:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:15	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:20	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:25	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:30	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:35	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:40	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:45	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.08
10/09/03 09:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.10
10/09/03 10:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14

10/09/03 14:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.15
10/09/03 17:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16

10/09/03 19:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 21:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16

10/10/03 01:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:55	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 02:00	3.00	799.00	0.09	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 02:05	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.18
10/10/03 02:10	3.00	799.00	0.10	0.15	10.03	806.03	0.08	0.12	2.18
10/10/03 02:15	3.00	799.00	0.11	0.17	10.03	806.03	0.08	0.12	2.19
10/10/03 02:20	3.00	799.00	0.12	0.18	10.03	806.03	0.08	0.12	2.20
10/10/03 02:25	3.00	799.00	0.12	0.19	10.03	806.03	0.08	0.13	2.21
10/10/03 02:30	3.00	799.00	0.13	0.20	10.03	806.03	0.08	0.13	2.23
10/10/03 02:35	3.00	799.00	0.13	0.21	10.03	806.03	0.08	0.13	2.24
10/10/03 02:40	3.00	799.00	0.14	0.21	10.03	806.03	0.09	0.13	2.25
10/10/03 02:45	3.00	799.00	0.14	0.22	10.03	806.03	0.09	0.14	2.27
10/10/03 02:50	3.00	799.00	0.15	0.23	10.03	806.03	0.09	0.14	2.28
10/10/03 02:55	3.00	799.00	0.15	0.23	10.03	806.03	0.09	0.14	2.30
10/10/03 03:00	3.00	799.00	0.16	0.24	10.03	806.03	0.09	0.15	2.31
10/10/03 03:05	3.00	799.00	0.16	0.25	10.03	806.03	0.10	0.15	2.33
10/10/03 03:10	3.00	799.00	0.16	0.25	10.03	806.03	0.10	0.15	2.35
10/10/03 03:15	3.00	799.00	0.17	0.26	10.03	806.03	0.10	0.16	2.36
10/10/03 03:20	3.00	799.00	0.17	0.27	10.03	806.03	0.10	0.16	2.38
10/10/03 03:25	3.00	799.00	0.18	0.27	10.03	806.03	0.11	0.16	2.39
10/10/03 03:30	3.00	799.00	0.18	0.28	10.03	806.03	0.11	0.17	2.41
10/10/03 03:35	3.00	799.00	0.18	0.29	10.04	806.04	0.11	0.17	2.42
10/10/03 03:40	3.00	799.00	0.19	0.29	10.04	806.04	0.11	0.17	2.44
10/10/03 03:45	3.00	799.00	0.19	0.30	10.04	806.04	0.12	0.18	2.45
10/10/03 03:50	3.00	799.00	0.20	0.31	10.04	806.04	0.12	0.18	2.47
10/10/03 03:55	3.00	799.00	0.20	0.31	10.04	806.04	0.12	0.19	2.48
10/10/03 04:00	3.00	799.00	0.21	0.32	10.04	806.04	0.12	0.19	2.50
10/10/03 04:05	3.00	799.00	0.21	0.33	10.04	806.04	0.13	0.20	2.52
10/10/03 04:10	3.00	799.00	0.22	0.34	10.04	806.04	0.13	0.20	2.53
10/10/03 04:15	3.00	799.00	0.23	0.35	10.04	806.04	0.13	0.21	2.55
10/10/03 04:20	3.00	799.00	0.23	0.36	10.04	806.04	0.14	0.21	2.57
10/10/03 04:25	3.00	799.00	0.24	0.37	10.04	806.04	0.14	0.22	2.59
10/10/03 04:30	3.00	799.00	0.25	0.38	10.04	806.04	0.14	0.22	2.61
10/10/03 04:35	3.00	799.00	0.25	0.39	10.04	806.04	0.15	0.23	2.63
10/10/03 04:40	3.00	799.00	0.26	0.40	10.04	806.04	0.15	0.23	2.65
10/10/03 04:45	3.00	799.00	0.26	0.40	10.04	806.04	0.16	0.24	2.67
10/10/03 04:50	3.00	799.00	0.26	0.41	10.05	806.05	0.16	0.25	2.69
10/10/03 04:55	3.00	799.00	0.27	0.42	10.05	806.05	0.16	0.25	2.71
10/10/03 05:00	3.00	799.00	0.27	0.42	10.05	806.05	0.17	0.26	2.73
10/10/03 05:05	3.00	799.00	0.28	0.43	10.05	806.05	0.17	0.27	2.75
10/10/03 05:10	3.00	799.00	0.28	0.43	10.05	806.05	0.18	0.27	2.77
10/10/03 05:15	3.00	799.00	0.28	0.44	10.05	806.05	0.18	0.28	2.79
10/10/03 05:20	3.00	799.00	0.29	0.45	10.05	806.05	0.18	0.28	2.81
10/10/03 05:25	3.00	799.00	0.29	0.45	10.05	806.05	0.19	0.29	2.83
10/10/03 05:30	3.00	799.00	0.30	0.46	10.05	806.05	0.19	0.30	2.85
10/10/03 05:35	3.00	799.00	0.30	0.47	10.05	806.05	0.20	0.30	2.87
10/10/03 05:40	3.00	799.00	0.31	0.48	10.05	806.05	0.20	0.31	2.89
10/10/03 05:45	3.00	799.00	0.31	0.48	10.05	806.05	0.21	0.32	2.91
10/10/03 05:50	3.00	799.00	0.32	0.49	10.05	806.05	0.21	0.32	2.93
10/10/03 05:55	3.00	799.00	0.32	0.50	10.05	806.05	0.21	0.33	2.95
10/10/03 06:00	3.00	799.00	0.33	0.51	10.06	806.06	0.22	0.34	2.97
10/10/03 06:05	3.00	799.00	0.34	0.52	10.06	806.06	0.22	0.35	2.99
10/10/03 06:10	3.00	799.00	0.34	0.53	10.06	806.06	0.23	0.35	3.02
10/10/03 06:15	3.00	799.00	0.35	0.54	10.06	806.06	0.23	0.36	3.04
10/10/03 06:20	3.00	799.00	0.36	0.55	10.06	806.06	0.24	0.37	3.06
10/10/03 06:25	3.00	799.00	0.37	0.57	10.06	806.06	0.24	0.38	3.08
10/10/03 06:30	3.00	799.00	0.37	0.58	10.06	806.06	0.25	0.39	3.10
10/10/03 06:35	3.00	799.00	0.38	0.58	10.06	806.06	0.25	0.39	3.11
10/10/03 06:40	3.01	799.01	0.38	0.59	10.06	806.06	0.26	0.40	3.13
10/10/03 06:45	3.01	799.01	0.39	0.60	10.06	806.06	0.27	0.41	3.15
10/10/03 06:50	3.01	799.01	0.39	0.61	10.06	806.06	0.27	0.42	3.17
10/10/03 06:55	3.01	799.01	0.40	0.61	10.06	806.06	0.28	0.43	3.18

10/10/03 07:00	3.01	799.01	0.40	0.62	10.07	806.07	0.28	0.44	3.20
10/10/03 07:05	3.01	799.01	0.41	0.63	10.07	806.07	0.29	0.45	3.22
10/10/03 07:10	3.01	799.01	0.41	0.64	10.07	806.07	0.29	0.45	3.24
10/10/03 07:15	3.01	799.01	0.42	0.65	10.07	806.07	0.30	0.46	3.26
10/10/03 07:20	3.01	799.01	0.43	0.66	10.07	806.07	0.31	0.47	3.28
10/10/03 07:25	3.01	799.01	0.43	0.67	10.07	806.07	0.31	0.48	3.29
10/10/03 07:30	3.01	799.01	0.44	0.68	10.07	806.07	0.32	0.49	3.31
10/10/03 07:35	3.01	799.01	0.44	0.69	10.07	806.07	0.32	0.50	3.33
10/10/03 07:40	3.01	799.01	0.45	0.70	10.07	806.07	0.33	0.51	3.35
10/10/03 07:45	3.01	799.01	0.45	0.70	10.07	806.07	0.34	0.52	3.37
10/10/03 07:50	3.01	799.01	0.46	0.71	10.07	806.07	0.34	0.53	3.39
10/10/03 07:55	3.01	799.01	0.47	0.72	10.08	806.08	0.35	0.54	3.40
10/10/03 08:00	3.01	799.01	0.47	0.73	10.08	806.08	0.35	0.55	3.42
10/10/03 08:05	3.01	799.01	0.48	0.75	10.08	806.08	0.36	0.56	3.44
10/10/03 08:10	3.01	799.01	0.49	0.77	10.08	806.08	0.37	0.57	3.46
10/10/03 08:15	3.01	799.01	0.51	0.78	10.08	806.08	0.37	0.58	3.48
10/10/03 08:20	3.01	799.01	0.52	0.80	10.08	806.08	0.38	0.59	3.50
10/10/03 08:25	3.01	799.01	0.53	0.82	10.08	806.08	0.39	0.60	3.52
10/10/03 08:30	3.01	799.01	0.55	0.84	10.08	806.08	0.40	0.61	3.54
10/10/03 08:35	3.01	799.01	0.56	0.87	10.08	806.08	0.40	0.63	3.56
10/10/03 08:40	3.01	799.01	0.58	0.89	10.08	806.08	0.41	0.64	3.59
10/10/03 08:45	3.01	799.01	0.59	0.92	10.09	806.09	0.42	0.65	3.61
10/10/03 08:50	3.01	799.01	0.57	0.89	10.09	806.09	0.43	0.67	3.64
10/10/03 08:55	3.01	799.01	0.61	0.94	10.09	806.09	0.44	0.68	3.66
10/10/03 09:00	3.01	799.01	0.63	0.98	10.09	806.09	0.45	0.69	3.68
10/10/03 09:05	3.01	799.01	0.66	1.02	10.09	806.09	0.46	0.71	3.70
10/10/03 09:10	3.01	799.01	0.68	1.05	10.09	806.09	0.47	0.73	3.72
10/10/03 09:15	3.01	799.01	0.69	1.07	10.09	806.09	0.48	0.74	3.75
10/10/03 09:20	3.01	799.01	0.71	1.10	10.10	806.10	0.49	0.76	3.77
10/10/03 09:25	3.01	799.01	0.73	1.13	10.10	806.10	0.51	0.78	3.80
10/10/03 09:30	3.01	799.01	0.75	1.16	10.10	806.10	0.52	0.80	3.83
10/10/03 09:35	3.01	799.01	0.77	1.19	10.10	806.10	0.53	0.82	3.86
10/10/03 09:40	3.01	799.01	0.79	1.22	10.10	806.10	0.54	0.84	3.89
10/10/03 09:45	3.01	799.01	0.81	1.25	10.10	806.10	0.56	0.86	3.92
10/10/03 09:50	3.01	799.01	0.83	1.28	10.11	806.11	0.57	0.89	3.95
10/10/03 09:55	3.01	799.01	0.84	1.31	10.11	806.11	0.59	0.91	3.98
10/10/03 10:00	3.01	799.01	0.86	1.33	10.11	806.11	0.60	0.93	4.01
10/10/03 10:05	3.01	799.01	0.89	1.38	10.11	806.11	0.62	0.96	4.05
10/10/03 10:10	3.01	799.01	0.92	1.42	10.11	806.11	0.63	0.98	4.08
10/10/03 10:15	3.01	799.01	0.94	1.46	10.11	806.11	0.65	1.01	4.11
10/10/03 10:20	3.01	799.01	0.97	1.50	10.12	806.12	0.67	1.04	4.15
10/10/03 10:25	3.01	799.01	0.99	1.54	10.12	806.12	0.69	1.07	4.18
10/10/03 10:30	3.01	799.01	1.02	1.57	10.12	806.12	0.71	1.10	4.21
10/10/03 10:35	3.01	799.01	1.06	1.64	10.12	806.12	0.73	1.13	4.24
10/10/03 10:40	3.01	799.01	1.10	1.70	10.13	806.13	0.75	1.16	4.27
10/10/03 10:45	3.01	799.01	1.13	1.75	10.13	806.13	0.77	1.20	4.31
10/10/03 10:50	3.01	799.01	1.17	1.81	10.13	806.13	0.80	1.23	4.34
10/10/03 10:55	3.01	799.01	1.19	1.84	10.13	806.13	0.82	1.27	4.38
10/10/03 11:00	3.01	799.01	1.22	1.88	10.14	806.14	0.85	1.31	4.41
10/10/03 11:05	3.01	799.01	1.32	2.04	10.14	806.14	0.88	1.35	4.44
10/10/03 11:10	3.01	799.01	1.41	2.18	10.14	806.14	0.91	1.41	4.50
10/10/03 11:15	3.01	799.01	1.50	2.31	10.15	806.15	0.95	1.46	4.55
10/10/03 11:20	3.01	799.01	1.56	2.41	10.15	806.15	0.99	1.53	4.61
10/10/03 11:25	3.01	799.01	1.62	2.51	10.16	806.16	1.03	1.59	4.67
10/10/03 11:30	3.01	799.01	1.69	2.61	10.16	806.16	1.07	1.66	4.72
10/10/03 11:35	3.02	799.02	2.12	3.27	10.17	806.17	1.13	1.75	4.79
10/10/03 11:40	3.02	799.02	2.55	3.94	10.18	806.18	1.23	1.90	4.90
10/10/03 11:45	3.02	799.02	3.01	4.65	10.19	806.19	1.35	2.08	5.02
10/10/03 11:50	3.03	799.03	6.60	10.21	10.22	806.22	1.61	2.48	5.27
10/10/03 11:55	3.06	799.06	15.59	24.12	10.28	806.28	2.25	3.48	5.76
10/10/03 12:00	3.09	799.09	26.78	41.43	10.40	806.40	3.80	5.88	6.58
10/10/03 12:05	3.10	799.10	32.19	49.81	10.55	806.55	6.47	10.01	7.50
10/10/03 12:10	3.16	799.16	69.00	106.76	10.81	806.81	11.22	17.35	8.44
10/10/03 12:15	3.16	799.16	71.69	110.91	11.12	807.12	17.18	26.57	9.24
10/10/03 12:20	3.18	799.18	81.63	126.30	11.44	807.44	19.51	30.18	9.45
10/10/03 12:25	3.18	799.18	81.50	126.09	11.75	807.75	21.70	33.57	9.32
10/10/03 12:30	3.17	799.17	77.68	120.18	12.04	808.04	23.40	36.21	8.93
10/10/03 12:35	3.16	799.16	71.25	110.23	12.28	808.28	24.81	38.39	8.46

10/10/03 12:40	3.15	799.15	64.06	99.11	12.48	808.48	25.84	39.98	8.29
10/10/03 12:45	3.14	799.14	57.62	89.16	12.63	808.63	26.74	41.37	8.43
10/10/03 12:50	3.13	799.13	52.65	81.46	12.76	808.76	27.42	42.43	8.64
10/10/03 12:55	3.13	799.13	48.70	75.35	12.86	808.86	27.94	43.23	8.81
10/10/03 13:00	3.12	799.12	43.56	67.39	12.94	808.94	28.35	43.86	8.94
10/10/03 13:05	3.12	799.12	42.50	65.75	13.00	809.00	28.64	44.31	9.03
10/10/03 13:10	3.11	799.11	36.89	57.07	13.05	809.05	28.88	44.69	9.10
10/10/03 13:15	3.10	799.10	34.44	53.28	13.08	809.08	29.04	44.94	9.15
10/10/03 13:20	3.10	799.10	31.70	49.04	13.11	809.11	29.15	45.11	9.19
10/10/03 13:25	3.09	799.09	29.43	45.53	13.12	809.12	29.21	45.20	9.21
10/10/03 13:30	3.09	799.09	27.60	42.70	13.12	809.12	29.23	45.23	9.21
10/10/03 13:35	3.08	799.08	25.95	40.15	13.12	809.12	29.22	45.20	9.21
10/10/03 13:40	3.08	799.08	24.50	37.90	13.11	809.11	29.17	45.14	9.19
10/10/03 13:45	3.08	799.08	23.29	36.04	13.09	809.09	29.10	45.03	9.17
10/10/03 13:50	3.08	799.08	22.22	34.38	13.07	809.07	29.01	44.88	9.14
10/10/03 13:55	3.07	799.07	21.16	32.74	13.05	809.05	28.90	44.71	9.11
10/10/03 14:00	3.07	799.07	20.35	31.49	13.02	809.02	28.77	44.51	9.07
10/10/03 14:05	3.07	799.07	19.38	29.98	12.99	808.99	28.62	44.29	9.02
10/10/03 14:10	3.07	799.07	18.60	28.78	12.95	808.95	28.46	44.04	8.97
10/10/03 14:15	3.06	799.06	17.75	27.46	12.92	808.92	28.28	43.76	8.92
10/10/03 14:20	3.06	799.06	16.85	26.08	12.88	808.88	28.09	43.46	8.85
10/10/03 14:25	3.06	799.06	16.22	25.10	12.83	808.83	27.88	43.14	8.79
10/10/03 14:30	3.06	799.06	15.64	24.19	12.79	808.79	27.66	42.80	8.72
10/10/03 14:35	3.06	799.06	14.91	23.07	12.74	808.74	27.43	42.43	8.64
10/10/03 14:40	3.05	799.05	13.67	21.16	12.69	808.69	27.17	42.04	8.56
10/10/03 14:45	3.05	799.05	12.86	19.90	12.64	808.64	26.90	41.62	8.48
10/10/03 14:50	3.05	799.05	11.95	18.48	12.58	808.58	26.61	41.17	8.39
10/10/03 14:55	3.05	799.05	11.39	17.63	12.52	808.52	26.31	40.70	8.29
10/10/03 15:00	3.05	799.05	10.94	16.93	12.46	808.46	26.00	40.23	8.20
10/10/03 15:05	3.05	799.05	10.48	16.22	12.39	808.39	25.87	40.02	8.17
10/10/03 15:10	3.04	799.04	10.09	15.62	12.33	808.33	25.31	39.16	8.33
10/10/03 15:15	3.04	799.04	9.72	15.04	12.26	808.26	24.95	38.61	8.38
10/10/03 15:20	3.04	799.04	9.43	14.59	12.20	808.20	24.59	38.05	8.44
10/10/03 15:25	3.04	799.04	9.16	14.16	12.13	808.13	24.22	37.47	8.51
10/10/03 15:30	3.04	799.04	8.90	13.77	12.07	808.07	23.84	36.89	8.62
10/10/03 15:35	3.04	799.04	8.66	13.39	12.00	808.00	23.46	36.29	8.79
10/10/03 15:40	3.04	799.04	8.41	13.01	11.93	807.93	23.06	35.67	8.96
10/10/03 15:45	3.04	799.04	8.16	12.63	11.87	807.87	22.65	35.05	9.05
10/10/03 15:50	3.04	799.04	7.95	12.29	11.80	807.80	22.25	34.42	9.15
10/10/03 15:55	3.04	799.04	7.76	12.01	11.73	807.73	21.84	33.79	9.23
10/10/03 16:00	3.04	799.04	7.60	11.75	11.67	807.67	21.42	33.15	9.31
10/10/03 16:05	3.04	799.04	7.40	11.45	11.60	807.60	21.01	32.50	9.39
10/10/03 16:10	3.04	799.04	7.18	11.11	11.54	807.54	20.59	31.86	9.47
10/10/03 16:15	3.03	799.03	6.97	10.78	11.48	807.48	20.18	31.23	9.52
10/10/03 16:20	3.03	799.03	6.76	10.46	11.42	807.42	19.76	30.57	9.49
10/10/03 16:25	3.03	799.03	6.55	10.14	11.35	807.35	19.32	29.90	9.46
10/10/03 16:30	3.03	799.03	6.35	9.82	11.29	807.29	18.88	29.22	9.42
10/10/03 16:35	3.03	799.03	6.27	9.70	11.23	807.23	18.44	28.53	9.38
10/10/03 16:40	3.03	799.03	5.97	9.23	11.17	807.17	18.00	27.84	9.34
10/10/03 16:45	3.03	799.03	5.78	8.95	11.12	807.12	17.55	27.15	9.30
10/10/03 16:50	3.03	799.03	5.60	8.67	11.06	807.06	17.09	26.45	9.25
10/10/03 16:55	3.03	799.03	5.43	8.40	11.00	807.00	16.63	25.74	9.21
10/10/03 17:00	3.03	799.03	5.29	8.18	10.95	806.95	15.76	24.38	9.12
10/10/03 17:05	3.03	799.03	5.16	7.99	10.90	806.90	14.54	22.50	8.98
10/10/03 17:10	3.03	799.03	5.04	7.79	10.85	806.85	13.48	20.85	8.85
10/10/03 17:15	3.03	799.03	4.91	7.59	10.81	806.81	12.54	19.40	8.72
10/10/03 17:20	3.03	799.03	4.77	7.37	10.78	806.78	11.71	18.11	8.60
10/10/03 17:25	3.03	799.03	4.62	7.15	10.75	806.75	10.97	16.97	8.48
10/10/03 17:30	3.03	799.03	4.47	6.91	10.72	806.72	10.30	15.93	8.37
10/10/03 17:35	3.03	799.03	4.32	6.69	10.69	806.69	9.70	15.00	8.26
10/10/03 17:40	3.02	799.02	4.19	6.48	10.66	806.66	9.15	14.16	8.16
10/10/03 17:45	3.02	799.02	4.07	6.29	10.64	806.64	8.66	13.40	8.06
10/10/03 17:50	3.02	799.02	3.96	6.13	10.62	806.62	8.21	12.70	7.96
10/10/03 17:55	3.02	799.02	3.87	5.99	10.59	806.59	7.80	12.07	7.87
10/10/03 18:00	3.02	799.02	3.79	5.86	10.58	806.58	7.43	11.49	7.78
10/10/03 18:05	3.02	799.02	3.71	5.74	10.56	806.56	7.09	10.97	7.70
10/10/03 18:10	3.02	799.02	3.65	5.64	10.54	806.54	6.78	10.49	7.62
10/10/03 18:15	3.02	799.02	3.59	5.56	10.53	806.53	6.50	10.05	7.54

10/10/03 18:20	3.02	799.02	3.55	5.49	10.51	806.51	6.24	9.65	7.47
10/10/03 18:25	3.02	799.02	3.51	5.43	10.50	806.50	6.00	9.29	7.40
10/10/03 18:30	3.02	799.02	3.45	5.34	10.49	806.49	5.79	8.96	7.34
10/10/03 18:35	3.02	799.02	3.38	5.23	10.48	806.48	5.59	8.65	7.28
10/10/03 18:40	3.02	799.02	3.30	5.11	10.47	806.47	5.40	8.36	7.22
10/10/03 18:45	3.02	799.02	3.23	5.00	10.46	806.46	5.23	8.09	7.16
10/10/03 18:50	3.02	799.02	3.17	4.91	10.45	806.45	5.06	7.83	7.11
10/10/03 18:55	3.02	799.02	3.12	4.83	10.44	806.44	4.91	7.59	7.05
10/10/03 19:00	3.02	799.02	3.07	4.75	10.43	806.43	4.76	7.37	7.00
10/10/03 19:05	3.02	799.02	3.03	4.68	10.42	806.42	4.63	7.16	6.95
10/10/03 19:10	3.02	799.02	2.98	4.62	10.41	806.41	4.50	6.97	6.91
10/10/03 19:15	3.02	799.02	2.96	4.58	10.41	806.41	4.39	6.78	6.86
10/10/03 19:20	3.02	799.02	2.90	4.49	10.40	806.40	4.27	6.61	6.82
10/10/03 19:25	3.02	799.02	2.87	4.44	10.39	806.39	4.17	6.45	6.77
10/10/03 19:30	3.02	799.02	2.83	4.38	10.39	806.39	4.07	6.30	6.74
10/10/03 19:35	3.02	799.02	2.80	4.33	10.38	806.38	3.98	6.16	6.70
10/10/03 19:40	3.02	799.02	2.77	4.28	10.38	806.38	3.89	6.02	6.66
10/10/03 19:45	3.02	799.02	2.73	4.23	10.37	806.37	3.81	5.89	6.63
10/10/03 19:50	3.02	799.02	2.70	4.18	10.36	806.36	3.73	5.77	6.59
10/10/03 19:55	3.02	799.02	2.68	4.14	10.36	806.36	3.66	5.66	6.56
10/10/03 20:00	3.02	799.02	2.65	4.10	10.36	806.36	3.59	5.55	6.52
10/10/03 20:05	3.02	799.02	2.60	4.03	10.35	806.35	3.52	5.45	6.49
10/10/03 20:10	3.02	799.02	2.56	3.95	10.35	806.35	3.45	5.34	6.46
10/10/03 20:15	3.02	799.02	2.51	3.88	10.34	806.34	3.39	5.25	6.43
10/10/03 20:20	3.02	799.02	2.47	3.81	10.34	806.34	3.33	5.15	6.40
10/10/03 20:25	3.02	799.02	2.42	3.74	10.33	806.33	3.27	5.05	6.37
10/10/03 20:30	3.02	799.02	2.38	3.68	10.33	806.33	3.21	4.96	6.34
10/10/03 20:35	3.02	799.02	2.33	3.61	10.33	806.33	3.15	4.87	6.31
10/10/03 20:40	3.02	799.02	2.29	3.54	10.32	806.32	3.09	4.78	6.28
10/10/03 20:45	3.02	799.02	2.25	3.48	10.32	806.32	3.03	4.69	6.25
10/10/03 20:50	3.02	799.02	2.21	3.41	10.31	806.31	2.98	4.61	6.22
10/10/03 20:55	3.02	799.02	2.16	3.35	10.31	806.31	2.92	4.52	6.19
10/10/03 21:00	3.02	799.02	2.12	3.29	10.31	806.31	2.87	4.44	6.16
10/10/03 21:05	3.02	799.02	2.08	3.22	10.30	806.30	2.82	4.36	6.13
10/10/03 21:10	3.02	799.02	2.04	3.16	10.30	806.30	2.77	4.28	6.11
10/10/03 21:15	3.02	799.02	2.01	3.10	10.30	806.30	2.72	4.20	6.08
10/10/03 21:20	3.01	799.01	1.97	3.05	10.29	806.29	2.67	4.13	6.05
10/10/03 21:25	3.01	799.01	1.94	3.01	10.29	806.29	2.62	4.05	6.02
10/10/03 21:30	3.01	799.01	1.91	2.96	10.28	806.28	2.57	3.98	5.99
10/10/03 21:35	3.01	799.01	1.88	2.90	10.28	806.28	2.53	3.91	5.96
10/10/03 21:40	3.01	799.01	1.84	2.85	10.28	806.28	2.48	3.84	5.93
10/10/03 21:45	3.01	799.01	1.81	2.79	10.27	806.27	2.44	3.78	5.91
10/10/03 21:50	3.01	799.01	1.77	2.74	10.27	806.27	2.40	3.71	5.88
10/10/03 21:55	3.01	799.01	1.75	2.70	10.27	806.27	2.36	3.65	5.85
10/10/03 22:00	3.01	799.01	1.72	2.66	10.27	806.27	2.32	3.58	5.82
10/10/03 22:05	3.01	799.01	1.69	2.62	10.26	806.26	2.28	3.52	5.80
10/10/03 22:10	3.01	799.01	1.67	2.58	10.26	806.26	2.24	3.46	5.78
10/10/03 22:15	3.01	799.01	1.65	2.55	10.26	806.26	2.20	3.40	5.75
10/10/03 22:20	3.01	799.01	1.63	2.52	10.25	806.25	2.16	3.35	5.72
10/10/03 22:25	3.01	799.01	1.61	2.49	10.25	806.25	2.13	3.29	5.70
10/10/03 22:30	3.01	799.01	1.59	2.46	10.25	806.25	2.09	3.24	5.67
10/10/03 22:35	3.01	799.01	1.57	2.43	10.25	806.25	2.06	3.19	5.65
10/10/03 22:40	3.01	799.01	1.55	2.40	10.24	806.24	2.03	3.14	5.62
10/10/03 22:45	3.01	799.01	1.53	2.37	10.24	806.24	2.00	3.09	5.60
10/10/03 22:50	3.01	799.01	1.51	2.34	10.24	806.24	1.97	3.05	5.58
10/10/03 22:55	3.01	799.01	1.50	2.31	10.24	806.24	1.94	3.00	5.56
10/10/03 23:00	3.01	799.01	1.48	2.29	10.23	806.23	1.91	2.96	5.53
10/10/03 23:05	3.01	799.01	1.47	2.27	10.23	806.23	1.89	2.92	5.51
10/10/03 23:10	3.01	799.01	1.45	2.25	10.23	806.23	1.86	2.88	5.49
10/10/03 23:15	3.01	799.01	1.44	2.23	10.23	806.23	1.83	2.84	5.47
10/10/03 23:20	3.01	799.01	1.43	2.21	10.23	806.23	1.81	2.80	5.45
10/10/03 23:25	3.01	799.01	1.42	2.19	10.22	806.22	1.79	2.76	5.43
10/10/03 23:30	3.01	799.01	1.40	2.17	10.22	806.22	1.76	2.73	5.41
10/10/03 23:35	3.01	799.01	1.40	2.16	10.22	806.22	1.74	2.69	5.40
10/10/03 23:40	3.01	799.01	1.39	2.15	10.22	806.22	1.72	2.66	5.38
10/10/03 23:45	3.01	799.01	1.38	2.13	10.22	806.22	1.70	2.63	5.36
10/10/03 23:50	3.01	799.01	1.37	2.12	10.21	806.21	1.68	2.60	5.35
10/10/03 23:55	3.01	799.01	1.36	2.10	10.21	806.21	1.66	2.57	5.33

10/11/03 00:00	3.01	799.01	1.35	2.09	10.21	806.21	1.64	2.54	5.31
10/11/03 00:05	3.01	799.01	1.32	2.04	10.21	806.21	1.63	2.52	5.30
10/11/03 00:10	3.01	799.01	1.29	2.00	10.21	806.21	1.61	2.49	5.28
10/11/03 00:15	3.01	799.01	1.27	1.96	10.21	806.21	1.59	2.46	5.26
10/11/03 00:20	3.01	799.01	1.25	1.93	10.20	806.20	1.57	2.42	5.25
10/11/03 00:25	3.01	799.01	1.23	1.90	10.20	806.20	1.55	2.39	5.23
10/11/03 00:30	3.01	799.01	1.21	1.87	10.20	806.20	1.53	2.36	5.21
10/11/03 00:35	3.01	799.01	1.20	1.85	10.20	806.20	1.51	2.33	5.19
10/11/03 00:40	3.01	799.01	1.18	1.83	10.20	806.20	1.49	2.30	5.17
10/11/03 00:45	3.01	799.01	1.17	1.81	10.20	806.20	1.47	2.27	5.15
10/11/03 00:50	3.01	799.01	1.16	1.79	10.19	806.19	1.45	2.25	5.14
10/11/03 00:55	3.01	799.01	1.15	1.78	10.19	806.19	1.43	2.22	5.12
10/11/03 01:00	3.01	799.01	1.14	1.76	10.19	806.19	1.42	2.19	5.10
10/11/03 01:05	3.01	799.01	1.13	1.74	10.19	806.19	1.40	2.17	5.08
10/11/03 01:10	3.01	799.01	1.12	1.73	10.19	806.19	1.38	2.14	5.07
10/11/03 01:15	3.01	799.01	1.11	1.72	10.19	806.19	1.37	2.12	5.05
10/11/03 01:20	3.01	799.01	1.10	1.70	10.19	806.19	1.35	2.09	5.03
10/11/03 01:25	3.01	799.01	1.09	1.69	10.18	806.18	1.34	2.07	5.02
10/11/03 01:30	3.01	799.01	1.08	1.67	10.18	806.18	1.32	2.05	5.00
10/11/03 01:35	3.01	799.01	1.07	1.66	10.18	806.18	1.31	2.02	4.98
10/11/03 01:40	3.01	799.01	1.06	1.65	10.18	806.18	1.29	2.00	4.97
10/11/03 01:45	3.01	799.01	1.06	1.63	10.18	806.18	1.28	1.98	4.96
10/11/03 01:50	3.01	799.01	1.05	1.62	10.18	806.18	1.27	1.96	4.94
10/11/03 01:55	3.01	799.01	1.04	1.61	10.18	806.18	1.25	1.94	4.93
10/11/03 02:00	3.01	799.01	1.03	1.60	10.18	806.18	1.24	1.92	4.92
10/11/03 02:05	3.01	799.01	1.02	1.58	10.17	806.17	1.23	1.90	4.90
10/11/03 02:10	3.01	799.01	1.02	1.57	10.17	806.17	1.22	1.88	4.89
10/11/03 02:15	3.01	799.01	1.01	1.56	10.17	806.17	1.21	1.87	4.88
10/11/03 02:20	3.01	799.01	1.00	1.55	10.17	806.17	1.19	1.85	4.87
10/11/03 02:25	3.01	799.01	0.99	1.54	10.17	806.17	1.18	1.83	4.85
10/11/03 02:30	3.01	799.01	0.99	1.53	10.17	806.17	1.17	1.81	4.84
10/11/03 02:35	3.01	799.01	0.98	1.52	10.17	806.17	1.16	1.80	4.83
10/11/03 02:40	3.01	799.01	0.97	1.51	10.17	806.17	1.15	1.78	4.82
10/11/03 02:45	3.01	799.01	0.97	1.50	10.17	806.17	1.14	1.77	4.81
10/11/03 02:50	3.01	799.01	0.96	1.49	10.16	806.16	1.13	1.75	4.79
10/11/03 02:55	3.01	799.01	0.96	1.48	10.16	806.16	1.12	1.74	4.78
10/11/03 03:00	3.01	799.01	0.96	1.48	10.16	806.16	1.11	1.72	4.77
10/11/03 03:05	3.01	799.01	0.95	1.47	10.16	806.16	1.10	1.71	4.76
10/11/03 03:10	3.01	799.01	0.95	1.47	10.16	806.16	1.10	1.70	4.75
10/11/03 03:15	3.01	799.01	0.94	1.46	10.16	806.16	1.09	1.68	4.74
10/11/03 03:20	3.01	799.01	0.94	1.46	10.16	806.16	1.08	1.67	4.73
10/11/03 03:25	3.01	799.01	0.94	1.45	10.16	806.16	1.07	1.66	4.72
10/11/03 03:30	3.01	799.01	0.94	1.45	10.16	806.16	1.06	1.65	4.72
10/11/03 03:35	3.01	799.01	0.93	1.44	10.16	806.16	1.06	1.64	4.71
10/11/03 03:40	3.01	799.01	0.93	1.44	10.16	806.16	1.05	1.63	4.70
10/11/03 03:45	3.01	799.01	0.93	1.44	10.16	806.16	1.04	1.62	4.69
10/11/03 03:50	3.01	799.01	0.93	1.43	10.16	806.16	1.04	1.61	4.68
10/11/03 03:55	3.01	799.01	0.93	1.43	10.16	806.16	1.03	1.60	4.68
10/11/03 04:00	3.01	799.01	0.92	1.43	10.15	806.15	1.03	1.59	4.67
10/11/03 04:05	3.01	799.01	0.92	1.43	10.15	806.15	1.02	1.58	4.66
10/11/03 04:10	3.01	799.01	0.92	1.43	10.15	806.15	1.02	1.57	4.65
10/11/03 04:15	3.01	799.01	0.92	1.42	10.15	806.15	1.01	1.56	4.65
10/11/03 04:20	3.01	799.01	0.92	1.42	10.15	806.15	1.01	1.56	4.64
10/11/03 04:25	3.01	799.01	0.92	1.42	10.15	806.15	1.00	1.55	4.64
10/11/03 04:30	3.01	799.01	0.92	1.42	10.15	806.15	1.00	1.54	4.63
10/11/03 04:35	3.01	799.01	0.92	1.42	10.15	806.15	0.99	1.53	4.62
10/11/03 04:40	3.01	799.01	0.92	1.42	10.15	806.15	0.99	1.53	4.62
10/11/03 04:45	3.01	799.01	0.91	1.41	10.15	806.15	0.98	1.52	4.61
10/11/03 04:50	3.01	799.01	0.91	1.41	10.15	806.15	0.98	1.52	4.61
10/11/03 04:55	3.01	799.01	0.91	1.41	10.15	806.15	0.98	1.51	4.60
10/11/03 05:00	3.01	799.01	0.91	1.41	10.15	806.15	0.97	1.51	4.60
10/11/03 05:05	3.01	799.01	0.91	1.41	10.15	806.15	0.97	1.50	4.59
10/11/03 05:10	3.01	799.01	0.91	1.41	10.15	806.15	0.97	1.50	4.59
10/11/03 05:15	3.01	799.01	0.91	1.41	10.15	806.15	0.96	1.49	4.58
10/11/03 05:20	3.01	799.01	0.91	1.41	10.15	806.15	0.96	1.49	4.58
10/11/03 05:25	3.01	799.01	0.91	1.41	10.15	806.15	0.96	1.48	4.57
10/11/03 05:30	3.01	799.01	0.91	1.41	10.15	806.15	0.96	1.48	4.57
10/11/03 05:35	3.01	799.01	0.91	1.40	10.15	806.15	0.95	1.47	4.57

10/11/03 05:40	3.01	799.01	0.91	1.40	10.15	806.15	0.95	1.47	4.56
10/11/03 05:45	3.01	799.01	0.91	1.40	10.15	806.15	0.95	1.47	4.56
10/11/03 05:50	3.01	799.01	0.91	1.40	10.15	806.15	0.95	1.46	4.56
10/11/03 05:55	3.01	799.01	0.91	1.40	10.15	806.15	0.94	1.46	4.55
10/11/03 06:00	3.01	799.01	0.90	1.40	10.15	806.15	0.94	1.46	4.55
10/11/03 06:05	3.01	799.01	0.90	1.40	10.15	806.15	0.94	1.45	4.55
10/11/03 06:10	3.01	799.01	0.90	1.40	10.15	806.15	0.94	1.45	4.54
10/11/03 06:15	3.01	799.01	0.90	1.40	10.15	806.15	0.94	1.45	4.54
10/11/03 06:20	3.01	799.01	0.90	1.40	10.15	806.15	0.93	1.45	4.54
10/11/03 06:25	3.01	799.01	0.90	1.39	10.15	806.15	0.93	1.44	4.53
10/11/03 06:30	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.44	4.53
10/11/03 06:35	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.44	4.53
10/11/03 06:40	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.44	4.53
10/11/03 06:45	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.43	4.53
10/11/03 06:50	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.43	4.52
10/11/03 06:55	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.43	4.52
10/11/03 07:00	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.43	4.52
10/11/03 07:05	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.42	4.52
10/11/03 07:10	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.42	4.51
10/11/03 07:15	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.42	4.51
10/11/03 07:20	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.42	4.51
10/11/03 07:25	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.42	4.51
10/11/03 07:30	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.51
10/11/03 07:35	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.50
10/11/03 07:40	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.41	4.50
10/11/03 07:45	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.41	4.50
10/11/03 07:50	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.41	4.50
10/11/03 07:55	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.40	4.50
10/11/03 08:00	3.01	799.01	0.88	1.37	10.14	806.14	0.91	1.40	4.50
10/11/03 08:05	3.01	799.01	0.88	1.37	10.14	806.14	0.91	1.40	4.49
10/11/03 08:10	3.01	799.01	0.88	1.37	10.14	806.14	0.90	1.40	4.49
10/11/03 08:15	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.40	4.49
10/11/03 08:20	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.40	4.49
10/11/03 08:25	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.49
10/11/03 08:30	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/11/03 08:35	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/11/03 08:40	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/11/03 08:45	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/11/03 08:50	3.01	799.01	0.88	1.35	10.14	806.14	0.90	1.39	4.48
10/11/03 08:55	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.48
10/11/03 09:00	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/11/03 09:05	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/11/03 09:10	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/11/03 09:15	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/11/03 09:20	3.01	799.01	0.87	1.34	10.14	806.14	0.89	1.38	4.47
10/11/03 09:25	3.01	799.01	0.87	1.34	10.14	806.14	0.89	1.37	4.47
10/11/03 09:30	3.01	799.01	0.87	1.34	10.14	806.14	0.89	1.37	4.46
10/11/03 09:35	3.01	799.01	0.87	1.34	10.14	806.14	0.89	1.37	4.46
10/11/03 09:40	3.01	799.01	0.86	1.34	10.14	806.14	0.89	1.37	4.46
10/11/03 09:45	3.01	799.01	0.86	1.34	10.14	806.14	0.88	1.37	4.46
10/11/03 09:50	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.37	4.46
10/11/03 09:55	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.46
10/11/03 10:00	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/11/03 10:05	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/11/03 10:10	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/11/03 10:15	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/11/03 10:20	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/11/03 10:25	3.01	799.01	0.86	1.32	10.14	806.14	0.88	1.35	4.45
10/11/03 10:30	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/11/03 10:35	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/11/03 10:40	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/11/03 10:45	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/11/03 10:50	3.01	799.01	0.85	1.31	10.14	806.14	0.87	1.35	4.44
10/11/03 10:55	3.01	799.01	0.85	1.31	10.14	806.14	0.87	1.34	4.44
10/11/03 11:00	3.01	799.01	0.85	1.31	10.14	806.14	0.87	1.34	4.44
10/11/03 11:05	3.01	799.01	0.85	1.31	10.14	806.14	0.87	1.34	4.43
10/11/03 11:10	3.01	799.01	0.85	1.31	10.14	806.14	0.87	1.34	4.43
10/11/03 11:15	3.01	799.01	0.84	1.31	10.14	806.14	0.86	1.34	4.43

10/11/03 11:20	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.34	4.43
10/11/03 11:25	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.43
10/11/03 11:30	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.43
10/11/03 11:35	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.43
10/11/03 11:40	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.42
10/11/03 11:45	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.42
10/11/03 11:50	3.01	799.01	0.84	1.29	10.14	806.14	0.86	1.33	4.42
10/11/03 11:55	3.01	799.01	0.84	1.29	10.14	806.14	0.86	1.32	4.42
10/11/03 12:00	3.01	799.01	0.83	1.29	10.14	806.14	0.86	1.32	4.42
10/11/03 12:05	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.32	4.42
10/11/03 12:10	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.32	4.42
10/11/03 12:15	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.32	4.41
10/11/03 12:20	3.01	799.01	0.83	1.28	10.14	806.14	0.85	1.32	4.41
10/11/03 12:25	3.01	799.01	0.83	1.28	10.14	806.14	0.85	1.31	4.41
10/11/03 12:30	3.01	799.01	0.83	1.28	10.14	806.14	0.85	1.31	4.41
10/11/03 12:35	3.01	799.01	0.83	1.28	10.14	806.14	0.85	1.31	4.41
10/11/03 12:40	3.01	799.01	0.83	1.28	10.14	806.14	0.85	1.31	4.41
10/11/03 12:45	3.01	799.01	0.82	1.28	10.14	806.14	0.85	1.31	4.41
10/11/03 12:50	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.31	4.40
10/11/03 12:55	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.30	4.40
10/11/03 13:00	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.30	4.40
10/11/03 13:05	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.30	4.40
10/11/03 13:10	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.30	4.40
10/11/03 13:15	3.01	799.01	0.82	1.26	10.14	806.14	0.84	1.30	4.40
10/11/03 13:20	3.01	799.01	0.82	1.26	10.14	806.14	0.84	1.30	4.40
10/11/03 13:25	3.01	799.01	0.81	1.26	10.13	806.13	0.84	1.29	4.39
10/11/03 13:30	3.01	799.01	0.81	1.26	10.13	806.13	0.84	1.29	4.39
10/11/03 13:35	3.01	799.01	0.81	1.26	10.13	806.13	0.83	1.29	4.39
10/11/03 13:40	3.01	799.01	0.81	1.25	10.13	806.13	0.83	1.29	4.39
10/11/03 13:45	3.01	799.01	0.81	1.25	10.13	806.13	0.83	1.29	4.39
10/11/03 13:50	3.01	799.01	0.81	1.25	10.13	806.13	0.83	1.29	4.39
10/11/03 13:55	3.01	799.01	0.81	1.25	10.13	806.13	0.83	1.28	4.39
10/11/03 14:00	3.01	799.01	0.80	1.24	10.13	806.13	0.83	1.28	4.38
10/11/03 14:05	3.01	799.01	0.80	1.24	10.13	806.13	0.83	1.28	4.38
10/11/03 14:10	3.01	799.01	0.80	1.24	10.13	806.13	0.83	1.28	4.38
10/11/03 14:15	3.01	799.01	0.80	1.24	10.13	806.13	0.82	1.28	4.38
10/11/03 14:20	3.01	799.01	0.80	1.23	10.13	806.13	0.82	1.27	4.38
10/11/03 14:25	3.01	799.01	0.80	1.23	10.13	806.13	0.82	1.27	4.38
10/11/03 14:30	3.01	799.01	0.79	1.23	10.13	806.13	0.82	1.27	4.37
10/11/03 14:35	3.01	799.01	0.79	1.23	10.13	806.13	0.82	1.27	4.37
10/11/03 14:40	3.01	799.01	0.79	1.22	10.13	806.13	0.82	1.27	4.37
10/11/03 14:45	3.01	799.01	0.79	1.22	10.13	806.13	0.82	1.26	4.37
10/11/03 14:50	3.01	799.01	0.79	1.22	10.13	806.13	0.82	1.26	4.37
10/11/03 14:55	3.01	799.01	0.79	1.22	10.13	806.13	0.81	1.26	4.36
10/11/03 15:00	3.01	799.01	0.78	1.21	10.13	806.13	0.81	1.26	4.36
10/11/03 15:05	3.01	799.01	0.78	1.21	10.13	806.13	0.81	1.25	4.36
10/11/03 15:10	3.01	799.01	0.78	1.21	10.13	806.13	0.81	1.25	4.36
10/11/03 15:15	3.01	799.01	0.78	1.20	10.13	806.13	0.81	1.25	4.36
10/11/03 15:20	3.01	799.01	0.78	1.20	10.13	806.13	0.81	1.25	4.35
10/11/03 15:25	3.01	799.01	0.77	1.20	10.13	806.13	0.80	1.25	4.35
10/11/03 15:30	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.35
10/11/03 15:35	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.35
10/11/03 15:40	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.35
10/11/03 15:45	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.34
10/11/03 15:50	3.01	799.01	0.76	1.18	10.13	806.13	0.80	1.23	4.34
10/11/03 15:55	3.01	799.01	0.76	1.18	10.13	806.13	0.80	1.23	4.34
10/11/03 16:00	3.01	799.01	0.76	1.18	10.13	806.13	0.79	1.23	4.34
10/11/03 16:05	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.23	4.33
10/11/03 16:10	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.22	4.33
10/11/03 16:15	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.22	4.33
10/11/03 16:20	3.01	799.01	0.75	1.17	10.13	806.13	0.79	1.22	4.33
10/11/03 16:25	3.01	799.01	0.75	1.17	10.13	806.13	0.79	1.21	4.32
10/11/03 16:30	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.21	4.32
10/11/03 16:35	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.21	4.32
10/11/03 16:40	3.01	799.01	0.74	1.15	10.13	806.13	0.78	1.21	4.32
10/11/03 16:45	3.01	799.01	0.74	1.15	10.13	806.13	0.78	1.20	4.32
10/11/03 16:50	3.01	799.01	0.74	1.14	10.13	806.13	0.78	1.20	4.31
10/11/03 16:55	3.01	799.01	0.74	1.14	10.13	806.13	0.77	1.20	4.31

10/11/03 17:00	3.01	799.01	0.73	1.14	10.13	806.13	0.77	1.20	4.31
10/11/03 17:05	3.01	799.01	0.73	1.13	10.13	806.13	0.77	1.19	4.30
10/11/03 17:10	3.01	799.01	0.73	1.13	10.13	806.13	0.77	1.19	4.30
10/11/03 17:15	3.01	799.01	0.73	1.12	10.13	806.13	0.77	1.19	4.30
10/11/03 17:20	3.01	799.01	0.72	1.12	10.13	806.13	0.76	1.18	4.30
10/11/03 17:25	3.01	799.01	0.72	1.12	10.13	806.13	0.76	1.18	4.29
10/11/03 17:30	3.01	799.01	0.72	1.11	10.13	806.13	0.76	1.18	4.29
10/11/03 17:35	3.01	799.01	0.72	1.11	10.13	806.13	0.76	1.17	4.29
10/11/03 17:40	3.01	799.01	0.72	1.11	10.13	806.13	0.76	1.17	4.28
10/11/03 17:45	3.01	799.01	0.71	1.10	10.13	806.13	0.75	1.17	4.28
10/11/03 17:50	3.01	799.01	0.71	1.10	10.13	806.13	0.75	1.16	4.28
10/11/03 17:55	3.01	799.01	0.71	1.10	10.13	806.13	0.75	1.16	4.28
10/11/03 18:00	3.01	799.01	0.71	1.09	10.13	806.13	0.75	1.16	4.27
10/11/03 18:05	3.01	799.01	0.70	1.09	10.13	806.13	0.75	1.15	4.27
10/11/03 18:10	3.01	799.01	0.70	1.08	10.12	806.12	0.74	1.15	4.27
10/11/03 18:15	3.01	799.01	0.70	1.08	10.12	806.12	0.74	1.15	4.26
10/11/03 18:20	3.01	799.01	0.70	1.08	10.12	806.12	0.74	1.14	4.26
10/11/03 18:25	3.01	799.01	0.69	1.07	10.12	806.12	0.74	1.14	4.26
10/11/03 18:30	3.01	799.01	0.69	1.07	10.12	806.12	0.74	1.14	4.25
10/11/03 18:35	3.01	799.01	0.69	1.07	10.12	806.12	0.73	1.13	4.25
10/11/03 18:40	3.01	799.01	0.69	1.06	10.12	806.12	0.73	1.13	4.25
10/11/03 18:45	3.01	799.01	0.69	1.06	10.12	806.12	0.73	1.13	4.24
10/11/03 18:50	3.01	799.01	0.68	1.06	10.12	806.12	0.73	1.12	4.24
10/11/03 18:55	3.01	799.01	0.68	1.05	10.12	806.12	0.72	1.12	4.24
10/11/03 19:00	3.01	799.01	0.68	1.05	10.12	806.12	0.72	1.12	4.23
10/11/03 19:05	3.01	799.01	0.68	1.05	10.12	806.12	0.72	1.11	4.23
10/11/03 19:10	3.01	799.01	0.68	1.05	10.12	806.12	0.72	1.11	4.23
10/11/03 19:15	3.01	799.01	0.68	1.04	10.12	806.12	0.72	1.11	4.22
10/11/03 19:20	3.01	799.01	0.67	1.04	10.12	806.12	0.71	1.11	4.22
10/11/03 19:25	3.01	799.01	0.67	1.04	10.12	806.12	0.71	1.10	4.22
10/11/03 19:30	3.01	799.01	0.67	1.03	10.12	806.12	0.71	1.10	4.22
10/11/03 19:35	3.01	799.01	0.66	1.03	10.12	806.12	0.71	1.10	4.21
10/11/03 19:40	3.01	799.01	0.66	1.02	10.12	806.12	0.71	1.09	4.21
10/11/03 19:45	3.01	799.01	0.66	1.02	10.12	806.12	0.70	1.09	4.21
10/11/03 19:50	3.01	799.01	0.66	1.02	10.12	806.12	0.70	1.09	4.20
10/11/03 19:55	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.08	4.20
10/11/03 20:00	3.01	799.01	0.65	1.01	10.12	806.12	0.70	1.08	4.20
10/11/03 20:05	3.01	799.01	0.65	1.00	10.12	806.12	0.70	1.08	4.19
10/11/03 20:10	3.01	799.01	0.65	1.00	10.12	806.12	0.69	1.07	4.19
10/11/03 20:15	3.01	799.01	0.65	1.00	10.12	806.12	0.69	1.07	4.18
10/11/03 20:20	3.01	799.01	0.64	1.00	10.12	806.12	0.69	1.07	4.18
10/11/03 20:25	3.01	799.01	0.64	0.99	10.12	806.12	0.69	1.06	4.18
10/11/03 20:30	3.01	799.01	0.64	0.99	10.12	806.12	0.68	1.06	4.17
10/11/03 20:35	3.01	799.01	0.64	0.99	10.12	806.12	0.68	1.06	4.17
10/11/03 20:40	3.01	799.01	0.64	0.98	10.12	806.12	0.68	1.05	4.16
10/11/03 20:45	3.01	799.01	0.63	0.98	10.12	806.12	0.68	1.05	4.16
10/11/03 20:50	3.01	799.01	0.63	0.98	10.12	806.12	0.68	1.05	4.16
10/11/03 20:55	3.01	799.01	0.63	0.98	10.12	806.12	0.67	1.04	4.15
10/11/03 21:00	3.01	799.01	0.63	0.97	10.12	806.12	0.67	1.04	4.15
10/11/03 21:05	3.01	799.01	0.63	0.97	10.12	806.12	0.67	1.04	4.15
10/11/03 21:10	3.01	799.01	0.63	0.97	10.12	806.12	0.67	1.03	4.14
10/11/03 21:15	3.01	799.01	0.62	0.97	10.12	806.12	0.67	1.03	4.14
10/11/03 21:20	3.01	799.01	0.62	0.96	10.12	806.12	0.66	1.03	4.13
10/11/03 21:25	3.01	799.01	0.62	0.96	10.12	806.12	0.66	1.02	4.13
10/11/03 21:30	3.01	799.01	0.62	0.96	10.12	806.12	0.66	1.02	4.13
10/11/03 21:35	3.01	799.01	0.62	0.96	10.11	806.11	0.66	1.02	4.12
10/11/03 21:40	3.01	799.01	0.62	0.96	10.11	806.11	0.66	1.01	4.12
10/11/03 21:45	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.01	4.12
10/11/03 21:50	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.01	4.11
10/11/03 21:55	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.01	4.11
10/11/03 22:00	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.00	4.11
10/11/03 22:05	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.00	4.10
10/11/03 22:10	3.01	799.01	0.62	0.95	10.11	806.11	0.65	1.00	4.10
10/11/03 22:15	3.01	799.01	0.61	0.95	10.11	806.11	0.64	1.00	4.10
10/11/03 22:20	3.01	799.01	0.61	0.95	10.11	806.11	0.64	0.99	4.10
10/11/03 22:25	3.01	799.01	0.61	0.94	10.11	806.11	0.64	0.99	4.09
10/11/03 22:30	3.01	799.01	0.61	0.94	10.11	806.11	0.64	0.99	4.09
10/11/03 22:35	3.01	799.01	0.61	0.94	10.11	806.11	0.64	0.99	4.09

10/11/03 22:40	3.01	799.01	0.60	0.93	10.11	806.11	0.64	0.99	4.08
10/11/03 22:45	3.01	799.01	0.60	0.93	10.11	806.11	0.64	0.98	4.08
10/11/03 22:50	3.01	799.01	0.60	0.93	10.11	806.11	0.63	0.98	4.08
10/11/03 22:55	3.01	799.01	0.60	0.93	10.11	806.11	0.63	0.98	4.07
10/11/03 23:00	3.01	799.01	0.60	0.92	10.11	806.11	0.63	0.98	4.07
10/11/03 23:05	3.01	799.01	0.60	0.92	10.11	806.11	0.63	0.97	4.07
10/11/03 23:10	3.01	799.01	0.60	0.92	10.11	806.11	0.63	0.97	4.07
10/11/03 23:15	3.01	799.01	0.59	0.92	10.11	806.11	0.63	0.97	4.06
10/11/03 23:20	3.01	799.01	0.59	0.92	10.11	806.11	0.62	0.97	4.06
10/11/03 23:25	3.01	799.01	0.59	0.92	10.11	806.11	0.62	0.96	4.06
10/11/03 23:30	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.96	4.05
10/11/03 23:35	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.96	4.05
10/11/03 23:40	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.96	4.05
10/11/03 23:45	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.96	4.05
10/11/03 23:50	3.01	799.01	0.59	0.91	10.11	806.11	0.62	0.95	4.04
10/11/03 23:55	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.95	4.04
10/12/03 00:00	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.95	4.04
10/12/03 00:05	3.01	799.01	0.58	0.90	10.11	806.11	0.61	0.95	4.03
10/12/03 00:10	3.01	799.01	0.58	0.90	10.11	806.11	0.61	0.95	4.03
10/12/03 00:15	3.01	799.01	0.58	0.90	10.11	806.11	0.61	0.94	4.03
10/12/03 00:20	3.01	799.01	0.58	0.90	10.11	806.11	0.61	0.94	4.03
10/12/03 00:25	3.01	799.01	0.58	0.90	10.11	806.11	0.61	0.94	4.02
10/12/03 00:30	3.01	799.01	0.58	0.90	10.11	806.11	0.61	0.94	4.02
10/12/03 00:35	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.94	4.02
10/12/03 00:40	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.02
10/12/03 00:45	3.01	799.01	0.58	0.89	10.11	806.11	0.60	0.93	4.02
10/12/03 00:50	3.01	799.01	0.58	0.89	10.11	806.11	0.60	0.93	4.01
10/12/03 00:55	3.01	799.01	0.58	0.89	10.11	806.11	0.60	0.93	4.01
10/12/03 01:00	3.01	799.01	0.58	0.89	10.11	806.11	0.60	0.93	4.01
10/12/03 01:05	3.01	799.01	0.57	0.89	10.11	806.11	0.60	0.93	4.01
10/12/03 01:10	3.01	799.01	0.57	0.89	10.11	806.11	0.60	0.92	4.00
10/12/03 01:15	3.01	799.01	0.57	0.89	10.11	806.11	0.60	0.92	4.00
10/12/03 01:20	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.92	4.00
10/12/03 01:25	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.92	4.00
10/12/03 01:30	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.92	4.00
10/12/03 01:35	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.92	3.99
10/12/03 01:40	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/12/03 01:45	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/12/03 01:50	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/12/03 01:55	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.99
10/12/03 02:00	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.98
10/12/03 02:05	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.98
10/12/03 02:10	3.01	799.01	0.57	0.87	10.11	806.11	0.59	0.91	3.98
10/12/03 02:15	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.98
10/12/03 02:20	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.98
10/12/03 02:25	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/12/03 02:30	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/12/03 02:35	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/12/03 02:40	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/12/03 02:45	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/12/03 02:50	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/12/03 02:55	3.01	799.01	0.56	0.86	10.11	806.11	0.58	0.89	3.96
10/12/03 03:00	3.01	799.01	0.56	0.86	10.11	806.11	0.58	0.89	3.96
10/12/03 03:05	3.01	799.01	0.56	0.86	10.11	806.11	0.58	0.89	3.96
10/12/03 03:10	3.01	799.01	0.56	0.86	10.11	806.11	0.57	0.89	3.96
10/12/03 03:15	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.89	3.96
10/12/03 03:20	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.89	3.95
10/12/03 03:25	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.89	3.95
10/12/03 03:30	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 03:35	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 03:40	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 03:45	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.95
10/12/03 03:50	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.94
10/12/03 03:55	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.94
10/12/03 04:00	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.94
10/12/03 04:05	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.94
10/12/03 04:10	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.87	3.94
10/12/03 04:15	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.94

10/12/03 04:20	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 04:25	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 04:30	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 04:35	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.87	3.93
10/12/03 04:40	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.87	3.93
10/12/03 04:45	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.87	3.93
10/12/03 04:50	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.87	3.93
10/12/03 04:55	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 05:00	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 05:05	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 05:10	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 05:15	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 05:20	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 05:25	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.92
10/12/03 05:30	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.86	3.91
10/12/03 05:35	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.86	3.91
10/12/03 05:40	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.86	3.91
10/12/03 05:45	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/12/03 05:50	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/12/03 05:55	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/12/03 06:00	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/12/03 06:05	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 06:10	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 06:15	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 06:20	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 06:25	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 06:30	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.85	3.90
10/12/03 06:35	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.84	3.90
10/12/03 06:40	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.84	3.89
10/12/03 06:45	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 06:50	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 06:55	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 07:00	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 07:05	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 07:10	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 07:15	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.88
10/12/03 07:20	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.88
10/12/03 07:25	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.88
10/12/03 07:30	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 07:35	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 07:40	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 07:45	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 07:50	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 07:55	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/12/03 08:00	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/12/03 08:05	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/12/03 08:10	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/12/03 08:15	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/12/03 08:20	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/12/03 08:25	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.82	3.87
10/12/03 08:30	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.82	3.87
10/12/03 08:35	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 08:40	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 08:45	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 08:50	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 08:55	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 09:00	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 09:05	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 09:10	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 09:15	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 09:20	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.85
10/12/03 09:25	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.85
10/12/03 09:30	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 09:35	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 09:40	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 09:45	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/12/03 09:50	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/12/03 09:55	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85

10/12/03 10:00	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:05	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:10	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:15	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:20	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:25	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:30	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 10:35	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.80	3.84
10/12/03 10:40	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.80	3.84
10/12/03 10:45	3.01	799.01	1.23	1.90	10.11	806.11	0.56	0.87	3.93
10/12/03 10:50	3.01	799.01	0.66	1.03	10.11	806.11	0.59	0.91	3.98
10/12/03 10:55	3.01	799.01	0.55	0.84	10.11	806.11	0.59	0.91	3.99
10/12/03 11:00	3.01	799.01	0.52	0.80	10.11	806.11	0.59	0.91	3.98
10/12/03 11:05	3.01	799.01	0.51	0.79	10.11	806.11	0.58	0.90	3.98
10/12/03 11:10	3.01	799.01	0.51	0.78	10.11	806.11	0.58	0.90	3.97
10/12/03 11:15	3.01	799.01	0.51	0.78	10.11	806.11	0.58	0.89	3.96
10/12/03 11:20	3.01	799.01	0.51	0.78	10.10	806.10	0.57	0.89	3.96
10/12/03 11:25	3.01	799.01	0.50	0.78	10.10	806.10	0.57	0.88	3.95
10/12/03 11:30	3.01	799.01	0.50	0.78	10.10	806.10	0.57	0.88	3.94
10/12/03 11:35	3.01	799.01	0.50	0.78	10.10	806.10	0.57	0.87	3.94
10/12/03 11:40	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.87	3.93
10/12/03 11:45	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.87	3.93
10/12/03 11:50	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.86	3.92
10/12/03 11:55	3.01	799.01	0.50	0.78	10.10	806.10	0.55	0.86	3.92
10/12/03 12:00	3.01	799.01	0.50	0.78	10.10	806.10	0.55	0.85	3.91
10/12/03 12:05	3.01	799.01	0.50	0.78	10.10	806.10	0.55	0.85	3.91
10/12/03 12:10	3.01	799.01	0.50	0.77	10.10	806.10	0.55	0.85	3.90
10/12/03 12:15	3.01	799.01	0.50	0.77	10.10	806.10	0.55	0.84	3.90
10/12/03 12:20	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.84	3.89
10/12/03 12:25	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.84	3.89
10/12/03 12:30	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.84	3.88
10/12/03 12:35	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.83	3.88
10/12/03 12:40	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.83	3.87
10/12/03 12:45	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.83	3.87
10/12/03 12:50	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.87
10/12/03 12:55	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.86
10/12/03 13:00	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.86
10/12/03 13:05	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.86
10/12/03 13:10	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.85
10/12/03 13:15	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.81	3.85
10/12/03 13:20	3.01	799.01	0.49	0.77	10.10	806.10	0.52	0.81	3.85
10/12/03 13:25	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.84
10/12/03 13:30	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.84
10/12/03 13:35	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.84
10/12/03 13:40	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.84
10/12/03 13:45	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.83
10/12/03 13:50	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.83
10/12/03 13:55	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.83
10/12/03 14:00	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.80	3.83
10/12/03 14:05	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.80	3.82
10/12/03 14:10	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.82
10/12/03 14:15	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.82
10/12/03 14:20	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/12/03 14:25	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/12/03 14:30	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/12/03 14:35	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/12/03 14:40	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.78	3.80
10/12/03 14:45	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.78	3.80
10/12/03 14:50	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.78	3.80
10/12/03 14:55	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.78	3.80
10/12/03 15:00	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.78	3.80
10/12/03 15:05	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.78	3.80
10/12/03 15:10	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.78	3.79
10/12/03 15:15	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.79
10/12/03 15:20	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.79
10/12/03 15:25	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.79
10/12/03 15:30	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.79
10/12/03 15:35	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.79

10/12/03 15:40	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/12/03 15:45	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/12/03 15:50	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/12/03 15:55	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.78
10/12/03 16:00	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.78
10/12/03 16:05	3.01	799.01	0.48	0.74	10.10	806.10	0.49	0.77	3.78
10/12/03 16:10	3.01	799.01	0.48	0.74	10.10	806.10	0.49	0.76	3.78
10/12/03 16:15	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:20	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:25	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:30	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:35	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:40	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:45	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/12/03 16:50	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.76
10/12/03 16:55	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.76
10/12/03 17:00	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.76
10/12/03 17:05	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.75	3.76
10/12/03 17:10	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/12/03 17:15	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/12/03 17:20	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/12/03 17:25	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/12/03 17:30	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/12/03 17:35	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.76
10/12/03 17:40	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.76
10/12/03 17:45	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/12/03 17:50	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/12/03 17:55	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/12/03 18:00	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/12/03 18:05	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/12/03 18:10	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.74	3.75
10/12/03 18:15	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.74	3.75
10/12/03 18:20	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.74	3.75
10/12/03 18:25	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/12/03 18:30	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 18:35	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 18:40	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 18:45	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 18:50	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 18:55	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 19:00	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 19:05	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 19:10	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/12/03 19:15	3.01	799.01	0.46	0.72	10.09	806.09	0.47	0.73	3.74
10/12/03 19:20	3.01	799.01	0.46	0.72	10.09	806.09	0.47	0.73	3.73
10/12/03 19:25	3.01	799.01	0.46	0.72	10.09	806.09	0.47	0.73	3.73
10/12/03 19:30	3.01	799.01	0.46	0.72	10.09	806.09	0.47	0.73	3.73
10/12/03 19:35	3.01	799.01	0.46	0.72	10.09	806.09	0.47	0.73	3.73
10/12/03 19:40	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 19:45	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 19:50	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 19:55	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 20:00	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 20:05	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/12/03 20:10	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/12/03 20:15	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/12/03 20:20	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/12/03 20:25	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.72	3.72
10/12/03 20:30	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.72	3.72
10/12/03 20:35	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.72	3.72
10/12/03 20:40	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.72	3.72
10/12/03 20:45	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.72	3.72
10/12/03 20:50	3.01	799.01	0.46	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 20:55	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/12/03 21:00	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.71
10/12/03 21:05	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 21:10	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 21:15	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71

10/12/03 21:20	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 21:25	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 21:30	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/12/03 21:35	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.71
10/12/03 21:40	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.71
10/12/03 21:45	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.71
10/12/03 21:50	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.70
10/12/03 21:55	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.70
10/12/03 22:00	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.70
10/12/03 22:05	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:10	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:15	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:20	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:25	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:30	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:35	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:40	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/12/03 22:45	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.69
10/12/03 22:50	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.70	3.69
10/12/03 22:55	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.70	3.69
10/12/03 23:00	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 23:05	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 23:10	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 23:15	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 23:20	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/12/03 23:25	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 23:30	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/12/03 23:35	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 23:40	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 23:45	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 23:50	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/12/03 23:55	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 00:00	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.68
10/13/03 00:05	3.01	799.01	0.45	0.69	10.09	806.09	0.45	0.70	3.68
10/13/03 00:10	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 00:15	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/13/03 00:20	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/13/03 00:25	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/13/03 00:30	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/13/03 00:35	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 00:40	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 00:45	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 00:50	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 00:55	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 01:00	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 01:05	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 01:10	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 01:15	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 01:20	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 01:25	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 01:30	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 01:35	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 01:40	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 01:45	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 01:50	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 01:55	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 02:00	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 02:05	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 02:10	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 02:15	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 02:20	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 02:25	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 02:30	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 02:35	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 02:40	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.67	3.65
10/13/03 02:45	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.67	3.65
10/13/03 02:50	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.67	3.65
10/13/03 02:55	3.01	799.01	0.42	0.66	10.09	806.09	0.43	0.67	3.65

10/13/03 03:00	3.01	799.01	0.42	0.66	10.09	806.09	0.43	0.67	3.65
10/13/03 03:05	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 03:10	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:15	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:20	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:25	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:30	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:35	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:40	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:45	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:50	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 03:55	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/13/03 04:00	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/13/03 04:05	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/13/03 04:10	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/13/03 04:15	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/13/03 04:20	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 04:25	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 04:30	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 04:35	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 04:40	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 04:45	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 04:50	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 04:55	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 05:00	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 05:05	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 05:10	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.62
10/13/03 05:15	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/13/03 05:20	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/13/03 05:25	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/13/03 05:30	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/13/03 05:35	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 05:40	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 05:45	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 05:50	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 05:55	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 06:00	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60
10/13/03 06:05	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60
10/13/03 06:10	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/13/03 06:15	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/13/03 06:20	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/13/03 06:25	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/13/03 06:30	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/13/03 06:35	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.64	3.60
10/13/03 06:40	3.01	799.01	0.40	0.63	10.08	806.08	0.42	0.64	3.59
10/13/03 06:45	3.01	799.01	0.40	0.63	10.08	806.08	0.41	0.64	3.59
10/13/03 06:50	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 06:55	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 07:00	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 07:05	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 07:10	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 07:15	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 07:20	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 07:25	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/13/03 07:30	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/13/03 07:35	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/13/03 07:40	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 07:45	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 07:50	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 07:55	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 08:00	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 08:05	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 08:10	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 08:15	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 08:20	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 08:25	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 08:30	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 08:35	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57

10/13/03 08:40	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.57
10/13/03 08:45	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.57
10/13/03 08:50	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.56
10/13/03 08:55	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 09:00	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 09:05	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 09:10	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 09:15	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 09:20	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 09:25	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 09:30	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 09:35	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 09:40	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 09:45	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 09:50	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 09:55	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 10:00	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 10:05	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 10:10	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.55
10/13/03 10:15	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/13/03 10:20	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.61	3.54
10/13/03 10:25	3.01	799.01	0.38	0.60	10.08	806.08	0.40	0.61	3.54
10/13/03 10:30	3.01	799.01	0.38	0.59	10.08	806.08	0.40	0.61	3.54
10/13/03 10:35	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 10:40	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 10:45	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 10:50	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 10:55	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 11:00	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 11:05	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 11:10	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 11:15	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 11:20	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/13/03 11:25	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/13/03 11:30	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/13/03 11:35	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/13/03 11:40	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.52
10/13/03 11:45	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 11:50	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 11:55	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 12:00	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 12:05	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 12:10	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 12:15	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.51
10/13/03 12:20	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.51
10/13/03 12:25	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.51
10/13/03 12:30	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.60	3.51
10/13/03 12:35	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/13/03 12:40	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/13/03 12:45	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/13/03 12:50	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/13/03 12:55	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/13/03 13:00	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:05	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:10	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:15	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:20	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:25	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:30	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:35	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 13:40	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 13:45	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 13:50	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 13:55	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 14:00	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 14:05	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 14:10	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 14:15	3.00	799.00	0.37	0.56	10.08	806.08	0.38	0.58	3.49

10/13/03 14:20	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.48
10/13/03 14:25	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.48
10/13/03 14:30	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 14:35	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 14:40	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 14:45	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 14:50	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 14:55	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 15:00	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.47
10/13/03 15:05	3.01	799.01	0.39	0.60	10.08	806.08	0.37	0.58	3.47
10/13/03 15:10	3.00	799.00	0.38	0.59	10.08	806.08	0.37	0.58	3.48
10/13/03 15:15	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/13/03 15:20	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 15:25	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.47
10/13/03 15:30	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.57	3.47
10/13/03 15:35	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 15:40	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 15:45	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 15:50	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 15:55	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 16:00	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:05	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:10	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:15	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:20	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:25	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:30	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 16:35	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.56	3.45
10/13/03 16:40	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 16:45	3.00	799.00	0.35	0.55	10.08	806.08	0.36	0.56	3.45
10/13/03 16:50	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 16:55	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 17:00	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 17:05	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 17:10	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 17:15	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 17:20	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 17:25	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 17:30	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 17:35	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 17:40	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.44
10/13/03 17:45	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.44
10/13/03 17:50	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 17:55	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 18:00	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.55	3.43
10/13/03 18:05	3.00	799.00	0.35	0.53	10.08	806.08	0.36	0.55	3.43
10/13/03 18:10	3.00	799.00	0.34	0.53	10.08	806.08	0.36	0.55	3.43
10/13/03 18:15	3.00	799.00	0.34	0.53	10.08	806.08	0.36	0.55	3.43
10/13/03 18:20	3.00	799.00	0.34	0.53	10.08	806.08	0.36	0.55	3.43
10/13/03 18:25	3.00	799.00	0.34	0.53	10.08	806.08	0.36	0.55	3.43
10/13/03 18:30	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 18:35	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 18:40	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 18:45	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 18:50	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 18:55	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.55	3.42
10/13/03 19:00	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/13/03 19:05	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.42
10/13/03 19:10	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 19:15	3.00	799.00	0.34	0.53	10.08	806.08	0.35	0.54	3.41
10/13/03 19:20	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 19:25	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 19:30	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 19:35	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 19:40	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 19:45	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.41
10/13/03 19:50	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/13/03 19:55	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40

10/13/03 20:00	3.00	799.00	0.34	0.52	10.08	806.08	0.35	0.54	3.40
10/13/03 20:05	3.00	799.00	0.33	0.52	10.07	806.07	0.35	0.54	3.40
10/13/03 20:10	3.00	799.00	0.33	0.52	10.07	806.07	0.35	0.54	3.40
10/13/03 20:15	3.00	799.00	0.33	0.52	10.07	806.07	0.35	0.53	3.40
10/13/03 20:20	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.40
10/13/03 20:25	3.00	799.00	0.33	0.52	10.07	806.07	0.34	0.53	3.39
10/13/03 20:30	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 20:35	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 20:40	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 20:45	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 20:50	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 20:55	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 21:00	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.39
10/13/03 21:05	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 21:10	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 21:15	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 21:20	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.53	3.38
10/13/03 21:25	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 21:30	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 21:35	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 21:40	3.00	799.00	0.33	0.51	10.07	806.07	0.34	0.52	3.38
10/13/03 21:45	3.00	799.00	0.33	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 21:50	3.00	799.00	0.33	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 21:55	3.00	799.00	0.33	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 22:00	3.00	799.00	0.32	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 22:05	3.00	799.00	0.32	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 22:10	3.00	799.00	0.32	0.50	10.07	806.07	0.34	0.52	3.37
10/13/03 22:15	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.37
10/13/03 22:20	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 22:25	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 22:30	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 22:35	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.52	3.36
10/13/03 22:40	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 22:45	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 22:50	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 22:55	3.00	799.00	0.32	0.50	10.07	806.07	0.33	0.51	3.36
10/13/03 23:00	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:05	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:10	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:15	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:20	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:25	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:30	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:35	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.35
10/13/03 23:40	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 23:45	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 23:50	3.00	799.00	0.32	0.49	10.07	806.07	0.33	0.51	3.34
10/13/03 23:55	3.00	799.00	0.31	0.49	10.07	806.07	0.33	0.50	3.34
10/14/03 00:00	3.00	799.00	0.31	0.49	10.07	806.07	0.33	0.50	3.34

	4MR Core Project Alterantive - 10-Year, 24-Hour Design Storm (711 and 733 Mon River Stage)								
	PHL Forebay		PHL Forebay Weir		Panther Hollow Lake		PHL Underflow Pipe		
Maximums	3.2	799.2	111.7	172.8	14.1	810.1	30.6	47.3	9.6
Date/Time	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Velocity (fps)
10/07/03 00:05	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:10	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:15	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:20	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:25	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:30	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:35	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:40	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:45	2.01	798.01	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:50	2.02	798.02	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:55	2.03	798.03	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:00	2.04	798.04	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:05	2.05	798.05	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:10	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:15	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:20	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:25	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:30	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:35	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:40	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:45	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:50	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:55	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:00	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:05	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:10	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:15	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:20	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:25	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:30	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:35	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:40	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:45	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:50	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:55	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:00	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:05	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:10	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:15	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:20	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:25	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:30	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:35	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:40	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:45	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:50	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:55	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:00	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:05	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:10	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:20	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:25	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:30	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:35	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:40	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:45	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:50	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:55	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:00	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:05	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:10	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 05:20	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:25	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:30	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:35	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:40	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:45	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:50	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:55	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:00	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:05	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:10	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:15	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:20	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:25	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:30	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:35	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:40	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:45	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:50	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:55	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:00	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:05	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:10	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:15	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:20	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:25	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:30	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:35	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:40	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:45	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:50	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:55	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:00	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:05	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:10	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:15	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:20	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:25	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:30	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:35	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:40	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:45	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:50	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:55	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:00	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:05	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:10	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:15	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:20	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:25	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:30	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:35	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:40	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:45	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:50	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:55	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:00	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:05	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:10	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:15	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:20	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:25	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:30	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:35	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:40	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:45	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:50	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:55	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 11:00	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:05	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:10	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:15	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:20	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:25	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:30	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:35	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:40	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:45	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:50	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:55	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:00	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:05	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:10	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:15	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:20	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:25	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:30	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:35	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:40	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:45	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:50	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:55	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:00	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:05	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:10	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:15	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:20	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:25	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:30	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:35	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:40	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:45	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:50	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:55	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:00	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:05	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:10	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:15	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:20	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:25	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:30	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:35	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:40	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:45	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:50	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:55	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:00	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:05	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:10	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:15	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:20	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:25	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:30	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:35	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:40	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:45	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:50	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:55	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:00	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:05	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:10	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:15	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:20	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:25	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:30	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:35	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 16:40	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:45	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:50	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:55	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:00	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:05	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:10	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:15	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:20	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:25	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:30	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:35	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:40	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:45	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:50	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:55	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:00	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:05	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:10	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:15	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:20	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:25	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:30	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:35	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:40	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:45	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:50	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:55	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:00	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:05	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:10	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:15	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:20	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:25	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:30	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:35	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:40	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:45	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:50	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:55	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:00	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:05	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:10	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:15	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:20	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:25	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:30	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:35	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:40	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:45	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:50	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:55	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:00	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:05	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:10	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:15	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:20	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:25	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:30	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:35	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:40	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:45	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:50	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:55	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:00	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:05	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:10	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:15	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 22:20	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:25	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:30	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:35	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:40	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:45	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:50	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:55	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:00	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:05	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:10	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:15	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:20	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:25	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:30	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:35	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:40	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:45	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:50	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:55	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:00	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:05	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:10	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:15	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:20	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:25	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:30	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:35	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:40	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:45	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:50	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:55	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:00	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:05	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:10	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:15	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:20	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:25	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:30	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:35	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:40	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:45	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:50	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:55	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:00	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:05	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:10	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:15	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:20	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:25	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:30	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:35	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:40	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:45	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:50	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:55	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:00	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:05	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:10	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:15	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:20	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:25	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:30	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:35	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:40	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:45	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:50	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:55	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 04:00	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:05	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:10	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:15	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:20	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:25	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:30	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:35	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:40	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:45	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:50	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:55	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:00	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:05	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:10	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:15	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:20	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:25	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:30	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:35	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:40	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:45	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:50	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:55	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:00	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:05	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:10	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:15	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:20	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:25	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:30	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:35	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:40	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:45	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:50	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:55	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:00	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:05	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:10	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:15	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:20	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:25	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:30	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:35	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:40	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:45	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:50	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:55	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:00	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:05	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:10	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:15	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:20	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:25	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:30	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:35	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:40	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:45	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:50	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:55	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:00	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:05	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:10	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:15	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:20	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:25	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:30	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:35	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 09:40	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:45	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:50	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:55	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:00	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:05	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:10	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:15	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:20	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:25	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:30	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:35	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:40	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:45	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:50	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:55	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:00	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:05	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:10	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:15	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:20	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:25	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:30	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:35	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:40	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:45	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:50	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:55	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:00	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:05	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:10	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:15	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:20	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:25	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:30	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:35	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:40	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:45	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:50	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:55	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:00	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:05	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:10	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:15	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:20	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:25	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:30	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:35	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:40	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:45	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:50	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:55	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:00	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:05	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:10	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:15	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:20	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:25	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:30	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:35	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:40	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:45	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:50	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:55	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:00	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:05	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:10	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:15	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 15:20	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:25	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:30	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:35	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:40	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:45	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:50	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:55	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:00	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:05	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:10	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:15	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:20	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:25	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:30	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:35	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:40	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:45	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:50	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:55	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:00	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:05	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:10	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:15	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:20	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:25	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:30	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:35	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:40	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:45	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:50	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:55	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:00	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:05	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:10	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:15	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:20	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:25	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:30	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:35	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:40	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:45	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:50	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:55	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:00	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:05	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:10	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:15	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:20	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:25	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:30	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:35	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:40	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:45	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:50	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:55	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:00	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:05	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:10	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:15	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:20	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:25	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:30	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:35	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:40	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:45	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:50	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:55	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 21:00	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:05	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:10	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:15	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:20	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:25	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:30	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:35	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:40	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:45	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:50	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:55	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:00	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:05	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:10	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:15	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:20	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:25	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:30	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:35	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:40	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:45	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:50	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:55	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:00	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:05	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:10	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:15	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:20	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:25	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:30	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:35	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:40	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/08/03 23:45	3.00	799.00	0.05	0.08	10.00	806.00	0.00	0.00	0.00
10/08/03 23:50	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/08/03 23:55	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/09/03 00:00	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:05	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:10	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:15	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:20	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:25	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	1.20
10/09/03 00:30	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.25
10/09/03 00:35	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.30
10/09/03 00:40	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.35
10/09/03 00:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.39
10/09/03 00:50	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.43
10/09/03 00:55	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.46
10/09/03 01:00	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.49
10/09/03 01:05	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.52
10/09/03 01:10	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.55
10/09/03 01:15	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.57
10/09/03 01:20	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.59
10/09/03 01:25	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.62
10/09/03 01:30	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.63
10/09/03 01:35	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.65
10/09/03 01:40	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.67
10/09/03 01:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.68
10/09/03 01:50	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.02	1.70
10/09/03 01:55	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.71
10/09/03 02:00	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.72
10/09/03 02:05	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.73
10/09/03 02:10	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.74
10/09/03 02:15	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.75
10/09/03 02:20	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.76
10/09/03 02:25	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:30	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:35	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.78

10/09/03 02:40	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.79
10/09/03 02:45	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.79
10/09/03 02:50	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 02:55	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 03:00	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:05	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:10	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.81
10/09/03 03:15	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.80
10/09/03 03:20	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:25	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:30	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:35	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:40	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:45	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.05	1.80
10/09/03 03:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:05	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:10	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:15	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:20	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:25	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:30	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:35	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.81
10/09/03 04:40	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:45	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.83
10/09/03 04:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.84
10/09/03 05:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.85
10/09/03 05:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.85
10/09/03 05:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.86
10/09/03 05:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.87
10/09/03 05:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.89
10/09/03 05:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:40	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:45	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:50	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:55	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.92
10/09/03 06:00	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 06:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 07:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.03
10/09/03 08:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04

10/09/03 08:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:15	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:20	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:25	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:30	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:35	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:40	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:45	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.08
10/09/03 09:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.10
10/09/03 10:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14

10/09/03 14:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.15
10/09/03 17:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16

10/09/03 19:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 21:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16

10/10/03 01:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:40	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 01:45	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.17
10/10/03 01:50	3.00	799.00	0.10	0.15	10.03	806.03	0.08	0.12	2.18
10/10/03 01:55	3.00	799.00	0.10	0.16	10.03	806.03	0.08	0.12	2.18
10/10/03 02:00	3.00	799.00	0.11	0.17	10.03	806.03	0.08	0.12	2.19
10/10/03 02:05	3.00	799.00	0.12	0.19	10.03	806.03	0.08	0.12	2.20
10/10/03 02:10	3.00	799.00	0.13	0.20	10.03	806.03	0.08	0.13	2.22
10/10/03 02:15	3.00	799.00	0.13	0.21	10.03	806.03	0.08	0.13	2.23
10/10/03 02:20	3.00	799.00	0.14	0.22	10.03	806.03	0.09	0.13	2.25
10/10/03 02:25	3.00	799.00	0.15	0.23	10.03	806.03	0.09	0.13	2.26
10/10/03 02:30	3.00	799.00	0.15	0.23	10.03	806.03	0.09	0.14	2.28
10/10/03 02:35	3.00	799.00	0.16	0.24	10.03	806.03	0.09	0.14	2.30
10/10/03 02:40	3.00	799.00	0.16	0.25	10.03	806.03	0.09	0.15	2.31
10/10/03 02:45	3.00	799.00	0.17	0.26	10.03	806.03	0.10	0.15	2.33
10/10/03 02:50	3.00	799.00	0.17	0.27	10.03	806.03	0.10	0.15	2.35
10/10/03 02:55	3.00	799.00	0.18	0.27	10.03	806.03	0.10	0.16	2.37
10/10/03 03:00	3.00	799.00	0.18	0.28	10.03	806.03	0.10	0.16	2.38
10/10/03 03:05	3.00	799.00	0.19	0.29	10.03	806.03	0.11	0.16	2.40
10/10/03 03:10	3.00	799.00	0.19	0.29	10.04	806.04	0.11	0.17	2.42
10/10/03 03:15	3.00	799.00	0.20	0.30	10.04	806.04	0.11	0.17	2.43
10/10/03 03:20	3.00	799.00	0.20	0.31	10.04	806.04	0.12	0.18	2.45
10/10/03 03:25	3.00	799.00	0.21	0.32	10.04	806.04	0.12	0.18	2.47
10/10/03 03:30	3.00	799.00	0.21	0.33	10.04	806.04	0.12	0.19	2.48
10/10/03 03:35	3.00	799.00	0.22	0.34	10.04	806.04	0.12	0.19	2.50
10/10/03 03:40	3.00	799.00	0.22	0.34	10.04	806.04	0.13	0.20	2.52
10/10/03 03:45	3.00	799.00	0.23	0.35	10.04	806.04	0.13	0.20	2.54
10/10/03 03:50	3.00	799.00	0.23	0.36	10.04	806.04	0.13	0.21	2.56
10/10/03 03:55	3.00	799.00	0.24	0.37	10.04	806.04	0.14	0.21	2.58
10/10/03 04:00	3.00	799.00	0.24	0.38	10.04	806.04	0.14	0.22	2.60
10/10/03 04:05	3.00	799.00	0.25	0.39	10.04	806.04	0.15	0.23	2.62
10/10/03 04:10	3.00	799.00	0.26	0.40	10.04	806.04	0.15	0.23	2.64
10/10/03 04:15	3.00	799.00	0.27	0.41	10.04	806.04	0.15	0.24	2.66
10/10/03 04:20	3.00	799.00	0.27	0.42	10.04	806.04	0.16	0.24	2.68
10/10/03 04:25	3.00	799.00	0.28	0.43	10.05	806.05	0.16	0.25	2.71
10/10/03 04:30	3.00	799.00	0.29	0.44	10.05	806.05	0.17	0.26	2.73
10/10/03 04:35	3.00	799.00	0.29	0.45	10.05	806.05	0.17	0.27	2.75
10/10/03 04:40	3.00	799.00	0.30	0.46	10.05	806.05	0.18	0.27	2.78
10/10/03 04:45	3.00	799.00	0.30	0.47	10.05	806.05	0.18	0.28	2.80
10/10/03 04:50	3.00	799.00	0.31	0.48	10.05	806.05	0.19	0.29	2.82
10/10/03 04:55	3.00	799.00	0.31	0.48	10.05	806.05	0.19	0.30	2.85
10/10/03 05:00	3.00	799.00	0.32	0.49	10.05	806.05	0.20	0.30	2.87
10/10/03 05:05	3.00	799.00	0.32	0.50	10.05	806.05	0.20	0.31	2.89
10/10/03 05:10	3.00	799.00	0.33	0.51	10.05	806.05	0.21	0.32	2.91
10/10/03 05:15	3.00	799.00	0.33	0.52	10.05	806.05	0.21	0.33	2.94
10/10/03 05:20	3.00	799.00	0.34	0.53	10.06	806.06	0.22	0.33	2.96
10/10/03 05:25	3.00	799.00	0.35	0.54	10.06	806.06	0.22	0.34	2.98
10/10/03 05:30	3.00	799.00	0.35	0.55	10.06	806.06	0.23	0.35	3.01
10/10/03 05:35	3.00	799.00	0.36	0.56	10.06	806.06	0.23	0.36	3.03
10/10/03 05:40	3.00	799.00	0.37	0.57	10.06	806.06	0.24	0.37	3.06
10/10/03 05:45	3.00	799.00	0.37	0.58	10.06	806.06	0.24	0.38	3.07
10/10/03 05:50	3.00	799.00	0.38	0.59	10.06	806.06	0.25	0.38	3.09
10/10/03 05:55	3.01	799.01	0.39	0.60	10.06	806.06	0.25	0.39	3.11
10/10/03 06:00	3.01	799.01	0.39	0.60	10.06	806.06	0.26	0.40	3.13
10/10/03 06:05	3.01	799.01	0.40	0.62	10.06	806.06	0.27	0.41	3.15
10/10/03 06:10	3.01	799.01	0.41	0.63	10.06	806.06	0.27	0.42	3.17
10/10/03 06:15	3.01	799.01	0.41	0.64	10.07	806.07	0.28	0.43	3.19
10/10/03 06:20	3.01	799.01	0.42	0.65	10.07	806.07	0.28	0.44	3.21
10/10/03 06:25	3.01	799.01	0.42	0.66	10.07	806.07	0.29	0.45	3.23
10/10/03 06:30	3.01	799.01	0.43	0.67	10.07	806.07	0.30	0.46	3.25
10/10/03 06:35	3.01	799.01	0.44	0.67	10.07	806.07	0.30	0.47	3.27
10/10/03 06:40	3.01	799.01	0.44	0.68	10.07	806.07	0.31	0.48	3.29
10/10/03 06:45	3.01	799.01	0.44	0.69	10.07	806.07	0.32	0.49	3.31
10/10/03 06:50	3.01	799.01	0.45	0.69	10.07	806.07	0.32	0.50	3.33
10/10/03 06:55	3.01	799.01	0.45	0.70	10.07	806.07	0.33	0.51	3.35

10/10/03 07:00	3.01	799.01	0.46	0.71	10.07	806.07	0.33	0.52	3.36
10/10/03 07:05	3.01	799.01	0.46	0.72	10.07	806.07	0.34	0.53	3.38
10/10/03 07:10	3.01	799.01	0.47	0.73	10.08	806.08	0.35	0.54	3.40
10/10/03 07:15	3.01	799.01	0.48	0.75	10.08	806.08	0.35	0.55	3.42
10/10/03 07:20	3.01	799.01	0.49	0.76	10.08	806.08	0.36	0.56	3.44
10/10/03 07:25	3.01	799.01	0.50	0.77	10.08	806.08	0.37	0.57	3.46
10/10/03 07:30	3.01	799.01	0.51	0.79	10.08	806.08	0.37	0.58	3.48
10/10/03 07:35	3.01	799.01	0.52	0.80	10.08	806.08	0.38	0.59	3.50
10/10/03 07:40	3.01	799.01	0.53	0.82	10.08	806.08	0.39	0.60	3.52
10/10/03 07:45	3.01	799.01	0.54	0.84	10.08	806.08	0.40	0.61	3.54
10/10/03 07:50	3.01	799.01	0.55	0.86	10.08	806.08	0.40	0.63	3.56
10/10/03 07:55	3.01	799.01	0.57	0.87	10.08	806.08	0.41	0.64	3.59
10/10/03 08:00	3.01	799.01	0.58	0.89	10.09	806.09	0.42	0.65	3.61
10/10/03 08:05	3.01	799.01	0.60	0.92	10.09	806.09	0.43	0.66	3.63
10/10/03 08:10	3.01	799.01	0.60	0.92	10.09	806.09	0.44	0.68	3.66
10/10/03 08:15	3.01	799.01	0.60	0.94	10.09	806.09	0.45	0.69	3.67
10/10/03 08:20	3.01	799.01	0.64	0.99	10.09	806.09	0.46	0.71	3.70
10/10/03 08:25	3.01	799.01	0.66	1.03	10.09	806.09	0.47	0.72	3.72
10/10/03 08:30	3.01	799.01	0.68	1.06	10.09	806.09	0.48	0.74	3.74
10/10/03 08:35	3.01	799.01	0.70	1.09	10.09	806.09	0.49	0.76	3.76
10/10/03 08:40	3.01	799.01	0.72	1.12	10.10	806.10	0.50	0.78	3.79
10/10/03 08:45	3.01	799.01	0.74	1.14	10.10	806.10	0.51	0.79	3.82
10/10/03 08:50	3.01	799.01	0.76	1.17	10.10	806.10	0.53	0.81	3.85
10/10/03 08:55	3.01	799.01	0.78	1.20	10.10	806.10	0.54	0.83	3.88
10/10/03 09:00	3.01	799.01	0.79	1.23	10.10	806.10	0.55	0.85	3.91
10/10/03 09:05	3.01	799.01	0.81	1.26	10.10	806.10	0.57	0.88	3.94
10/10/03 09:10	3.01	799.01	0.83	1.29	10.11	806.11	0.58	0.90	3.97
10/10/03 09:15	3.01	799.01	0.85	1.32	10.11	806.11	0.60	0.92	4.00
10/10/03 09:20	3.01	799.01	0.87	1.35	10.11	806.11	0.61	0.94	4.03
10/10/03 09:25	3.01	799.01	0.89	1.37	10.11	806.11	0.63	0.97	4.06
10/10/03 09:30	3.01	799.01	0.90	1.40	10.11	806.11	0.64	0.99	4.09
10/10/03 09:35	3.01	799.01	0.92	1.43	10.12	806.12	0.66	1.02	4.12
10/10/03 09:40	3.01	799.01	0.94	1.46	10.12	806.12	0.67	1.04	4.15
10/10/03 09:45	3.01	799.01	0.96	1.49	10.12	806.12	0.69	1.07	4.18
10/10/03 09:50	3.01	799.01	0.98	1.52	10.12	806.12	0.71	1.09	4.21
10/10/03 09:55	3.01	799.01	1.00	1.55	10.12	806.12	0.72	1.12	4.24
10/10/03 10:00	3.01	799.01	1.01	1.57	10.13	806.13	0.74	1.15	4.26
10/10/03 10:05	3.01	799.01	1.04	1.62	10.13	806.13	0.76	1.18	4.29
10/10/03 10:10	3.01	799.01	1.07	1.66	10.13	806.13	0.78	1.21	4.32
10/10/03 10:15	3.01	799.01	1.10	1.70	10.13	806.13	0.80	1.24	4.34
10/10/03 10:20	3.01	799.01	1.12	1.74	10.13	806.13	0.82	1.27	4.37
10/10/03 10:25	3.01	799.01	1.15	1.77	10.14	806.14	0.84	1.30	4.40
10/10/03 10:30	3.01	799.01	1.17	1.82	10.14	806.14	0.86	1.33	4.43
10/10/03 10:35	3.01	799.01	1.23	1.90	10.14	806.14	0.88	1.37	4.46
10/10/03 10:40	3.01	799.01	1.25	1.93	10.14	806.14	0.91	1.41	4.50
10/10/03 10:45	3.01	799.01	1.30	2.02	10.15	806.15	0.93	1.45	4.54
10/10/03 10:50	3.01	799.01	1.37	2.11	10.15	806.15	0.96	1.49	4.58
10/10/03 10:55	3.01	799.01	1.42	2.20	10.15	806.15	0.99	1.53	4.62
10/10/03 11:00	3.01	799.01	1.47	2.27	10.16	806.16	1.02	1.58	4.66
10/10/03 11:05	3.01	799.01	1.58	2.44	10.16	806.16	1.06	1.64	4.71
10/10/03 11:10	3.01	799.01	1.66	2.57	10.16	806.16	1.10	1.70	4.75
10/10/03 11:15	3.01	799.01	1.76	2.72	10.17	806.17	1.14	1.77	4.81
10/10/03 11:20	3.01	799.01	1.85	2.86	10.17	806.17	1.19	1.84	4.86
10/10/03 11:25	3.01	799.01	1.94	3.00	10.18	806.18	1.24	1.92	4.91
10/10/03 11:30	3.02	799.02	2.03	3.14	10.18	806.18	1.30	2.01	4.97
10/10/03 11:35	3.02	799.02	2.57	3.98	10.19	806.19	1.37	2.13	5.06
10/10/03 11:40	3.02	799.02	3.22	4.98	10.20	806.20	1.49	2.31	5.17
10/10/03 11:45	3.02	799.02	3.94	6.09	10.22	806.22	1.65	2.56	5.32
10/10/03 11:50	3.04	799.04	10.24	15.84	10.26	806.26	2.03	3.14	5.61
10/10/03 11:55	3.07	799.07	21.91	33.90	10.35	806.35	3.19	4.93	6.29
10/10/03 12:00	3.11	799.11	37.24	57.62	10.53	806.53	5.77	8.93	7.28
10/10/03 12:05	3.18	799.18	79.18	122.50	10.79	806.79	10.57	16.36	8.32
10/10/03 12:10	3.20	799.20	93.26	144.29	11.19	807.19	17.57	27.18	9.27
10/10/03 12:15	3.22	799.22	107.97	167.05	11.62	807.62	20.62	31.90	9.52
10/10/03 12:20	3.22	799.22	111.68	172.78	12.06	808.06	23.42	36.23	8.95
10/10/03 12:25	3.21	799.21	101.80	157.50	12.45	808.45	25.60	39.61	8.36
10/10/03 12:30	3.20	799.20	95.16	147.24	12.77	808.77	27.37	42.34	8.63
10/10/03 12:35	3.19	799.19	87.54	135.44	13.04	809.04	28.72	44.43	9.05

10/10/03 12:40	3.18	799.18	80.76	124.96	13.27	809.27	29.78	46.07	9.39
10/10/03 12:45	3.17	799.17	73.20	113.25	13.46	809.46	29.96	46.36	9.44
10/10/03 12:50	3.15	799.15	65.41	101.20	13.62	809.62	30.12	46.59	9.49
10/10/03 12:55	3.14	799.14	58.31	90.21	13.75	809.75	30.24	46.78	9.53
10/10/03 13:00	3.13	799.13	52.74	81.60	13.85	809.85	30.33	46.93	9.56
10/10/03 13:05	3.13	799.13	48.43	74.93	13.93	809.93	30.41	47.05	9.59
10/10/03 13:10	3.12	799.12	42.89	66.35	14.00	810.00	30.47	47.15	9.60
10/10/03 13:15	3.11	799.11	40.51	62.68	14.04	810.04	30.52	47.22	9.62
10/10/03 13:20	3.11	799.11	36.63	56.67	14.08	810.08	30.55	47.27	9.63
10/10/03 13:25	3.10	799.10	34.22	52.95	14.10	810.10	30.57	47.30	9.64
10/10/03 13:30	3.10	799.10	31.79	49.18	14.12	810.12	30.59	47.33	9.64
10/10/03 13:35	3.09	799.09	29.58	45.76	14.12	810.12	30.59	47.34	9.64
10/10/03 13:40	3.09	799.09	27.74	42.92	14.12	810.12	30.59	47.34	9.64
10/10/03 13:45	3.08	799.08	26.13	40.43	14.12	810.12	30.59	47.32	9.64
10/10/03 13:50	3.08	799.08	24.75	38.30	14.10	810.10	30.58	47.31	9.64
10/10/03 13:55	3.08	799.08	23.58	36.48	14.08	810.08	30.56	47.28	9.63
10/10/03 14:00	3.08	799.08	22.63	35.01	14.06	810.06	30.54	47.25	9.63
10/10/03 14:05	3.07	799.07	21.54	33.32	14.04	810.04	30.51	47.21	9.62
10/10/03 14:10	3.07	799.07	20.53	31.76	14.01	810.01	30.49	47.17	9.61
10/10/03 14:15	3.07	799.07	19.61	30.34	13.97	809.97	30.46	47.12	9.60
10/10/03 14:20	3.07	799.07	18.79	29.08	13.94	809.94	30.42	47.07	9.59
10/10/03 14:25	3.07	799.07	18.00	27.86	13.90	809.90	30.38	47.01	9.58
10/10/03 14:30	3.06	799.06	17.19	26.60	13.86	809.86	30.34	46.95	9.56
10/10/03 14:35	3.06	799.06	16.55	25.61	13.81	809.81	30.30	46.88	9.55
10/10/03 14:40	3.06	799.06	15.99	24.74	13.76	809.76	30.26	46.81	9.54
10/10/03 14:45	3.06	799.06	15.32	23.70	13.71	809.71	30.21	46.74	9.52
10/10/03 14:50	3.06	799.06	14.17	21.92	13.66	809.66	30.16	46.66	9.51
10/10/03 14:55	3.05	799.05	13.43	20.78	13.60	809.60	30.10	46.58	9.49
10/10/03 15:00	3.05	799.05	12.66	19.59	13.54	809.54	30.05	46.49	9.47
10/10/03 15:05	3.05	799.05	11.95	18.48	13.47	809.47	29.98	46.39	9.45
10/10/03 15:10	3.05	799.05	11.50	17.79	13.41	809.41	29.92	46.29	9.43
10/10/03 15:15	3.05	799.05	11.14	17.23	13.34	809.34	29.86	46.19	9.41
10/10/03 15:20	3.05	799.05	10.77	16.66	13.27	809.27	29.79	46.09	9.39
10/10/03 15:25	3.05	799.05	10.42	16.12	13.20	809.20	29.64	45.85	9.34
10/10/03 15:30	3.04	799.04	10.12	15.66	13.13	809.13	29.30	45.33	9.24
10/10/03 15:35	3.04	799.04	9.84	15.23	13.05	809.05	28.96	44.80	9.13
10/10/03 15:40	3.04	799.04	9.62	14.88	12.98	808.98	28.61	44.27	9.02
10/10/03 15:45	3.04	799.04	9.41	14.56	12.91	808.91	28.26	43.72	8.91
10/10/03 15:50	3.04	799.04	9.22	14.26	12.83	808.83	27.90	43.17	8.79
10/10/03 15:55	3.04	799.04	9.02	13.95	12.76	808.76	27.54	42.61	8.68
10/10/03 16:00	3.04	799.04	8.83	13.67	12.69	808.69	27.17	42.03	8.56
10/10/03 16:05	3.04	799.04	8.60	13.31	12.61	808.61	26.79	41.46	8.45
10/10/03 16:10	3.04	799.04	8.35	12.92	12.54	808.54	26.42	40.87	8.33
10/10/03 16:15	3.04	799.04	8.09	12.51	12.46	808.46	26.05	40.30	8.21
10/10/03 16:20	3.04	799.04	7.83	12.12	12.39	808.39	25.86	40.01	8.17
10/10/03 16:25	3.04	799.04	7.59	11.74	12.31	808.31	25.22	39.03	8.34
10/10/03 16:30	3.04	799.04	7.36	11.39	12.23	808.23	24.80	38.37	8.41
10/10/03 16:35	3.04	799.04	7.13	11.04	12.16	808.16	24.37	37.71	8.48
10/10/03 16:40	3.03	799.03	6.93	10.71	12.08	808.08	23.94	37.04	8.57
10/10/03 16:45	3.03	799.03	6.73	10.41	12.00	808.00	23.50	36.36	8.77
10/10/03 16:50	3.03	799.03	6.52	10.09	11.93	807.93	23.04	35.65	8.96
10/10/03 16:55	3.03	799.03	6.32	9.78	11.85	807.85	22.58	34.94	9.07
10/10/03 17:00	3.03	799.03	6.15	9.52	11.78	807.78	22.12	34.22	9.17
10/10/03 17:05	3.03	799.03	5.95	9.20	11.70	807.70	21.65	33.49	9.26
10/10/03 17:10	3.03	799.03	5.78	8.94	11.63	807.63	21.18	32.76	9.36
10/10/03 17:15	3.03	799.03	5.62	8.69	11.56	807.56	20.70	32.03	9.45
10/10/03 17:20	3.03	799.03	5.47	8.47	11.49	807.49	20.24	31.32	9.53
10/10/03 17:25	3.03	799.03	5.36	8.29	11.42	807.42	19.77	30.58	9.49
10/10/03 17:30	3.03	799.03	5.26	8.14	11.35	807.35	19.28	29.83	9.45
10/10/03 17:35	3.03	799.03	5.15	7.97	11.28	807.28	18.80	29.08	9.41
10/10/03 17:40	3.03	799.03	5.04	7.80	11.21	807.21	18.31	28.33	9.37
10/10/03 17:45	3.03	799.03	4.93	7.62	11.15	807.15	17.82	27.57	9.32
10/10/03 17:50	3.03	799.03	4.81	7.44	11.09	807.09	17.33	26.81	9.28
10/10/03 17:55	3.03	799.03	4.69	7.25	11.03	807.03	16.83	26.05	9.23
10/10/03 18:00	3.03	799.03	4.57	7.08	10.97	806.97	16.23	25.11	9.18
10/10/03 18:05	3.03	799.03	4.47	6.92	10.91	806.91	14.86	23.00	9.02
10/10/03 18:10	3.03	799.03	4.38	6.77	10.86	806.86	13.67	21.16	8.88
10/10/03 18:15	3.03	799.03	4.29	6.64	10.82	806.82	12.64	19.55	8.74

10/10/03 18:20	3.02	799.02	4.21	6.52	10.78	806.78	11.72	18.14	8.60
10/10/03 18:25	3.02	799.02	4.14	6.40	10.74	806.74	10.92	16.90	8.47
10/10/03 18:30	3.02	799.02	4.07	6.30	10.71	806.71	10.21	15.80	8.35
10/10/03 18:35	3.02	799.02	4.01	6.20	10.68	806.68	9.58	14.82	8.24
10/10/03 18:40	3.02	799.02	3.95	6.12	10.65	806.65	9.02	13.95	8.13
10/10/03 18:45	3.02	799.02	3.90	6.03	10.63	806.63	8.52	13.18	8.03
10/10/03 18:50	3.02	799.02	3.85	5.96	10.61	806.61	8.07	12.49	7.93
10/10/03 18:55	3.02	799.02	3.80	5.88	10.59	806.59	7.67	11.86	7.84
10/10/03 19:00	3.02	799.02	3.76	5.81	10.57	806.57	7.31	11.30	7.75
10/10/03 19:05	3.02	799.02	3.71	5.74	10.55	806.55	6.98	10.80	7.67
10/10/03 19:10	3.02	799.02	3.68	5.69	10.54	806.54	6.68	10.34	7.59
10/10/03 19:15	3.02	799.02	3.65	5.64	10.52	806.52	6.42	9.93	7.52
10/10/03 19:20	3.02	799.02	3.62	5.60	10.51	806.51	6.17	9.55	7.45
10/10/03 19:25	3.02	799.02	3.59	5.56	10.50	806.50	5.95	9.21	7.39
10/10/03 19:30	3.02	799.02	3.56	5.51	10.49	806.49	5.75	8.90	7.33
10/10/03 19:35	3.02	799.02	3.53	5.47	10.48	806.48	5.57	8.61	7.27
10/10/03 19:40	3.02	799.02	3.50	5.41	10.47	806.47	5.40	8.35	7.22
10/10/03 19:45	3.02	799.02	3.45	5.34	10.46	806.46	5.24	8.11	7.17
10/10/03 19:50	3.02	799.02	3.40	5.27	10.45	806.45	5.10	7.89	7.12
10/10/03 19:55	3.02	799.02	3.36	5.21	10.44	806.44	4.96	7.68	7.07
10/10/03 20:00	3.02	799.02	3.33	5.15	10.43	806.43	4.84	7.48	7.03
10/10/03 20:05	3.02	799.02	3.28	5.07	10.43	806.43	4.72	7.30	6.98
10/10/03 20:10	3.02	799.02	3.22	4.99	10.42	806.42	4.60	7.12	6.94
10/10/03 20:15	3.02	799.02	3.17	4.90	10.41	806.41	4.50	6.96	6.90
10/10/03 20:20	3.02	799.02	3.12	4.82	10.41	806.41	4.39	6.80	6.86
10/10/03 20:25	3.02	799.02	3.06	4.74	10.40	806.40	4.29	6.65	6.83
10/10/03 20:30	3.02	799.02	3.02	4.67	10.39	806.39	4.20	6.50	6.79
10/10/03 20:35	3.02	799.02	2.95	4.57	10.39	806.39	4.11	6.36	6.75
10/10/03 20:40	3.02	799.02	2.90	4.48	10.38	806.38	4.02	6.22	6.72
10/10/03 20:45	3.02	799.02	2.85	4.40	10.38	806.38	3.94	6.09	6.68
10/10/03 20:50	3.02	799.02	2.79	4.32	10.37	806.37	3.86	5.96	6.65
10/10/03 20:55	3.02	799.02	2.74	4.24	10.37	806.37	3.78	5.84	6.61
10/10/03 21:00	3.02	799.02	2.69	4.16	10.36	806.36	3.70	5.72	6.58
10/10/03 21:05	3.02	799.02	2.64	4.08	10.36	806.36	3.62	5.61	6.54
10/10/03 21:10	3.02	799.02	2.59	4.00	10.35	806.35	3.55	5.49	6.51
10/10/03 21:15	3.02	799.02	2.54	3.93	10.35	806.35	3.48	5.38	6.47
10/10/03 21:20	3.02	799.02	2.49	3.85	10.34	806.34	3.41	5.28	6.44
10/10/03 21:25	3.02	799.02	2.44	3.78	10.34	806.34	3.34	5.17	6.41
10/10/03 21:30	3.02	799.02	2.40	3.71	10.33	806.33	3.28	5.07	6.38
10/10/03 21:35	3.02	799.02	2.36	3.65	10.33	806.33	3.22	4.98	6.35
10/10/03 21:40	3.02	799.02	2.32	3.59	10.33	806.33	3.15	4.88	6.31
10/10/03 21:45	3.02	799.02	2.28	3.53	10.32	806.32	3.10	4.79	6.28
10/10/03 21:50	3.02	799.02	2.24	3.47	10.32	806.32	3.04	4.70	6.25
10/10/03 21:55	3.02	799.02	2.21	3.41	10.31	806.31	2.98	4.61	6.22
10/10/03 22:00	3.02	799.02	2.17	3.36	10.31	806.31	2.93	4.53	6.19
10/10/03 22:05	3.02	799.02	2.14	3.31	10.31	806.31	2.87	4.45	6.16
10/10/03 22:10	3.02	799.02	2.10	3.26	10.30	806.30	2.82	4.37	6.14
10/10/03 22:15	3.02	799.02	2.07	3.21	10.30	806.30	2.77	4.29	6.11
10/10/03 22:20	3.02	799.02	2.04	3.16	10.30	806.30	2.73	4.22	6.08
10/10/03 22:25	3.02	799.02	2.02	3.12	10.29	806.29	2.68	4.15	6.06
10/10/03 22:30	3.02	799.02	2.00	3.09	10.29	806.29	2.63	4.08	6.03
10/10/03 22:35	3.01	799.01	1.97	3.05	10.29	806.29	2.59	4.01	6.00
10/10/03 22:40	3.01	799.01	1.94	3.01	10.28	806.28	2.55	3.94	5.98
10/10/03 22:45	3.01	799.01	1.91	2.96	10.28	806.28	2.51	3.88	5.95
10/10/03 22:50	3.01	799.01	1.89	2.92	10.28	806.28	2.47	3.82	5.92
10/10/03 22:55	3.01	799.01	1.86	2.88	10.27	806.27	2.43	3.76	5.90
10/10/03 23:00	3.01	799.01	1.84	2.84	10.27	806.27	2.39	3.70	5.87
10/10/03 23:05	3.01	799.01	1.81	2.81	10.27	806.27	2.36	3.65	5.85
10/10/03 23:10	3.01	799.01	1.80	2.78	10.27	806.27	2.32	3.59	5.83
10/10/03 23:15	3.01	799.01	1.78	2.75	10.26	806.26	2.29	3.54	5.81
10/10/03 23:20	3.01	799.01	1.76	2.73	10.26	806.26	2.25	3.49	5.79
10/10/03 23:25	3.01	799.01	1.75	2.70	10.26	806.26	2.22	3.44	5.76
10/10/03 23:30	3.01	799.01	1.73	2.68	10.26	806.26	2.19	3.39	5.74
10/10/03 23:35	3.01	799.01	1.71	2.65	10.25	806.25	2.16	3.35	5.72
10/10/03 23:40	3.01	799.01	1.70	2.63	10.25	806.25	2.13	3.30	5.70
10/10/03 23:45	3.01	799.01	1.69	2.61	10.25	806.25	2.11	3.26	5.68
10/10/03 23:50	3.01	799.01	1.67	2.59	10.25	806.25	2.08	3.22	5.66
10/10/03 23:55	3.01	799.01	1.66	2.57	10.25	806.25	2.05	3.18	5.64

10/11/03 00:00	3.01	799.01	1.65	2.55	10.24	806.24	2.03	3.14	5.62
10/11/03 00:05	3.01	799.01	1.61	2.49	10.24	806.24	2.01	3.10	5.61
10/11/03 00:10	3.01	799.01	1.57	2.44	10.24	806.24	1.98	3.06	5.59
10/11/03 00:15	3.01	799.01	1.54	2.39	10.24	806.24	1.95	3.02	5.56
10/11/03 00:20	3.01	799.01	1.51	2.34	10.23	806.23	1.92	2.98	5.54
10/11/03 00:25	3.01	799.01	1.48	2.29	10.23	806.23	1.90	2.93	5.52
10/11/03 00:30	3.01	799.01	1.46	2.25	10.23	806.23	1.87	2.89	5.50
10/11/03 00:35	3.01	799.01	1.43	2.21	10.23	806.23	1.84	2.85	5.48
10/11/03 00:40	3.01	799.01	1.41	2.18	10.23	806.23	1.81	2.81	5.45
10/11/03 00:45	3.01	799.01	1.39	2.15	10.22	806.22	1.79	2.77	5.43
10/11/03 00:50	3.01	799.01	1.37	2.13	10.22	806.22	1.76	2.73	5.41
10/11/03 00:55	3.01	799.01	1.36	2.10	10.22	806.22	1.74	2.69	5.39
10/11/03 01:00	3.01	799.01	1.34	2.08	10.22	806.22	1.71	2.65	5.37
10/11/03 01:05	3.01	799.01	1.33	2.05	10.22	806.22	1.69	2.61	5.35
10/11/03 01:10	3.01	799.01	1.31	2.03	10.21	806.21	1.67	2.58	5.33
10/11/03 01:15	3.01	799.01	1.30	2.01	10.21	806.21	1.64	2.54	5.31
10/11/03 01:20	3.01	799.01	1.29	1.99	10.21	806.21	1.62	2.51	5.29
10/11/03 01:25	3.01	799.01	1.27	1.97	10.21	806.21	1.60	2.48	5.28
10/11/03 01:30	3.01	799.01	1.26	1.95	10.21	806.21	1.58	2.45	5.26
10/11/03 01:35	3.01	799.01	1.26	1.94	10.20	806.20	1.56	2.41	5.24
10/11/03 01:40	3.01	799.01	1.23	1.90	10.20	806.20	1.54	2.38	5.22
10/11/03 01:45	3.01	799.01	1.22	1.88	10.20	806.20	1.52	2.35	5.20
10/11/03 01:50	3.01	799.01	1.21	1.86	10.20	806.20	1.50	2.33	5.19
10/11/03 01:55	3.01	799.01	1.19	1.85	10.20	806.20	1.48	2.30	5.17
10/11/03 02:00	3.01	799.01	1.18	1.83	10.20	806.20	1.47	2.27	5.15
10/11/03 02:05	3.01	799.01	1.17	1.81	10.19	806.19	1.45	2.24	5.13
10/11/03 02:10	3.01	799.01	1.16	1.80	10.19	806.19	1.43	2.22	5.12
10/11/03 02:15	3.01	799.01	1.15	1.78	10.19	806.19	1.42	2.19	5.10
10/11/03 02:20	3.01	799.01	1.14	1.77	10.19	806.19	1.40	2.17	5.09
10/11/03 02:25	3.01	799.01	1.13	1.75	10.19	806.19	1.38	2.14	5.07
10/11/03 02:30	3.01	799.01	1.13	1.74	10.19	806.19	1.37	2.12	5.06
10/11/03 02:35	3.01	799.01	1.12	1.73	10.19	806.19	1.36	2.10	5.04
10/11/03 02:40	3.01	799.01	1.11	1.72	10.18	806.18	1.34	2.08	5.02
10/11/03 02:45	3.01	799.01	1.10	1.71	10.18	806.18	1.33	2.05	5.01
10/11/03 02:50	3.01	799.01	1.10	1.70	10.18	806.18	1.31	2.03	4.99
10/11/03 02:55	3.01	799.01	1.09	1.69	10.18	806.18	1.30	2.01	4.98
10/11/03 03:00	3.01	799.01	1.09	1.68	10.18	806.18	1.29	1.99	4.96
10/11/03 03:05	3.01	799.01	1.08	1.67	10.18	806.18	1.28	1.98	4.95
10/11/03 03:10	3.01	799.01	1.08	1.66	10.18	806.18	1.27	1.96	4.94
10/11/03 03:15	3.01	799.01	1.07	1.66	10.18	806.18	1.25	1.94	4.93
10/11/03 03:20	3.01	799.01	1.07	1.65	10.18	806.18	1.24	1.92	4.92
10/11/03 03:25	3.01	799.01	1.06	1.64	10.17	806.17	1.23	1.91	4.91
10/11/03 03:30	3.01	799.01	1.06	1.64	10.17	806.17	1.22	1.89	4.90
10/11/03 03:35	3.01	799.01	1.06	1.64	10.17	806.17	1.21	1.88	4.89
10/11/03 03:40	3.01	799.01	1.05	1.63	10.17	806.17	1.21	1.86	4.88
10/11/03 03:45	3.01	799.01	1.05	1.63	10.17	806.17	1.20	1.85	4.87
10/11/03 03:50	3.01	799.01	1.05	1.62	10.17	806.17	1.19	1.84	4.86
10/11/03 03:55	3.01	799.01	1.05	1.62	10.17	806.17	1.18	1.83	4.85
10/11/03 04:00	3.01	799.01	1.05	1.62	10.17	806.17	1.17	1.82	4.84
10/11/03 04:05	3.01	799.01	1.05	1.62	10.17	806.17	1.17	1.80	4.83
10/11/03 04:10	3.01	799.01	1.04	1.61	10.17	806.17	1.16	1.79	4.83
10/11/03 04:15	3.01	799.01	1.04	1.61	10.17	806.17	1.15	1.78	4.82
10/11/03 04:20	3.01	799.01	1.04	1.61	10.17	806.17	1.15	1.77	4.81
10/11/03 04:25	3.01	799.01	1.04	1.61	10.17	806.17	1.14	1.76	4.80
10/11/03 04:30	3.01	799.01	1.04	1.61	10.17	806.17	1.13	1.76	4.80
10/11/03 04:35	3.01	799.01	1.04	1.61	10.16	806.16	1.13	1.75	4.79
10/11/03 04:40	3.01	799.01	1.04	1.61	10.16	806.16	1.12	1.74	4.79
10/11/03 04:45	3.01	799.01	1.04	1.60	10.16	806.16	1.12	1.73	4.78
10/11/03 04:50	3.01	799.01	1.04	1.60	10.16	806.16	1.11	1.73	4.78
10/11/03 04:55	3.01	799.01	1.04	1.60	10.16	806.16	1.11	1.72	4.77
10/11/03 05:00	3.01	799.01	1.03	1.60	10.16	806.16	1.11	1.71	4.77
10/11/03 05:05	3.01	799.01	1.03	1.60	10.16	806.16	1.10	1.71	4.76
10/11/03 05:10	3.01	799.01	1.03	1.60	10.16	806.16	1.10	1.70	4.76
10/11/03 05:15	3.01	799.01	1.03	1.60	10.16	806.16	1.09	1.69	4.75
10/11/03 05:20	3.01	799.01	1.03	1.60	10.16	806.16	1.09	1.69	4.75
10/11/03 05:25	3.01	799.01	1.03	1.60	10.16	806.16	1.09	1.68	4.74
10/11/03 05:30	3.01	799.01	1.03	1.59	10.16	806.16	1.09	1.68	4.74
10/11/03 05:35	3.01	799.01	1.03	1.59	10.16	806.16	1.08	1.67	4.74

10/11/03 05:40	3.01	799.01	1.03	1.59	10.16	806.16	1.08	1.67	4.73
10/11/03 05:45	3.01	799.01	1.03	1.59	10.16	806.16	1.08	1.67	4.73
10/11/03 05:50	3.01	799.01	1.03	1.59	10.16	806.16	1.07	1.66	4.73
10/11/03 05:55	3.01	799.01	1.03	1.59	10.16	806.16	1.07	1.66	4.72
10/11/03 06:00	3.01	799.01	1.03	1.59	10.16	806.16	1.07	1.65	4.72
10/11/03 06:05	3.01	799.01	1.03	1.59	10.16	806.16	1.07	1.65	4.72
10/11/03 06:10	3.01	799.01	1.02	1.59	10.16	806.16	1.06	1.65	4.71
10/11/03 06:15	3.01	799.01	1.02	1.58	10.16	806.16	1.06	1.64	4.71
10/11/03 06:20	3.01	799.01	1.02	1.58	10.16	806.16	1.06	1.64	4.71
10/11/03 06:25	3.01	799.01	1.02	1.58	10.16	806.16	1.06	1.64	4.71
10/11/03 06:30	3.01	799.01	1.02	1.58	10.16	806.16	1.06	1.63	4.70
10/11/03 06:35	3.01	799.01	1.02	1.58	10.16	806.16	1.05	1.63	4.70
10/11/03 06:40	3.01	799.01	1.02	1.58	10.16	806.16	1.05	1.63	4.70
10/11/03 06:45	3.01	799.01	1.02	1.58	10.16	806.16	1.05	1.62	4.70
10/11/03 06:50	3.01	799.01	1.02	1.57	10.16	806.16	1.05	1.62	4.70
10/11/03 06:55	3.01	799.01	1.02	1.57	10.16	806.16	1.05	1.62	4.69
10/11/03 07:00	3.01	799.01	1.02	1.57	10.16	806.16	1.05	1.62	4.69
10/11/03 07:05	3.01	799.01	1.01	1.57	10.16	806.16	1.04	1.61	4.69
10/11/03 07:10	3.01	799.01	1.01	1.57	10.16	806.16	1.04	1.61	4.69
10/11/03 07:15	3.01	799.01	1.01	1.57	10.16	806.16	1.04	1.61	4.69
10/11/03 07:20	3.01	799.01	1.01	1.56	10.16	806.16	1.04	1.61	4.68
10/11/03 07:25	3.01	799.01	1.01	1.56	10.16	806.16	1.04	1.60	4.68
10/11/03 07:30	3.01	799.01	1.01	1.56	10.16	806.16	1.04	1.60	4.68
10/11/03 07:35	3.01	799.01	1.01	1.56	10.16	806.16	1.03	1.60	4.68
10/11/03 07:40	3.01	799.01	1.01	1.56	10.16	806.16	1.03	1.60	4.68
10/11/03 07:45	3.01	799.01	1.01	1.56	10.16	806.16	1.03	1.60	4.67
10/11/03 07:50	3.01	799.01	1.01	1.56	10.16	806.16	1.03	1.59	4.67
10/11/03 07:55	3.01	799.01	1.00	1.55	10.15	806.15	1.03	1.59	4.67
10/11/03 08:00	3.01	799.01	1.00	1.55	10.15	806.15	1.03	1.59	4.67
10/11/03 08:05	3.01	799.01	1.00	1.55	10.15	806.15	1.03	1.59	4.67
10/11/03 08:10	3.01	799.01	1.00	1.55	10.15	806.15	1.02	1.59	4.67
10/11/03 08:15	3.01	799.01	1.00	1.55	10.15	806.15	1.02	1.58	4.66
10/11/03 08:20	3.01	799.01	1.00	1.54	10.15	806.15	1.02	1.58	4.66
10/11/03 08:25	3.01	799.01	1.00	1.54	10.15	806.15	1.02	1.58	4.66
10/11/03 08:30	3.01	799.01	1.00	1.54	10.15	806.15	1.02	1.58	4.66
10/11/03 08:35	3.01	799.01	1.00	1.54	10.15	806.15	1.02	1.58	4.66
10/11/03 08:40	3.01	799.01	0.99	1.54	10.15	806.15	1.02	1.57	4.66
10/11/03 08:45	3.01	799.01	0.99	1.54	10.15	806.15	1.02	1.57	4.66
10/11/03 08:50	3.01	799.01	0.99	1.53	10.15	806.15	1.01	1.57	4.65
10/11/03 08:55	3.01	799.01	0.99	1.53	10.15	806.15	1.01	1.57	4.65
10/11/03 09:00	3.01	799.01	0.99	1.53	10.15	806.15	1.01	1.57	4.65
10/11/03 09:05	3.01	799.01	0.99	1.53	10.15	806.15	1.01	1.56	4.65
10/11/03 09:10	3.01	799.01	0.99	1.53	10.15	806.15	1.01	1.56	4.65
10/11/03 09:15	3.01	799.01	0.99	1.53	10.15	806.15	1.01	1.56	4.65
10/11/03 09:20	3.01	799.01	0.98	1.52	10.15	806.15	1.01	1.56	4.64
10/11/03 09:25	3.01	799.01	0.98	1.52	10.15	806.15	1.01	1.56	4.64
10/11/03 09:30	3.01	799.01	0.98	1.52	10.15	806.15	1.00	1.55	4.64
10/11/03 09:35	3.01	799.01	0.98	1.52	10.15	806.15	1.00	1.55	4.64
10/11/03 09:40	3.01	799.01	0.98	1.52	10.15	806.15	1.00	1.55	4.64
10/11/03 09:45	3.01	799.01	0.98	1.51	10.15	806.15	1.00	1.55	4.64
10/11/03 09:50	3.01	799.01	0.98	1.51	10.15	806.15	1.00	1.55	4.63
10/11/03 09:55	3.01	799.01	0.98	1.51	10.15	806.15	1.00	1.54	4.63
10/11/03 10:00	3.01	799.01	0.97	1.51	10.15	806.15	1.00	1.54	4.63
10/11/03 10:05	3.01	799.01	0.97	1.51	10.15	806.15	1.00	1.54	4.63
10/11/03 10:10	3.01	799.01	0.97	1.50	10.15	806.15	0.99	1.54	4.63
10/11/03 10:15	3.01	799.01	0.97	1.50	10.15	806.15	0.99	1.54	4.63
10/11/03 10:20	3.01	799.01	0.97	1.50	10.15	806.15	0.99	1.54	4.62
10/11/03 10:25	3.01	799.01	0.97	1.50	10.15	806.15	0.99	1.53	4.62
10/11/03 10:30	3.01	799.01	0.97	1.50	10.15	806.15	0.99	1.53	4.62
10/11/03 10:35	3.01	799.01	0.97	1.49	10.15	806.15	0.99	1.53	4.62
10/11/03 10:40	3.01	799.01	0.96	1.49	10.15	806.15	0.99	1.53	4.62
10/11/03 10:45	3.01	799.01	0.96	1.49	10.15	806.15	0.99	1.53	4.61
10/11/03 10:50	3.01	799.01	0.96	1.49	10.15	806.15	0.99	1.52	4.61
10/11/03 10:55	3.01	799.01	0.96	1.49	10.15	806.15	0.98	1.52	4.61
10/11/03 11:00	3.01	799.01	0.96	1.49	10.15	806.15	0.98	1.52	4.61
10/11/03 11:05	3.01	799.01	0.96	1.48	10.15	806.15	0.98	1.52	4.61
10/11/03 11:10	3.01	799.01	0.96	1.48	10.15	806.15	0.98	1.52	4.61
10/11/03 11:15	3.01	799.01	0.96	1.48	10.15	806.15	0.98	1.51	4.60

10/11/03 11:20	3.01	799.01	0.95	1.48	10.15	806.15	0.98	1.51	4.60
10/11/03 11:25	3.01	799.01	0.95	1.48	10.15	806.15	0.98	1.51	4.60
10/11/03 11:30	3.01	799.01	0.95	1.47	10.15	806.15	0.98	1.51	4.60
10/11/03 11:35	3.01	799.01	0.95	1.47	10.15	806.15	0.97	1.51	4.60
10/11/03 11:40	3.01	799.01	0.95	1.47	10.15	806.15	0.97	1.50	4.59
10/11/03 11:45	3.01	799.01	0.95	1.47	10.15	806.15	0.97	1.50	4.59
10/11/03 11:50	3.01	799.01	0.95	1.47	10.15	806.15	0.97	1.50	4.59
10/11/03 11:55	3.01	799.01	0.95	1.46	10.15	806.15	0.97	1.50	4.59
10/11/03 12:00	3.01	799.01	0.94	1.46	10.15	806.15	0.97	1.50	4.59
10/11/03 12:05	3.01	799.01	0.94	1.46	10.15	806.15	0.97	1.50	4.59
10/11/03 12:10	3.01	799.01	0.94	1.46	10.15	806.15	0.97	1.49	4.58
10/11/03 12:15	3.01	799.01	0.94	1.46	10.15	806.15	0.96	1.49	4.58
10/11/03 12:20	3.01	799.01	0.94	1.45	10.15	806.15	0.96	1.49	4.58
10/11/03 12:25	3.01	799.01	0.94	1.45	10.15	806.15	0.96	1.49	4.58
10/11/03 12:30	3.01	799.01	0.94	1.45	10.15	806.15	0.96	1.49	4.58
10/11/03 12:35	3.01	799.01	0.94	1.45	10.15	806.15	0.96	1.48	4.57
10/11/03 12:40	3.01	799.01	0.93	1.45	10.15	806.15	0.96	1.48	4.57
10/11/03 12:45	3.01	799.01	0.93	1.44	10.15	806.15	0.96	1.48	4.57
10/11/03 12:50	3.01	799.01	0.93	1.44	10.15	806.15	0.96	1.48	4.57
10/11/03 12:55	3.01	799.01	0.93	1.44	10.15	806.15	0.95	1.48	4.57
10/11/03 13:00	3.01	799.01	0.93	1.44	10.15	806.15	0.95	1.47	4.56
10/11/03 13:05	3.01	799.01	0.93	1.43	10.15	806.15	0.95	1.47	4.56
10/11/03 13:10	3.01	799.01	0.93	1.43	10.15	806.15	0.95	1.47	4.56
10/11/03 13:15	3.01	799.01	0.92	1.43	10.15	806.15	0.95	1.47	4.56
10/11/03 13:20	3.01	799.01	0.92	1.43	10.15	806.15	0.95	1.47	4.56
10/11/03 13:25	3.01	799.01	0.92	1.43	10.15	806.15	0.95	1.46	4.55
10/11/03 13:30	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/11/03 13:35	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/11/03 13:40	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/11/03 13:45	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/11/03 13:50	3.01	799.01	0.91	1.41	10.15	806.15	0.94	1.45	4.54
10/11/03 13:55	3.01	799.01	0.91	1.41	10.15	806.15	0.94	1.45	4.54
10/11/03 14:00	3.01	799.01	0.91	1.41	10.15	806.15	0.94	1.45	4.54
10/11/03 14:05	3.01	799.01	0.91	1.41	10.15	806.15	0.94	1.45	4.54
10/11/03 14:10	3.01	799.01	0.91	1.40	10.15	806.15	0.93	1.44	4.54
10/11/03 14:15	3.01	799.01	0.90	1.40	10.15	806.15	0.93	1.44	4.53
10/11/03 14:20	3.01	799.01	0.90	1.40	10.14	806.14	0.93	1.44	4.53
10/11/03 14:25	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.44	4.53
10/11/03 14:30	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.44	4.53
10/11/03 14:35	3.01	799.01	0.90	1.39	10.14	806.14	0.93	1.43	4.53
10/11/03 14:40	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.43	4.52
10/11/03 14:45	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.43	4.52
10/11/03 14:50	3.01	799.01	0.89	1.38	10.14	806.14	0.92	1.43	4.52
10/11/03 14:55	3.01	799.01	0.89	1.37	10.14	806.14	0.92	1.42	4.52
10/11/03 15:00	3.01	799.01	0.89	1.37	10.14	806.14	0.92	1.42	4.51
10/11/03 15:05	3.01	799.01	0.88	1.37	10.14	806.14	0.92	1.42	4.51
10/11/03 15:10	3.01	799.01	0.88	1.36	10.14	806.14	0.91	1.42	4.51
10/11/03 15:15	3.01	799.01	0.88	1.36	10.14	806.14	0.91	1.41	4.50
10/11/03 15:20	3.01	799.01	0.88	1.36	10.14	806.14	0.91	1.41	4.50
10/11/03 15:25	3.01	799.01	0.88	1.35	10.14	806.14	0.91	1.41	4.50
10/11/03 15:30	3.01	799.01	0.87	1.35	10.14	806.14	0.91	1.40	4.50
10/11/03 15:35	3.01	799.01	0.87	1.35	10.14	806.14	0.91	1.40	4.49
10/11/03 15:40	3.01	799.01	0.87	1.34	10.14	806.14	0.90	1.40	4.49
10/11/03 15:45	3.01	799.01	0.87	1.34	10.14	806.14	0.90	1.40	4.49
10/11/03 15:50	3.01	799.01	0.86	1.34	10.14	806.14	0.90	1.39	4.48
10/11/03 15:55	3.01	799.01	0.86	1.33	10.14	806.14	0.90	1.39	4.48
10/11/03 16:00	3.01	799.01	0.86	1.33	10.14	806.14	0.90	1.39	4.48
10/11/03 16:05	3.01	799.01	0.86	1.32	10.14	806.14	0.89	1.38	4.48
10/11/03 16:10	3.01	799.01	0.85	1.32	10.14	806.14	0.89	1.38	4.47
10/11/03 16:15	3.01	799.01	0.85	1.32	10.14	806.14	0.89	1.38	4.47
10/11/03 16:20	3.01	799.01	0.85	1.31	10.14	806.14	0.89	1.37	4.47
10/11/03 16:25	3.01	799.01	0.85	1.31	10.14	806.14	0.89	1.37	4.46
10/11/03 16:30	3.01	799.01	0.84	1.31	10.14	806.14	0.88	1.37	4.46
10/11/03 16:35	3.01	799.01	0.84	1.30	10.14	806.14	0.88	1.36	4.46
10/11/03 16:40	3.01	799.01	0.84	1.30	10.14	806.14	0.88	1.36	4.45
10/11/03 16:45	3.01	799.01	0.84	1.29	10.14	806.14	0.88	1.36	4.45
10/11/03 16:50	3.01	799.01	0.83	1.29	10.14	806.14	0.88	1.35	4.45
10/11/03 16:55	3.01	799.01	0.83	1.29	10.14	806.14	0.87	1.35	4.44

10/11/03 17:00	3.01	799.01	0.83	1.28	10.14	806.14	0.87	1.35	4.44
10/11/03 17:05	3.01	799.01	0.83	1.28	10.14	806.14	0.87	1.34	4.44
10/11/03 17:10	3.01	799.01	0.82	1.27	10.14	806.14	0.87	1.34	4.43
10/11/03 17:15	3.01	799.01	0.82	1.27	10.14	806.14	0.86	1.34	4.43
10/11/03 17:20	3.01	799.01	0.82	1.27	10.14	806.14	0.86	1.33	4.43
10/11/03 17:25	3.01	799.01	0.82	1.26	10.14	806.14	0.86	1.33	4.42
10/11/03 17:30	3.01	799.01	0.81	1.26	10.14	806.14	0.86	1.33	4.42
10/11/03 17:35	3.01	799.01	0.81	1.25	10.14	806.14	0.86	1.32	4.42
10/11/03 17:40	3.01	799.01	0.81	1.25	10.14	806.14	0.85	1.32	4.42
10/11/03 17:45	3.01	799.01	0.80	1.24	10.14	806.14	0.85	1.32	4.41
10/11/03 17:50	3.01	799.01	0.80	1.24	10.14	806.14	0.85	1.31	4.41
10/11/03 17:55	3.01	799.01	0.80	1.24	10.14	806.14	0.85	1.31	4.41
10/11/03 18:00	3.01	799.01	0.80	1.23	10.14	806.14	0.84	1.30	4.40
10/11/03 18:05	3.01	799.01	0.79	1.23	10.14	806.14	0.84	1.30	4.40
10/11/03 18:10	3.01	799.01	0.79	1.22	10.14	806.14	0.84	1.30	4.40
10/11/03 18:15	3.01	799.01	0.79	1.22	10.13	806.13	0.84	1.29	4.39
10/11/03 18:20	3.01	799.01	0.79	1.22	10.13	806.13	0.83	1.29	4.39
10/11/03 18:25	3.01	799.01	0.78	1.21	10.13	806.13	0.83	1.29	4.39
10/11/03 18:30	3.01	799.01	0.78	1.21	10.13	806.13	0.83	1.28	4.38
10/11/03 18:35	3.01	799.01	0.78	1.20	10.13	806.13	0.83	1.28	4.38
10/11/03 18:40	3.01	799.01	0.78	1.20	10.13	806.13	0.82	1.27	4.38
10/11/03 18:45	3.01	799.01	0.77	1.20	10.13	806.13	0.82	1.27	4.37
10/11/03 18:50	3.01	799.01	0.77	1.19	10.13	806.13	0.82	1.27	4.37
10/11/03 18:55	3.01	799.01	0.77	1.19	10.13	806.13	0.82	1.26	4.37
10/11/03 19:00	3.01	799.01	0.77	1.18	10.13	806.13	0.81	1.26	4.36
10/11/03 19:05	3.01	799.01	0.76	1.18	10.13	806.13	0.81	1.26	4.36
10/11/03 19:10	3.01	799.01	0.76	1.18	10.13	806.13	0.81	1.25	4.36
10/11/03 19:15	3.01	799.01	0.76	1.17	10.13	806.13	0.81	1.25	4.35
10/11/03 19:20	3.01	799.01	0.76	1.17	10.13	806.13	0.80	1.24	4.35
10/11/03 19:25	3.01	799.01	0.75	1.17	10.13	806.13	0.80	1.24	4.35
10/11/03 19:30	3.01	799.01	0.75	1.17	10.13	806.13	0.80	1.24	4.34
10/11/03 19:35	3.01	799.01	0.75	1.16	10.13	806.13	0.80	1.23	4.34
10/11/03 19:40	3.01	799.01	0.75	1.16	10.13	806.13	0.79	1.23	4.34
10/11/03 19:45	3.01	799.01	0.74	1.15	10.13	806.13	0.79	1.23	4.33
10/11/03 19:50	3.01	799.01	0.74	1.15	10.13	806.13	0.79	1.22	4.33
10/11/03 19:55	3.01	799.01	0.74	1.14	10.13	806.13	0.79	1.22	4.33
10/11/03 20:00	3.01	799.01	0.73	1.14	10.13	806.13	0.78	1.21	4.32
10/11/03 20:05	3.01	799.01	0.73	1.13	10.13	806.13	0.78	1.21	4.32
10/11/03 20:10	3.01	799.01	0.73	1.13	10.13	806.13	0.78	1.21	4.32
10/11/03 20:15	3.01	799.01	0.73	1.12	10.13	806.13	0.78	1.20	4.31
10/11/03 20:20	3.01	799.01	0.72	1.12	10.13	806.13	0.77	1.20	4.31
10/11/03 20:25	3.01	799.01	0.72	1.12	10.13	806.13	0.77	1.19	4.31
10/11/03 20:30	3.01	799.01	0.72	1.11	10.13	806.13	0.77	1.19	4.30
10/11/03 20:35	3.01	799.01	0.72	1.11	10.13	806.13	0.77	1.19	4.30
10/11/03 20:40	3.01	799.01	0.72	1.11	10.13	806.13	0.76	1.18	4.30
10/11/03 20:45	3.01	799.01	0.71	1.10	10.13	806.13	0.76	1.18	4.29
10/11/03 20:50	3.01	799.01	0.71	1.10	10.13	806.13	0.76	1.18	4.29
10/11/03 20:55	3.01	799.01	0.71	1.10	10.13	806.13	0.76	1.17	4.29
10/11/03 21:00	3.01	799.01	0.71	1.10	10.13	806.13	0.76	1.17	4.28
10/11/03 21:05	3.01	799.01	0.71	1.09	10.13	806.13	0.75	1.16	4.28
10/11/03 21:10	3.01	799.01	0.70	1.09	10.13	806.13	0.75	1.16	4.28
10/11/03 21:15	3.01	799.01	0.70	1.09	10.13	806.13	0.75	1.16	4.27
10/11/03 21:20	3.01	799.01	0.70	1.08	10.13	806.13	0.75	1.15	4.27
10/11/03 21:25	3.01	799.01	0.70	1.08	10.12	806.12	0.74	1.15	4.27
10/11/03 21:30	3.01	799.01	0.70	1.08	10.12	806.12	0.74	1.15	4.26
10/11/03 21:35	3.01	799.01	0.70	1.08	10.12	806.12	0.74	1.14	4.26
10/11/03 21:40	3.01	799.01	0.69	1.07	10.12	806.12	0.74	1.14	4.26
10/11/03 21:45	3.01	799.01	0.69	1.07	10.12	806.12	0.74	1.14	4.25
10/11/03 21:50	3.01	799.01	0.69	1.07	10.12	806.12	0.73	1.13	4.25
10/11/03 21:55	3.01	799.01	0.69	1.07	10.12	806.12	0.73	1.13	4.25
10/11/03 22:00	3.01	799.01	0.69	1.07	10.12	806.12	0.73	1.13	4.24
10/11/03 22:05	3.01	799.01	0.69	1.06	10.12	806.12	0.73	1.12	4.24
10/11/03 22:10	3.01	799.01	0.69	1.06	10.12	806.12	0.73	1.12	4.24
10/11/03 22:15	3.01	799.01	0.69	1.06	10.12	806.12	0.72	1.12	4.24
10/11/03 22:20	3.01	799.01	0.69	1.06	10.12	806.12	0.72	1.12	4.23
10/11/03 22:25	3.01	799.01	0.68	1.06	10.12	806.12	0.72	1.11	4.23
10/11/03 22:30	3.01	799.01	0.68	1.06	10.12	806.12	0.72	1.11	4.23
10/11/03 22:35	3.01	799.01	0.68	1.05	10.12	806.12	0.72	1.11	4.22

10/11/03 22:40	3.01	799.01	0.68	1.05	10.12	806.12	0.71	1.11	4.22
10/11/03 22:45	3.01	799.01	0.68	1.05	10.12	806.12	0.71	1.10	4.22
10/11/03 22:50	3.01	799.01	0.68	1.05	10.12	806.12	0.71	1.10	4.22
10/11/03 22:55	3.01	799.01	0.67	1.04	10.12	806.12	0.71	1.10	4.21
10/11/03 23:00	3.01	799.01	0.67	1.04	10.12	806.12	0.71	1.10	4.21
10/11/03 23:05	3.01	799.01	0.67	1.04	10.12	806.12	0.71	1.09	4.21
10/11/03 23:10	3.01	799.01	0.67	1.04	10.12	806.12	0.70	1.09	4.21
10/11/03 23:15	3.01	799.01	0.67	1.04	10.12	806.12	0.70	1.09	4.20
10/11/03 23:20	3.01	799.01	0.67	1.03	10.12	806.12	0.70	1.08	4.20
10/11/03 23:25	3.01	799.01	0.67	1.03	10.12	806.12	0.70	1.08	4.20
10/11/03 23:30	3.01	799.01	0.67	1.03	10.12	806.12	0.70	1.08	4.20
10/11/03 23:35	3.01	799.01	0.66	1.03	10.12	806.12	0.70	1.08	4.19
10/11/03 23:40	3.01	799.01	0.66	1.03	10.12	806.12	0.69	1.08	4.19
10/11/03 23:45	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.07	4.19
10/11/03 23:50	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.07	4.19
10/11/03 23:55	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.07	4.18
10/12/03 00:00	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.07	4.18
10/12/03 00:05	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.06	4.18
10/12/03 00:10	3.01	799.01	0.66	1.02	10.12	806.12	0.69	1.06	4.18
10/12/03 00:15	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.06	4.17
10/12/03 00:20	3.01	799.01	0.66	1.01	10.12	806.12	0.68	1.06	4.17
10/12/03 00:25	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.06	4.17
10/12/03 00:30	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.17
10/12/03 00:35	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/12/03 00:40	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/12/03 00:45	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/12/03 00:50	3.01	799.01	0.65	1.01	10.12	806.12	0.68	1.05	4.16
10/12/03 00:55	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/12/03 01:00	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/12/03 01:05	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/12/03 01:10	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/12/03 01:15	3.01	799.01	0.65	1.00	10.12	806.12	0.67	1.04	4.15
10/12/03 01:20	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.03	4.14
10/12/03 01:25	3.01	799.01	0.64	1.00	10.12	806.12	0.67	1.03	4.14
10/12/03 01:30	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/12/03 01:35	3.01	799.01	0.64	0.99	10.12	806.12	0.67	1.03	4.14
10/12/03 01:40	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.03	4.13
10/12/03 01:45	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.03	4.13
10/12/03 01:50	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/12/03 01:55	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/12/03 02:00	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.13
10/12/03 02:05	3.01	799.01	0.64	0.99	10.12	806.12	0.66	1.02	4.12
10/12/03 02:10	3.01	799.01	0.64	0.98	10.11	806.11	0.66	1.02	4.12
10/12/03 02:15	3.01	799.01	0.64	0.98	10.11	806.11	0.66	1.02	4.12
10/12/03 02:20	3.01	799.01	0.63	0.98	10.11	806.11	0.66	1.01	4.12
10/12/03 02:25	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.12
10/12/03 02:30	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.12
10/12/03 02:35	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/12/03 02:40	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/12/03 02:45	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.01	4.11
10/12/03 02:50	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.01	4.11
10/12/03 02:55	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.11
10/12/03 03:00	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/12/03 03:05	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/12/03 03:10	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/12/03 03:15	3.01	799.01	0.63	0.97	10.11	806.11	0.65	1.00	4.10
10/12/03 03:20	3.01	799.01	0.63	0.97	10.11	806.11	0.64	1.00	4.10
10/12/03 03:25	3.01	799.01	0.62	0.97	10.11	806.11	0.64	1.00	4.10
10/12/03 03:30	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 03:35	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.99	4.09
10/12/03 03:40	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.99	4.09
10/12/03 03:45	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.99	4.09
10/12/03 03:50	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.99	4.09
10/12/03 03:55	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 04:00	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 04:05	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.08
10/12/03 04:10	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.08
10/12/03 04:15	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.98	4.08

10/12/03 04:20	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.98	4.08
10/12/03 04:25	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/12/03 04:30	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/12/03 04:35	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/12/03 04:40	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.98	4.08
10/12/03 04:45	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.98	4.07
10/12/03 04:50	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.98	4.07
10/12/03 04:55	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.98	4.07
10/12/03 05:00	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 05:05	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 05:10	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.07
10/12/03 05:15	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/12/03 05:20	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/12/03 05:25	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/12/03 05:30	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/12/03 05:35	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/12/03 05:40	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.06
10/12/03 05:45	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 05:50	3.01	799.01	0.60	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 05:55	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/12/03 06:00	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/12/03 06:05	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/12/03 06:10	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/12/03 06:15	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/12/03 06:20	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 06:25	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 06:30	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 06:35	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/12/03 06:40	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/12/03 06:45	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.04
10/12/03 06:50	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.04
10/12/03 06:55	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.03
10/12/03 07:00	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.03
10/12/03 07:05	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 07:10	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 07:15	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 07:20	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 07:25	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 07:30	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/12/03 07:35	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/12/03 07:40	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.94	4.02
10/12/03 07:45	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.94	4.02
10/12/03 07:50	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/12/03 07:55	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/12/03 08:00	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/12/03 08:05	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:10	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:15	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:20	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:25	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:30	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:35	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 08:40	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.01
10/12/03 08:45	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 08:50	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 08:55	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 09:00	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 09:05	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 09:10	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 09:15	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 09:20	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 09:25	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	3.99
10/12/03 09:30	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	3.99
10/12/03 09:35	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.91	3.99
10/12/03 09:40	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 09:45	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 09:50	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 09:55	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99

10/12/03 10:00	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 10:05	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 10:10	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.98
10/12/03 10:15	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/12/03 10:20	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/12/03 10:25	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/12/03 10:30	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/12/03 10:35	3.01	799.01	0.57	0.89	10.11	806.11	0.58	0.90	3.98
10/12/03 10:40	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/12/03 10:45	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/12/03 10:50	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/12/03 10:55	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:00	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:05	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:10	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:15	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:20	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:25	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:30	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/12/03 11:35	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.89	3.96
10/12/03 11:40	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.89	3.96
10/12/03 11:45	3.01	799.01	0.57	0.87	10.11	806.11	0.58	0.89	3.96
10/12/03 11:50	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/12/03 11:55	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/12/03 12:00	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/12/03 12:05	3.01	799.01	0.56	0.87	10.11	806.11	0.57	0.89	3.96
10/12/03 12:10	3.01	799.01	0.56	0.87	10.11	806.11	0.57	0.89	3.96
10/12/03 12:15	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.96
10/12/03 12:20	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.96
10/12/03 12:25	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.95
10/12/03 12:30	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.95
10/12/03 12:35	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.88	3.95
10/12/03 12:40	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.88	3.95
10/12/03 12:45	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.88	3.95
10/12/03 12:50	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 12:55	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 13:00	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 13:05	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/12/03 13:10	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.94
10/12/03 13:15	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.94
10/12/03 13:20	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.94
10/12/03 13:25	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.94
10/12/03 13:30	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/12/03 13:35	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/12/03 13:40	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.87	3.94
10/12/03 13:45	3.01	799.01	0.55	0.86	10.10	806.10	0.56	0.87	3.94
10/12/03 13:50	3.01	799.01	0.55	0.86	10.10	806.10	0.56	0.87	3.94
10/12/03 13:55	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:00	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:05	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:10	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:15	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:20	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:25	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:30	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:35	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/12/03 14:40	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.86	3.92
10/12/03 14:45	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.86	3.92
10/12/03 14:50	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.86	3.92
10/12/03 14:55	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.86	3.92
10/12/03 15:00	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 15:05	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 15:10	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 15:15	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 15:20	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/12/03 15:25	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/12/03 15:30	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/12/03 15:35	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91

10/12/03 15:40	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/12/03 15:45	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.85	3.91
10/12/03 15:50	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.85	3.91
10/12/03 15:55	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.85	3.91
10/12/03 16:00	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.85	3.91
10/12/03 16:05	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/12/03 16:10	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:15	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:20	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:25	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:30	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:35	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:40	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:45	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/12/03 16:50	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.84	3.90
10/12/03 16:55	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.84	3.90
10/12/03 17:00	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.84	3.89
10/12/03 17:05	3.01	799.01	0.53	0.83	10.10	806.10	0.54	0.84	3.89
10/12/03 17:10	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:15	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:20	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:25	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:30	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:35	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:40	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/12/03 17:45	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.88
10/12/03 17:50	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.88
10/12/03 17:55	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.83	3.88
10/12/03 18:00	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.83	3.88
10/12/03 18:05	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.83	3.88
10/12/03 18:10	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.83	3.88
10/12/03 18:15	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 18:20	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 18:25	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/12/03 18:30	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/12/03 18:35	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/12/03 18:40	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/12/03 18:45	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/12/03 18:50	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/12/03 18:55	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/12/03 19:00	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.82	3.87
10/12/03 19:05	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.82	3.87
10/12/03 19:10	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.82	3.87
10/12/03 19:15	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.82	3.86
10/12/03 19:20	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:25	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:30	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:35	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:40	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:45	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:50	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/12/03 19:55	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.85
10/12/03 20:00	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.85
10/12/03 20:05	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 20:10	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 20:15	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 20:20	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.81	3.85
10/12/03 20:25	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/12/03 20:30	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/12/03 20:35	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/12/03 20:40	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 20:45	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 20:50	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 20:55	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 21:00	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 21:05	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/12/03 21:10	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.80	3.84
10/12/03 21:15	3.01	799.01	1.71	2.64	10.10	806.10	0.54	0.84	3.89

10/12/03 21:20	3.01	799.01	0.75	1.16	10.11	806.11	0.58	0.91	3.98
10/12/03 21:25	3.01	799.01	0.57	0.87	10.11	806.11	0.59	0.91	3.99
10/12/03 21:30	3.01	799.01	0.52	0.81	10.11	806.11	0.59	0.91	3.99
10/12/03 21:35	3.01	799.01	0.51	0.79	10.11	806.11	0.59	0.91	3.98
10/12/03 21:40	3.01	799.01	0.51	0.78	10.11	806.11	0.58	0.90	3.97
10/12/03 21:45	3.01	799.01	0.51	0.78	10.11	806.11	0.58	0.90	3.97
10/12/03 21:50	3.01	799.01	0.51	0.78	10.11	806.11	0.58	0.89	3.96
10/12/03 21:55	3.01	799.01	0.50	0.78	10.10	806.10	0.57	0.89	3.95
10/12/03 22:00	3.01	799.01	0.50	0.78	10.10	806.10	0.57	0.88	3.95
10/12/03 22:05	3.01	799.01	0.50	0.78	10.10	806.10	0.57	0.88	3.94
10/12/03 22:10	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.87	3.93
10/12/03 22:15	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.87	3.93
10/12/03 22:20	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.86	3.92
10/12/03 22:25	3.01	799.01	0.50	0.78	10.10	806.10	0.56	0.86	3.92
10/12/03 22:30	3.01	799.01	0.50	0.78	10.10	806.10	0.55	0.86	3.91
10/12/03 22:35	3.01	799.01	0.50	0.77	10.10	806.10	0.55	0.85	3.91
10/12/03 22:40	3.01	799.01	0.50	0.77	10.10	806.10	0.55	0.85	3.90
10/12/03 22:45	3.01	799.01	0.50	0.77	10.10	806.10	0.55	0.85	3.90
10/12/03 22:50	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.84	3.89
10/12/03 22:55	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.84	3.89
10/12/03 23:00	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.84	3.88
10/12/03 23:05	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.83	3.88
10/12/03 23:10	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.83	3.88
10/12/03 23:15	3.01	799.01	0.50	0.77	10.10	806.10	0.54	0.83	3.87
10/12/03 23:20	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.83	3.87
10/12/03 23:25	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.86
10/12/03 23:30	3.01	799.01	0.50	0.77	10.10	806.10	0.53	0.82	3.86
10/12/03 23:35	3.01	799.01	0.49	0.77	10.10	806.10	0.53	0.82	3.86
10/12/03 23:40	3.01	799.01	0.49	0.76	10.10	806.10	0.53	0.82	3.85
10/12/03 23:45	3.01	799.01	0.49	0.76	10.10	806.10	0.53	0.81	3.85
10/12/03 23:50	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.85
10/12/03 23:55	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.84
10/13/03 00:00	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.84
10/13/03 00:05	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.81	3.84
10/13/03 00:10	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.84
10/13/03 00:15	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.83
10/13/03 00:20	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.83
10/13/03 00:25	3.01	799.01	0.49	0.76	10.10	806.10	0.52	0.80	3.83
10/13/03 00:30	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.80	3.82
10/13/03 00:35	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.82
10/13/03 00:40	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.82
10/13/03 00:45	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.79	3.81
10/13/03 00:50	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.79	3.81
10/13/03 00:55	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.79	3.81
10/13/03 01:00	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.79	3.81
10/13/03 01:05	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.78	3.80
10/13/03 01:10	3.01	799.01	0.49	0.75	10.10	806.10	0.51	0.78	3.80
10/13/03 01:15	3.01	799.01	0.48	0.75	10.10	806.10	0.51	0.78	3.80
10/13/03 01:20	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.80
10/13/03 01:25	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.80
10/13/03 01:30	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.79
10/13/03 01:35	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.79
10/13/03 01:40	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.78	3.79
10/13/03 01:45	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.79
10/13/03 01:50	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.79
10/13/03 01:55	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.79
10/13/03 02:00	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.78
10/13/03 02:05	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.78
10/13/03 02:10	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.78
10/13/03 02:15	3.01	799.01	0.48	0.74	10.10	806.10	0.50	0.77	3.78
10/13/03 02:20	3.01	799.01	0.48	0.74	10.10	806.10	0.49	0.77	3.78
10/13/03 02:25	3.01	799.01	0.48	0.74	10.10	806.10	0.49	0.76	3.78
10/13/03 02:30	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 02:35	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 02:40	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 02:45	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 02:50	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 02:55	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.77

10/13/03 03:00	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.76
10/13/03 03:05	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.76
10/13/03 03:10	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.76
10/13/03 03:15	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 03:20	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 03:25	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 03:30	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 03:35	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 03:40	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.76
10/13/03 03:45	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/13/03 03:50	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/13/03 03:55	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/13/03 04:00	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.75	3.75
10/13/03 04:05	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 04:10	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 04:15	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 04:20	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 04:25	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 04:30	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 04:35	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 04:40	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 04:45	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 04:50	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 04:55	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 05:00	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 05:05	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:10	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:15	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:20	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:25	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:30	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:35	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:40	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:45	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 05:50	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/13/03 05:55	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/13/03 06:00	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/13/03 06:05	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.72	3.72
10/13/03 06:10	3.01	799.01	0.46	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 06:15	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 06:20	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 06:25	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 06:30	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 06:35	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.71
10/13/03 06:40	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 06:45	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 06:50	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 06:55	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 07:00	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 07:05	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.71
10/13/03 07:10	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.71	3.71
10/13/03 07:15	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.71
10/13/03 07:20	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:25	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:30	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:35	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:40	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:45	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:50	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 07:55	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 08:00	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 08:05	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.69
10/13/03 08:10	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.70	3.69
10/13/03 08:15	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.69
10/13/03 08:20	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 08:25	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 08:30	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 08:35	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69

10/13/03 08:40	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 08:45	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 08:50	3.01	799.01	0.44	0.69	10.09	806.09	0.45	0.70	3.68
10/13/03 08:55	3.01	799.01	0.45	0.69	10.09	806.09	0.45	0.70	3.68
10/13/03 09:00	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 09:05	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 09:10	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 09:15	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 09:20	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.69	3.68
10/13/03 09:25	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.68
10/13/03 09:30	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.68
10/13/03 09:35	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.69	3.68
10/13/03 09:40	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 09:45	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 09:50	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 09:55	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 10:00	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 10:05	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 10:10	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 10:15	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 10:20	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 10:25	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 10:30	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.68	3.66
10/13/03 10:35	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 10:40	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 10:45	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 10:50	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 10:55	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 11:00	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 11:05	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 11:10	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 11:15	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 11:20	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 11:25	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 11:30	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.67	3.65
10/13/03 11:35	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.67	3.65
10/13/03 11:40	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 11:45	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 11:50	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 11:55	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:00	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:05	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:10	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:15	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:20	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:25	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:30	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 12:35	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.66	3.63
10/13/03 12:40	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 12:45	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 12:50	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 12:55	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 13:00	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 13:05	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 13:10	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 13:15	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 13:20	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 13:25	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 13:30	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 13:35	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 13:40	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.62
10/13/03 13:45	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.65	3.61
10/13/03 13:50	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 13:55	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 14:00	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 14:05	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 14:10	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 14:15	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61

10/13/03 14:20	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60
10/13/03 14:25	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.60
10/13/03 14:30	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/13/03 14:35	3.01	799.01	0.41	0.63	10.08	806.08	0.42	0.65	3.60
10/13/03 14:40	3.01	799.01	0.40	0.63	10.08	806.08	0.42	0.65	3.60
10/13/03 14:45	3.01	799.01	0.40	0.63	10.08	806.08	0.42	0.64	3.60
10/13/03 14:50	3.01	799.01	0.40	0.63	10.08	806.08	0.42	0.64	3.60
10/13/03 14:55	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.64	3.60
10/13/03 15:00	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.64	3.59
10/13/03 15:05	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 15:10	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 15:15	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 15:20	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 15:25	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 15:30	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.59
10/13/03 15:35	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/13/03 15:40	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/13/03 15:45	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.64	3.58
10/13/03 15:50	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 15:55	3.01	799.01	0.40	0.62	10.08	806.08	0.41	0.63	3.58
10/13/03 16:00	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/13/03 16:05	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/13/03 16:10	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.58
10/13/03 16:15	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 16:20	3.01	799.01	0.40	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 16:25	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 16:30	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 16:35	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 16:40	3.01	799.01	0.39	0.61	10.08	806.08	0.41	0.63	3.57
10/13/03 16:45	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.57
10/13/03 16:50	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.63	3.56
10/13/03 16:55	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 17:00	3.01	799.01	0.39	0.61	10.08	806.08	0.40	0.62	3.56
10/13/03 17:05	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 17:10	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 17:15	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 17:20	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 17:25	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.56
10/13/03 17:30	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 17:35	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 17:40	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 17:45	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 17:50	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 17:55	3.01	799.01	0.39	0.60	10.08	806.08	0.40	0.62	3.55
10/13/03 18:00	3.01	799.01	0.38	0.60	10.08	806.08	0.40	0.61	3.55
10/13/03 18:05	3.01	799.01	0.38	0.59	10.08	806.08	0.40	0.61	3.54
10/13/03 18:10	3.01	799.01	0.38	0.59	10.08	806.08	0.40	0.61	3.54
10/13/03 18:15	3.01	799.01	0.38	0.59	10.08	806.08	0.40	0.61	3.54
10/13/03 18:20	3.01	799.01	0.38	0.59	10.08	806.08	0.40	0.61	3.54
10/13/03 18:25	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 18:30	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 18:35	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.54
10/13/03 18:40	3.01	799.01	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 18:45	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 18:50	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 18:55	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 19:00	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.61	3.53
10/13/03 19:05	3.00	799.00	0.38	0.59	10.08	806.08	0.39	0.60	3.53
10/13/03 19:10	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.53
10/13/03 19:15	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:20	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:25	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:30	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:35	3.00	799.00	0.38	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:40	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:45	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.52
10/13/03 19:50	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.51
10/13/03 19:55	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.51

10/13/03 20:00	3.00	799.00	0.37	0.58	10.08	806.08	0.39	0.60	3.51
10/13/03 20:05	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.60	3.51
10/13/03 20:10	3.00	799.00	0.37	0.58	10.08	806.08	0.38	0.59	3.51
10/13/03 20:15	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.51
10/13/03 20:20	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.51
10/13/03 20:25	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.51
10/13/03 20:30	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 20:35	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 20:40	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 20:45	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 20:50	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 20:55	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 21:00	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.50
10/13/03 21:05	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 21:10	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.59	3.49
10/13/03 21:15	3.00	799.00	0.37	0.57	10.08	806.08	0.38	0.58	3.49
10/13/03 21:20	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.49
10/13/03 21:25	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.49
10/13/03 21:30	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.49
10/13/03 21:35	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.49
10/13/03 21:40	3.00	799.00	0.36	0.56	10.08	806.08	0.38	0.58	3.48
10/13/03 21:45	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 21:50	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 21:55	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 22:00	3.01	799.01	0.39	0.60	10.08	806.08	0.37	0.58	3.48
10/13/03 22:05	3.00	799.00	0.38	0.59	10.08	806.08	0.37	0.58	3.48
10/13/03 22:10	3.00	799.00	0.37	0.57	10.08	806.08	0.37	0.58	3.48
10/13/03 22:15	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 22:20	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 22:25	3.00	799.00	0.36	0.56	10.08	806.08	0.37	0.58	3.48
10/13/03 22:30	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.58	3.48
10/13/03 22:35	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.58	3.47
10/13/03 22:40	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 22:45	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 22:50	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 22:55	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 23:00	3.00	799.00	0.36	0.55	10.08	806.08	0.37	0.57	3.47
10/13/03 23:05	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 23:10	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 23:15	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 23:20	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 23:25	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 23:30	3.00	799.00	0.35	0.55	10.08	806.08	0.37	0.57	3.46
10/13/03 23:35	3.00	799.00	0.35	0.54	10.08	806.08	0.37	0.57	3.46
10/13/03 23:40	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 23:45	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 23:50	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/13/03 23:55	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45
10/14/03 00:00	3.00	799.00	0.35	0.54	10.08	806.08	0.36	0.56	3.45

	4MR Core Project Alterantive - 25-Year, 24-Hour Design Storm (711 and 733 Mon River Stage)								
	PHL Forebay		PHL Forebay Weir		Panther Hollow Lake		PHL Underflow Pipe		
Maximums	3.3	799.3	144.2	223.1	15.1	811.1	31.5	48.7	9.9
Date/Time	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Velocity (fps)
10/07/03 00:05	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:10	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:15	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:20	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:25	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:30	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:35	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:40	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:45	2.01	798.01	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:50	2.02	798.02	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:55	2.03	798.03	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:00	2.04	798.04	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:05	2.05	798.05	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:10	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:15	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:20	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:25	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:30	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:35	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:40	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:45	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:50	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:55	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:00	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:05	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:10	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:15	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:20	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:25	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:30	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:35	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:40	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:45	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:50	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:55	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:00	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:05	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:10	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:15	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:20	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:25	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:30	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:35	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:40	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:45	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:50	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:55	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:00	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:05	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:10	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:20	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:25	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:30	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:35	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:40	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:45	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:50	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:55	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:00	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:05	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:10	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 05:20	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:25	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:30	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:35	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:40	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:45	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:50	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:55	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:00	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:05	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:10	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:15	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:20	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:25	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:30	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:35	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:40	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:45	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:50	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:55	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:00	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:05	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:10	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:15	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:20	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:25	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:30	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:35	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:40	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:45	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:50	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:55	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:00	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:05	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:10	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:15	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:20	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:25	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:30	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:35	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:40	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:45	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:50	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:55	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:00	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:05	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:10	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:15	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:20	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:25	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:30	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:35	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:40	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:45	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:50	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:55	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:00	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:05	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:10	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:15	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:20	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:25	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:30	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:35	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:40	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:45	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:50	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:55	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 11:00	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:05	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:10	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:15	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:20	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:25	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:30	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:35	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:40	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:45	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:50	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:55	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:00	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:05	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:10	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:15	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:20	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:25	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:30	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:35	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:40	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:45	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:50	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:55	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:00	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:05	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:10	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:15	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:20	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:25	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:30	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:35	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:40	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:45	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:50	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:55	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:00	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:05	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:10	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:15	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:20	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:25	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:30	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:35	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:40	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:45	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:50	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:55	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:00	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:05	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:10	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:15	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:20	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:25	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:30	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:35	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:40	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:45	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:50	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:55	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:00	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:05	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:10	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:15	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:20	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:25	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:30	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:35	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 16:40	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:45	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:50	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:55	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:00	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:05	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:10	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:15	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:20	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:25	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:30	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:35	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:40	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:45	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:50	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:55	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:00	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:05	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:10	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:15	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:20	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:25	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:30	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:35	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:40	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:45	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:50	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:55	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:00	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:05	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:10	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:15	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:20	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:25	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:30	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:35	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:40	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:45	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:50	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:55	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:00	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:05	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:10	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:15	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:20	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:25	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:30	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:35	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:40	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:45	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:50	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:55	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:00	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:05	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:10	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:15	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:20	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:25	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:30	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:35	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:40	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:45	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:50	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:55	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:00	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:05	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:10	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:15	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 22:20	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:25	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:30	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:35	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:40	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:45	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:50	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:55	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:00	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:05	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:10	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:15	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:20	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:25	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:30	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:35	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:40	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:45	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:50	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:55	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:00	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:05	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:10	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:15	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:20	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:25	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:30	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:35	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:40	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:45	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:50	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:55	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:00	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:05	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:10	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:15	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:20	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:25	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:30	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:35	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:40	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:45	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:50	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:55	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:00	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:05	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:10	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:15	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:20	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:25	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:30	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:35	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:40	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:45	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:50	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:55	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:00	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:05	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:10	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:15	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:20	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:25	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:30	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:35	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:40	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:45	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:50	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:55	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 04:00	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:05	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:10	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:15	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:20	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:25	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:30	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:35	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:40	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:45	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:50	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:55	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:00	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:05	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:10	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:15	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:20	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:25	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:30	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:35	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:40	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:45	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:50	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:55	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:00	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:05	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:10	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:15	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:20	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:25	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:30	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:35	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:40	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:45	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:50	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:55	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:00	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:05	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:10	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:15	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:20	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:25	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:30	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:35	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:40	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:45	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:50	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:55	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:00	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:05	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:10	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:15	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:20	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:25	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:30	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:35	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:40	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:45	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:50	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:55	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:00	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:05	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:10	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:15	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:20	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:25	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:30	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:35	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 09:40	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:45	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:50	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:55	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:00	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:05	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:10	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:15	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:20	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:25	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:30	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:35	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:40	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:45	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:50	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:55	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:00	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:05	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:10	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:15	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:20	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:25	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:30	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:35	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:40	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:45	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:50	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:55	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:00	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:05	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:10	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:15	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:20	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:25	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:30	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:35	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:40	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:45	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:50	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:55	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:00	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:05	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:10	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:15	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:20	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:25	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:30	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:35	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:40	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:45	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:50	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:55	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:00	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:05	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:10	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:15	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:20	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:25	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:30	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:35	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:40	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:45	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:50	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:55	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:00	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:05	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:10	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:15	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 15:20	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:25	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:30	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:35	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:40	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:45	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:50	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:55	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:00	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:05	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:10	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:15	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:20	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:25	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:30	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:35	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:40	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:45	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:50	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:55	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:00	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:05	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:10	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:15	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:20	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:25	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:30	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:35	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:40	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:45	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:50	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:55	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:00	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:05	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:10	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:15	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:20	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:25	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:30	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:35	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:40	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:45	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:50	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:55	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:00	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:05	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:10	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:15	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:20	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:25	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:30	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:35	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:40	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:45	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:50	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:55	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:00	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:05	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:10	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:15	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:20	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:25	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:30	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:35	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:40	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:45	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:50	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:55	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 21:00	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:05	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:10	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:15	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:20	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:25	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:30	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:35	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:40	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:45	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:50	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:55	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:00	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:05	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:10	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:15	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:20	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:25	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:30	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:35	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:40	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:45	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:50	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:55	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:00	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:05	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:10	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:15	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:20	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:25	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:30	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:35	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:40	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/08/03 23:45	3.00	799.00	0.05	0.08	10.00	806.00	0.00	0.00	0.00
10/08/03 23:50	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/08/03 23:55	3.00	799.00	0.07	0.11	10.00	806.00	0.00	0.00	0.00
10/09/03 00:00	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:05	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:10	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:15	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:20	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	0.00
10/09/03 00:25	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.00	1.20
10/09/03 00:30	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.25
10/09/03 00:35	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.30
10/09/03 00:40	3.00	799.00	0.08	0.12	10.00	806.00	0.00	0.01	1.35
10/09/03 00:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.39
10/09/03 00:50	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.43
10/09/03 00:55	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.46
10/09/03 01:00	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.49
10/09/03 01:05	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.52
10/09/03 01:10	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.01	1.55
10/09/03 01:15	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.57
10/09/03 01:20	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.59
10/09/03 01:25	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.62
10/09/03 01:30	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.63
10/09/03 01:35	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.65
10/09/03 01:40	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.67
10/09/03 01:45	3.00	799.00	0.08	0.12	10.01	806.01	0.01	0.02	1.68
10/09/03 01:50	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.02	1.70
10/09/03 01:55	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.71
10/09/03 02:00	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.72
10/09/03 02:05	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.73
10/09/03 02:10	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.74
10/09/03 02:15	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.75
10/09/03 02:20	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.76
10/09/03 02:25	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:30	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.03	1.77
10/09/03 02:35	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.78

10/09/03 02:40	3.00	799.00	0.08	0.12	10.01	806.01	0.02	0.04	1.79
10/09/03 02:45	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.79
10/09/03 02:50	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 02:55	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.80
10/09/03 03:00	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:05	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.04	1.81
10/09/03 03:10	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.81
10/09/03 03:15	3.00	799.00	0.08	0.12	10.01	806.01	0.03	0.05	1.80
10/09/03 03:20	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:25	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:30	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:35	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:40	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:45	3.00	799.00	0.08	0.12	10.02	806.02	0.03	0.05	1.80
10/09/03 03:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.05	1.80
10/09/03 03:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:05	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:10	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:15	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:20	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:25	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:30	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:35	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.06	1.81
10/09/03 04:40	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:45	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.83
10/09/03 04:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.84
10/09/03 05:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.85
10/09/03 05:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.85
10/09/03 05:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.86
10/09/03 05:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.87
10/09/03 05:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.89
10/09/03 05:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:40	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:45	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:50	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:55	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.92
10/09/03 06:00	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 06:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 07:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.03
10/09/03 08:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04

10/09/03 08:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:15	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:20	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:25	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:30	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:35	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:40	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:45	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.08
10/09/03 09:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.10
10/09/03 10:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14

10/09/03 14:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.15
10/09/03 17:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16

10/09/03 19:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 21:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16

10/10/03 01:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:25	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.17
10/10/03 01:30	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.17
10/10/03 01:35	3.00	799.00	0.10	0.16	10.03	806.03	0.08	0.12	2.18
10/10/03 01:40	3.00	799.00	0.11	0.17	10.03	806.03	0.08	0.12	2.19
10/10/03 01:45	3.00	799.00	0.12	0.19	10.03	806.03	0.08	0.12	2.20
10/10/03 01:50	3.00	799.00	0.13	0.20	10.03	806.03	0.08	0.13	2.21
10/10/03 01:55	3.00	799.00	0.14	0.21	10.03	806.03	0.08	0.13	2.23
10/10/03 02:00	3.00	799.00	0.14	0.22	10.03	806.03	0.09	0.13	2.25
10/10/03 02:05	3.00	799.00	0.15	0.24	10.03	806.03	0.09	0.13	2.26
10/10/03 02:10	3.00	799.00	0.16	0.25	10.03	806.03	0.09	0.14	2.28
10/10/03 02:15	3.00	799.00	0.17	0.26	10.03	806.03	0.09	0.14	2.30
10/10/03 02:20	3.00	799.00	0.17	0.27	10.03	806.03	0.09	0.15	2.32
10/10/03 02:25	3.00	799.00	0.18	0.27	10.03	806.03	0.10	0.15	2.34
10/10/03 02:30	3.00	799.00	0.18	0.28	10.03	806.03	0.10	0.16	2.36
10/10/03 02:35	3.00	799.00	0.19	0.29	10.03	806.03	0.10	0.16	2.38
10/10/03 02:40	3.00	799.00	0.19	0.30	10.03	806.03	0.11	0.16	2.40
10/10/03 02:45	3.00	799.00	0.20	0.31	10.04	806.04	0.11	0.17	2.42
10/10/03 02:50	3.00	799.00	0.21	0.32	10.04	806.04	0.11	0.17	2.43
10/10/03 02:55	3.00	799.00	0.21	0.33	10.04	806.04	0.12	0.18	2.45
10/10/03 03:00	3.00	799.00	0.22	0.34	10.04	806.04	0.12	0.18	2.47
10/10/03 03:05	3.00	799.00	0.23	0.35	10.04	806.04	0.12	0.19	2.49
10/10/03 03:10	3.00	799.00	0.23	0.36	10.04	806.04	0.13	0.20	2.52
10/10/03 03:15	3.00	799.00	0.24	0.37	10.04	806.04	0.13	0.20	2.54
10/10/03 03:20	3.00	799.00	0.25	0.38	10.04	806.04	0.13	0.21	2.56
10/10/03 03:25	3.00	799.00	0.26	0.40	10.04	806.04	0.14	0.21	2.58
10/10/03 03:30	3.00	799.00	0.26	0.41	10.04	806.04	0.14	0.22	2.61
10/10/03 03:35	3.00	799.00	0.27	0.42	10.04	806.04	0.15	0.23	2.63
10/10/03 03:40	3.00	799.00	0.28	0.43	10.04	806.04	0.15	0.24	2.65
10/10/03 03:45	3.00	799.00	0.29	0.44	10.04	806.04	0.16	0.24	2.68
10/10/03 03:50	3.00	799.00	0.29	0.45	10.05	806.05	0.16	0.25	2.70
10/10/03 03:55	3.00	799.00	0.30	0.46	10.05	806.05	0.17	0.26	2.73
10/10/03 04:00	3.00	799.00	0.31	0.47	10.05	806.05	0.17	0.27	2.75
10/10/03 04:05	3.00	799.00	0.31	0.48	10.05	806.05	0.18	0.27	2.78
10/10/03 04:10	3.00	799.00	0.32	0.49	10.05	806.05	0.18	0.28	2.81
10/10/03 04:15	3.00	799.00	0.32	0.50	10.05	806.05	0.19	0.29	2.83
10/10/03 04:20	3.00	799.00	0.33	0.51	10.05	806.05	0.19	0.30	2.86
10/10/03 04:25	3.00	799.00	0.34	0.52	10.05	806.05	0.20	0.31	2.88
10/10/03 04:30	3.00	799.00	0.34	0.53	10.05	806.05	0.20	0.32	2.91
10/10/03 04:35	3.00	799.00	0.35	0.54	10.05	806.05	0.21	0.33	2.94
10/10/03 04:40	3.00	799.00	0.36	0.55	10.06	806.06	0.22	0.33	2.96
10/10/03 04:45	3.00	799.00	0.36	0.56	10.06	806.06	0.22	0.34	2.99
10/10/03 04:50	3.00	799.00	0.37	0.57	10.06	806.06	0.23	0.35	3.01
10/10/03 04:55	3.00	799.00	0.38	0.59	10.06	806.06	0.23	0.36	3.04
10/10/03 05:00	3.01	799.01	0.39	0.60	10.06	806.06	0.24	0.37	3.07
10/10/03 05:05	3.01	799.01	0.40	0.61	10.06	806.06	0.25	0.38	3.09
10/10/03 05:10	3.01	799.01	0.40	0.63	10.06	806.06	0.25	0.39	3.11
10/10/03 05:15	3.01	799.01	0.41	0.64	10.06	806.06	0.26	0.40	3.13
10/10/03 05:20	3.01	799.01	0.42	0.65	10.06	806.06	0.27	0.41	3.15
10/10/03 05:25	3.01	799.01	0.43	0.67	10.06	806.06	0.27	0.42	3.18
10/10/03 05:30	3.01	799.01	0.44	0.68	10.07	806.07	0.28	0.44	3.20
10/10/03 05:35	3.01	799.01	0.45	0.69	10.07	806.07	0.29	0.45	3.22
10/10/03 05:40	3.01	799.01	0.46	0.71	10.07	806.07	0.30	0.46	3.25
10/10/03 05:45	3.01	799.01	0.46	0.72	10.07	806.07	0.30	0.47	3.27
10/10/03 05:50	3.01	799.01	0.47	0.73	10.07	806.07	0.31	0.48	3.29
10/10/03 05:55	3.01	799.01	0.48	0.74	10.07	806.07	0.32	0.49	3.32
10/10/03 06:00	3.01	799.01	0.49	0.75	10.07	806.07	0.33	0.51	3.34
10/10/03 06:05	3.01	799.01	0.49	0.76	10.07	806.07	0.33	0.52	3.36
10/10/03 06:10	3.01	799.01	0.50	0.77	10.07	806.07	0.34	0.53	3.39
10/10/03 06:15	3.01	799.01	0.51	0.78	10.08	806.08	0.35	0.54	3.41
10/10/03 06:20	3.01	799.01	0.51	0.79	10.08	806.08	0.36	0.55	3.43
10/10/03 06:25	3.01	799.01	0.52	0.81	10.08	806.08	0.37	0.57	3.46
10/10/03 06:30	3.01	799.01	0.53	0.82	10.08	806.08	0.37	0.58	3.48
10/10/03 06:35	3.01	799.01	0.54	0.83	10.08	806.08	0.38	0.59	3.50
10/10/03 06:40	3.01	799.01	0.54	0.84	10.08	806.08	0.39	0.60	3.53
10/10/03 06:45	3.01	799.01	0.55	0.86	10.08	806.08	0.40	0.62	3.55
10/10/03 06:50	3.01	799.01	0.53	0.82	10.08	806.08	0.41	0.63	3.57
10/10/03 06:55	3.01	799.01	0.56	0.86	10.08	806.08	0.41	0.64	3.59

10/10/03 07:00	3.01	799.01	0.58	0.90	10.09	806.09	0.42	0.65	3.61
10/10/03 07:05	3.01	799.01	0.60	0.93	10.09	806.09	0.43	0.67	3.64
10/10/03 07:10	3.01	799.01	0.61	0.95	10.09	806.09	0.44	0.68	3.66
10/10/03 07:15	3.01	799.01	0.63	0.97	10.09	806.09	0.45	0.70	3.68
10/10/03 07:20	3.01	799.01	0.64	0.99	10.09	806.09	0.46	0.71	3.70
10/10/03 07:25	3.01	799.01	0.66	1.02	10.09	806.09	0.47	0.73	3.72
10/10/03 07:30	3.01	799.01	0.67	1.04	10.09	806.09	0.48	0.74	3.74
10/10/03 07:35	3.01	799.01	0.69	1.07	10.09	806.09	0.49	0.76	3.77
10/10/03 07:40	3.01	799.01	0.71	1.10	10.10	806.10	0.50	0.78	3.79
10/10/03 07:45	3.01	799.01	0.73	1.12	10.10	806.10	0.51	0.79	3.82
10/10/03 07:50	3.01	799.01	0.75	1.15	10.10	806.10	0.52	0.81	3.85
10/10/03 07:55	3.01	799.01	0.76	1.18	10.10	806.10	0.54	0.83	3.88
10/10/03 08:00	3.01	799.01	0.78	1.21	10.10	806.10	0.55	0.85	3.90
10/10/03 08:05	3.01	799.01	0.80	1.24	10.10	806.10	0.56	0.87	3.93
10/10/03 08:10	3.01	799.01	0.82	1.27	10.11	806.11	0.58	0.89	3.96
10/10/03 08:15	3.01	799.01	0.84	1.30	10.11	806.11	0.59	0.91	3.99
10/10/03 08:20	3.01	799.01	0.86	1.33	10.11	806.11	0.60	0.94	4.02
10/10/03 08:25	3.01	799.01	0.88	1.35	10.11	806.11	0.62	0.96	4.05
10/10/03 08:30	3.01	799.01	0.89	1.38	10.11	806.11	0.63	0.98	4.08
10/10/03 08:35	3.01	799.01	0.91	1.41	10.11	806.11	0.65	1.01	4.11
10/10/03 08:40	3.01	799.01	0.93	1.44	10.12	806.12	0.67	1.03	4.14
10/10/03 08:45	3.01	799.01	0.95	1.47	10.12	806.12	0.68	1.06	4.17
10/10/03 08:50	3.01	799.01	0.97	1.50	10.12	806.12	0.70	1.08	4.20
10/10/03 08:55	3.01	799.01	0.99	1.52	10.12	806.12	0.72	1.11	4.22
10/10/03 09:00	3.01	799.01	1.00	1.55	10.12	806.12	0.73	1.13	4.25
10/10/03 09:05	3.01	799.01	1.02	1.58	10.13	806.13	0.75	1.16	4.27
10/10/03 09:10	3.01	799.01	1.04	1.61	10.13	806.13	0.77	1.19	4.30
10/10/03 09:15	3.01	799.01	1.06	1.63	10.13	806.13	0.79	1.22	4.32
10/10/03 09:20	3.01	799.01	1.07	1.66	10.13	806.13	0.80	1.24	4.35
10/10/03 09:25	3.01	799.01	1.09	1.68	10.13	806.13	0.82	1.27	4.37
10/10/03 09:30	3.01	799.01	1.10	1.71	10.14	806.14	0.84	1.30	4.40
10/10/03 09:35	3.01	799.01	1.12	1.74	10.14	806.14	0.86	1.33	4.42
10/10/03 09:40	3.01	799.01	1.14	1.77	10.14	806.14	0.88	1.36	4.45
10/10/03 09:45	3.01	799.01	1.16	1.80	10.14	806.14	0.89	1.38	4.48
10/10/03 09:50	3.01	799.01	1.19	1.84	10.14	806.14	0.91	1.41	4.50
10/10/03 09:55	3.01	799.01	1.22	1.88	10.15	806.15	0.93	1.44	4.53
10/10/03 10:00	3.01	799.01	1.25	1.93	10.15	806.15	0.95	1.48	4.57
10/10/03 10:05	3.01	799.01	1.28	1.98	10.15	806.15	0.98	1.51	4.60
10/10/03 10:10	3.01	799.01	1.30	2.01	10.15	806.15	1.00	1.54	4.63
10/10/03 10:15	3.01	799.01	1.32	2.05	10.15	806.15	1.02	1.58	4.66
10/10/03 10:20	3.01	799.01	1.38	2.14	10.16	806.16	1.04	1.62	4.69
10/10/03 10:25	3.01	799.01	1.43	2.21	10.16	806.16	1.07	1.66	4.72
10/10/03 10:30	3.01	799.01	1.47	2.28	10.16	806.16	1.10	1.70	4.75
10/10/03 10:35	3.01	799.01	1.54	2.38	10.17	806.17	1.13	1.74	4.79
10/10/03 10:40	3.01	799.01	1.59	2.47	10.17	806.17	1.16	1.79	4.83
10/10/03 10:45	3.01	799.01	1.64	2.54	10.17	806.17	1.19	1.85	4.86
10/10/03 10:50	3.01	799.01	1.71	2.64	10.18	806.18	1.23	1.90	4.90
10/10/03 10:55	3.01	799.01	1.77	2.74	10.18	806.18	1.27	1.96	4.94
10/10/03 11:00	3.01	799.01	1.84	2.85	10.18	806.18	1.31	2.03	4.98
10/10/03 11:05	3.01	799.01	1.95	3.01	10.19	806.19	1.35	2.09	5.04
10/10/03 11:10	3.02	799.02	2.04	3.16	10.19	806.19	1.40	2.17	5.09
10/10/03 11:15	3.02	799.02	2.14	3.31	10.20	806.20	1.46	2.25	5.14
10/10/03 11:20	3.02	799.02	2.28	3.53	10.20	806.20	1.52	2.35	5.20
10/10/03 11:25	3.02	799.02	2.45	3.79	10.21	806.21	1.58	2.45	5.26
10/10/03 11:30	3.02	799.02	2.57	3.98	10.21	806.21	1.66	2.57	5.32
10/10/03 11:35	3.02	799.02	3.79	5.87	10.23	806.23	1.79	2.76	5.43
10/10/03 11:40	3.03	799.03	5.18	8.02	10.25	806.25	2.02	3.12	5.61
10/10/03 11:45	3.04	799.04	7.35	11.37	10.28	806.28	2.35	3.64	5.84
10/10/03 11:50	3.06	799.06	17.79	27.53	10.34	806.34	3.09	4.78	6.25
10/10/03 11:55	3.10	799.10	32.28	49.95	10.48	806.48	5.08	7.86	7.07
10/10/03 12:00	3.16	799.16	70.34	108.83	10.71	806.71	8.97	13.87	8.04
10/10/03 12:05	3.21	799.21	106.77	165.20	11.16	807.16	17.26	26.70	9.23
10/10/03 12:10	3.26	799.26	139.66	216.08	11.69	807.69	21.06	32.58	9.49
10/10/03 12:15	3.26	799.26	144.18	223.07	12.29	808.29	24.56	38.00	8.60
10/10/03 12:20	3.25	799.25	132.84	205.53	12.79	808.79	27.25	42.16	8.59
10/10/03 12:25	3.23	799.23	121.81	188.46	13.20	809.20	29.40	45.49	9.27
10/10/03 12:30	3.22	799.22	112.39	173.89	13.56	809.56	30.05	46.49	9.47
10/10/03 12:35	3.20	799.20	98.84	152.93	13.85	809.85	30.33	46.93	9.56

10/10/03 12:40	3.19	799.19	90.61	140.19	14.10	810.10	30.56	47.29	9.63
10/10/03 12:45	3.18	799.18	83.79	129.64	14.31	810.31	30.76	47.59	9.70
10/10/03 12:50	3.17	799.17	76.13	117.79	14.49	810.49	30.93	47.85	9.75
10/10/03 12:55	3.16	799.16	68.24	105.58	14.64	810.64	31.07	48.07	9.79
10/10/03 13:00	3.15	799.15	60.66	93.85	14.76	810.76	31.18	48.24	9.83
10/10/03 13:05	3.14	799.14	54.18	83.83	14.86	810.86	31.27	48.38	9.86
10/10/03 13:10	3.13	799.13	49.61	76.76	14.93	810.93	31.34	48.49	9.88
10/10/03 13:15	3.12	799.12	44.51	68.87	14.99	810.99	31.39	48.57	9.89
10/10/03 13:20	3.11	799.11	40.47	62.61	15.03	811.03	31.43	48.63	9.91
10/10/03 13:25	3.11	799.11	37.53	58.06	15.07	811.07	31.46	48.68	9.92
10/10/03 13:30	3.10	799.10	35.02	54.18	15.09	811.09	31.48	48.71	9.92
10/10/03 13:35	3.10	799.10	32.81	50.76	15.10	811.10	31.49	48.73	9.93
10/10/03 13:40	3.09	799.09	30.51	47.21	15.11	811.11	31.50	48.74	9.93
10/10/03 13:45	3.09	799.09	28.63	44.29	15.11	811.11	31.50	48.74	9.93
10/10/03 13:50	3.09	799.09	26.99	41.76	15.10	811.10	31.49	48.73	9.93
10/10/03 13:55	3.08	799.08	25.53	39.50	15.09	811.09	31.48	48.71	9.92
10/10/03 14:00	3.08	799.08	24.26	37.54	15.07	811.07	31.47	48.69	9.92
10/10/03 14:05	3.08	799.08	23.18	35.87	15.05	811.05	31.45	48.66	9.91
10/10/03 14:10	3.08	799.08	22.21	34.36	15.03	811.03	31.43	48.63	9.91
10/10/03 14:15	3.07	799.07	21.22	32.83	15.00	811.00	31.40	48.59	9.90
10/10/03 14:20	3.07	799.07	20.40	31.56	14.97	810.97	31.38	48.55	9.89
10/10/03 14:25	3.07	799.07	19.57	30.28	14.94	810.94	31.35	48.50	9.88
10/10/03 14:30	3.07	799.07	18.88	29.21	14.90	810.90	31.31	48.45	9.87
10/10/03 14:35	3.07	799.07	18.15	28.08	14.87	810.87	31.28	48.40	9.86
10/10/03 14:40	3.06	799.06	17.47	27.03	14.82	810.82	31.24	48.34	9.85
10/10/03 14:45	3.06	799.06	16.90	26.15	14.78	810.78	31.20	48.28	9.84
10/10/03 14:50	3.06	799.06	16.39	25.36	14.74	810.74	31.16	48.22	9.82
10/10/03 14:55	3.06	799.06	15.55	24.07	14.69	810.69	31.12	48.15	9.81
10/10/03 15:00	3.06	799.06	14.53	22.47	14.64	810.64	31.07	48.08	9.79
10/10/03 15:05	3.05	799.05	13.88	21.47	14.59	810.59	31.02	48.00	9.78
10/10/03 15:10	3.05	799.05	13.49	20.86	14.53	810.53	30.97	47.92	9.76
10/10/03 15:15	3.05	799.05	13.05	20.20	14.47	810.47	30.92	47.84	9.75
10/10/03 15:20	3.05	799.05	12.08	18.70	14.41	810.41	30.86	47.75	9.73
10/10/03 15:25	3.05	799.05	11.65	18.02	14.35	810.35	30.81	47.66	9.71
10/10/03 15:30	3.05	799.05	11.30	17.48	14.28	810.28	30.75	47.57	9.69
10/10/03 15:35	3.05	799.05	10.94	16.93	14.22	810.22	30.68	47.47	9.67
10/10/03 15:40	3.05	799.05	10.58	16.36	14.15	810.15	30.62	47.38	9.65
10/10/03 15:45	3.04	799.04	10.23	15.82	14.08	810.08	30.56	47.28	9.63
10/10/03 15:50	3.04	799.04	9.90	15.31	14.01	810.01	30.49	47.17	9.61
10/10/03 15:55	3.04	799.04	9.60	14.86	13.94	809.94	30.42	47.07	9.59
10/10/03 16:00	3.04	799.04	9.34	14.45	13.86	809.86	30.35	46.96	9.57
10/10/03 16:05	3.04	799.04	9.10	14.07	13.79	809.79	30.28	46.85	9.54
10/10/03 16:10	3.04	799.04	8.84	13.68	13.71	809.71	30.21	46.74	9.52
10/10/03 16:15	3.04	799.04	8.59	13.28	13.63	809.63	30.14	46.63	9.50
10/10/03 16:20	3.04	799.04	8.32	12.88	13.55	809.55	30.06	46.51	9.48
10/10/03 16:25	3.04	799.04	8.06	12.47	13.47	809.47	29.99	46.39	9.45
10/10/03 16:30	3.04	799.04	7.81	12.08	13.39	809.39	29.91	46.27	9.43
10/10/03 16:35	3.04	799.04	7.59	11.74	13.31	809.31	29.83	46.15	9.40
10/10/03 16:40	3.04	799.04	7.39	11.44	13.22	809.22	29.75	46.02	9.38
10/10/03 16:45	3.04	799.04	7.22	11.16	13.14	809.14	29.37	45.45	9.26
10/10/03 16:50	3.03	799.03	7.04	10.90	13.06	809.06	28.98	44.83	9.13
10/10/03 16:55	3.03	799.03	6.88	10.65	12.97	808.97	28.57	44.21	9.01
10/10/03 17:00	3.03	799.03	6.72	10.40	12.89	808.89	28.16	43.57	8.88
10/10/03 17:05	3.03	799.03	6.56	10.14	12.80	808.80	27.75	42.93	8.75
10/10/03 17:10	3.03	799.03	6.40	9.90	12.72	808.72	27.32	42.27	8.61
10/10/03 17:15	3.03	799.03	6.35	9.82	12.63	808.63	26.90	41.61	8.48
10/10/03 17:20	3.03	799.03	6.12	9.46	12.55	808.55	26.47	40.95	8.34
10/10/03 17:25	3.03	799.03	5.98	9.26	12.46	808.46	26.05	40.30	8.21
10/10/03 17:30	3.03	799.03	5.86	9.07	12.38	808.38	25.93	40.12	8.21
10/10/03 17:35	3.03	799.03	5.74	8.89	12.29	808.29	25.12	38.87	8.36
10/10/03 17:40	3.03	799.03	5.62	8.70	12.21	808.21	24.65	38.14	8.43
10/10/03 17:45	3.03	799.03	5.52	8.54	12.12	808.12	24.18	37.40	8.52
10/10/03 17:50	3.03	799.03	5.43	8.41	12.04	808.04	23.77	36.77	8.66
10/10/03 17:55	3.03	799.03	5.36	8.29	11.95	807.95	23.21	35.91	8.90
10/10/03 18:00	3.03	799.03	5.28	8.17	11.87	807.87	22.71	35.14	9.04
10/10/03 18:05	3.03	799.03	5.18	8.02	11.79	807.79	22.21	34.37	9.15
10/10/03 18:10	3.03	799.03	5.08	7.86	11.71	807.71	21.71	33.60	9.25
10/10/03 18:15	3.03	799.03	4.98	7.71	11.63	807.63	21.21	32.82	9.35

10/10/03 18:20	3.03	799.03	4.89	7.57	11.56	807.56	20.71	32.04	9.45
10/10/03 18:25	3.03	799.03	4.79	7.41	11.48	807.48	20.23	31.29	9.53
10/10/03 18:30	3.03	799.03	4.69	7.25	11.41	807.41	19.73	30.52	9.49
10/10/03 18:35	3.03	799.03	4.58	7.09	11.34	807.34	19.22	29.73	9.45
10/10/03 18:40	3.03	799.03	4.49	6.94	11.27	807.27	18.70	28.94	9.41
10/10/03 18:45	3.03	799.03	4.40	6.80	11.20	807.20	18.19	28.14	9.36
10/10/03 18:50	3.03	799.03	4.31	6.67	11.13	807.13	17.67	27.35	9.31
10/10/03 18:55	3.02	799.02	4.22	6.53	11.06	807.06	17.16	26.55	9.26
10/10/03 19:00	3.02	799.02	4.14	6.40	11.00	807.00	16.64	25.74	9.21
10/10/03 19:05	3.02	799.02	4.05	6.27	10.94	806.94	15.60	24.14	9.11
10/10/03 19:10	3.02	799.02	3.97	6.15	10.89	806.89	14.26	22.06	8.95
10/10/03 19:15	3.02	799.02	3.90	6.03	10.84	806.84	13.09	20.25	8.80
10/10/03 19:20	3.02	799.02	3.83	5.92	10.79	806.79	12.06	18.67	8.66
10/10/03 19:25	3.02	799.02	3.76	5.81	10.75	806.75	11.17	17.28	8.52
10/10/03 19:30	3.02	799.02	3.69	5.71	10.72	806.72	10.38	16.06	8.38
10/10/03 19:35	3.02	799.02	3.62	5.60	10.69	806.69	9.68	14.98	8.26
10/10/03 19:40	3.02	799.02	3.56	5.51	10.66	806.66	9.06	14.02	8.14
10/10/03 19:45	3.02	799.02	3.51	5.43	10.63	806.63	8.51	13.17	8.03
10/10/03 19:50	3.02	799.02	3.46	5.36	10.61	806.61	8.02	12.41	7.92
10/10/03 19:55	3.02	799.02	3.42	5.29	10.58	806.58	7.58	11.72	7.82
10/10/03 20:00	3.02	799.02	3.36	5.19	10.56	806.56	7.18	11.11	7.72
10/10/03 20:05	3.02	799.02	3.28	5.07	10.54	806.54	6.82	10.55	7.63
10/10/03 20:10	3.02	799.02	3.19	4.94	10.53	806.53	6.49	10.05	7.54
10/10/03 20:15	3.02	799.02	3.12	4.82	10.51	806.51	6.19	9.58	7.46
10/10/03 20:20	3.02	799.02	3.07	4.75	10.49	806.49	5.91	9.15	7.38
10/10/03 20:25	3.02	799.02	2.99	4.62	10.48	806.48	5.66	8.76	7.30
10/10/03 20:30	3.02	799.02	2.93	4.53	10.47	806.47	5.43	8.40	7.23
10/10/03 20:35	3.02	799.02	2.88	4.45	10.45	806.45	5.21	8.06	7.16
10/10/03 20:40	3.02	799.02	2.82	4.37	10.44	806.44	5.01	7.75	7.09
10/10/03 20:45	3.02	799.02	2.77	4.29	10.43	806.43	4.83	7.47	7.02
10/10/03 20:50	3.02	799.02	2.73	4.22	10.42	806.42	4.66	7.20	6.96
10/10/03 20:55	3.02	799.02	2.68	4.15	10.41	806.41	4.50	6.96	6.91
10/10/03 21:00	3.02	799.02	2.64	4.08	10.40	806.40	4.35	6.73	6.85
10/10/03 21:05	3.02	799.02	2.59	4.01	10.39	806.39	4.21	6.51	6.79
10/10/03 21:10	3.02	799.02	2.55	3.95	10.39	806.39	4.08	6.31	6.74
10/10/03 21:15	3.02	799.02	2.51	3.89	10.38	806.38	3.96	6.13	6.69
10/10/03 21:20	3.02	799.02	2.48	3.83	10.37	806.37	3.85	5.95	6.64
10/10/03 21:25	3.02	799.02	2.44	3.77	10.37	806.37	3.74	5.79	6.60
10/10/03 21:30	3.02	799.02	2.41	3.72	10.36	806.36	3.64	5.63	6.55
10/10/03 21:35	3.02	799.02	2.37	3.67	10.35	806.35	3.55	5.49	6.50
10/10/03 21:40	3.02	799.02	2.34	3.62	10.35	806.35	3.46	5.35	6.46
10/10/03 21:45	3.02	799.02	2.31	3.58	10.34	806.34	3.37	5.22	6.42
10/10/03 21:50	3.02	799.02	2.28	3.53	10.34	806.34	3.29	5.10	6.39
10/10/03 21:55	3.02	799.02	2.26	3.49	10.33	806.33	3.22	4.98	6.35
10/10/03 22:00	3.02	799.02	2.23	3.45	10.33	806.33	3.15	4.87	6.31
10/10/03 22:05	3.02	799.02	2.20	3.41	10.32	806.32	3.08	4.77	6.28
10/10/03 22:10	3.02	799.02	2.18	3.37	10.32	806.32	3.02	4.67	6.24
10/10/03 22:15	3.02	799.02	2.15	3.33	10.31	806.31	2.96	4.58	6.21
10/10/03 22:20	3.02	799.02	2.13	3.29	10.31	806.31	2.90	4.49	6.18
10/10/03 22:25	3.02	799.02	2.10	3.26	10.30	806.30	2.84	4.40	6.15
10/10/03 22:30	3.02	799.02	2.08	3.22	10.30	806.30	2.79	4.32	6.12
10/10/03 22:35	3.02	799.02	2.06	3.19	10.30	806.30	2.74	4.24	6.09
10/10/03 22:40	3.02	799.02	2.04	3.16	10.29	806.29	2.69	4.17	6.07
10/10/03 22:45	3.02	799.02	2.02	3.13	10.29	806.29	2.65	4.10	6.04
10/10/03 22:50	3.02	799.02	2.01	3.11	10.29	806.29	2.61	4.03	6.01
10/10/03 22:55	3.02	799.02	2.00	3.09	10.28	806.28	2.57	3.97	5.99
10/10/03 23:00	3.02	799.02	1.98	3.06	10.28	806.28	2.53	3.91	5.96
10/10/03 23:05	3.01	799.01	1.96	3.03	10.28	806.28	2.49	3.85	5.94
10/10/03 23:10	3.01	799.01	1.94	3.00	10.28	806.28	2.45	3.80	5.91
10/10/03 23:15	3.01	799.01	1.92	2.97	10.27	806.27	2.42	3.74	5.89
10/10/03 23:20	3.01	799.01	1.90	2.94	10.27	806.27	2.38	3.69	5.87
10/10/03 23:25	3.01	799.01	1.88	2.91	10.27	806.27	2.35	3.64	5.85
10/10/03 23:30	3.01	799.01	1.87	2.89	10.27	806.27	2.32	3.59	5.83
10/10/03 23:35	3.01	799.01	1.86	2.87	10.26	806.26	2.29	3.55	5.81
10/10/03 23:40	3.01	799.01	1.85	2.85	10.26	806.26	2.26	3.50	5.79
10/10/03 23:45	3.01	799.01	1.83	2.84	10.26	806.26	2.24	3.46	5.77
10/10/03 23:50	3.01	799.01	1.82	2.82	10.26	806.26	2.21	3.42	5.76
10/10/03 23:55	3.01	799.01	1.81	2.81	10.26	806.26	2.19	3.38	5.74

10/11/03 00:00	3.01	799.01	1.81	2.79	10.25	806.25	2.16	3.34	5.72
10/11/03 00:05	3.01	799.01	1.77	2.73	10.25	806.25	2.14	3.31	5.70
10/11/03 00:10	3.01	799.01	1.73	2.67	10.25	806.25	2.11	3.27	5.69
10/11/03 00:15	3.01	799.01	1.70	2.63	10.25	806.25	2.09	3.23	5.67
10/11/03 00:20	3.01	799.01	1.67	2.58	10.25	806.25	2.06	3.19	5.65
10/11/03 00:25	3.01	799.01	1.64	2.54	10.24	806.24	2.03	3.14	5.63
10/11/03 00:30	3.01	799.01	1.62	2.50	10.24	806.24	2.01	3.10	5.61
10/11/03 00:35	3.01	799.01	1.59	2.47	10.24	806.24	1.98	3.06	5.59
10/11/03 00:40	3.01	799.01	1.57	2.44	10.24	806.24	1.95	3.02	5.57
10/11/03 00:45	3.01	799.01	1.56	2.41	10.24	806.24	1.93	2.98	5.55
10/11/03 00:50	3.01	799.01	1.54	2.39	10.23	806.23	1.90	2.95	5.53
10/11/03 00:55	3.01	799.01	1.53	2.37	10.23	806.23	1.88	2.91	5.51
10/11/03 01:00	3.01	799.01	1.52	2.35	10.23	806.23	1.86	2.87	5.49
10/11/03 01:05	3.01	799.01	1.50	2.33	10.23	806.23	1.83	2.84	5.47
10/11/03 01:10	3.01	799.01	1.49	2.31	10.23	806.23	1.81	2.80	5.45
10/11/03 01:15	3.01	799.01	1.48	2.28	10.22	806.22	1.79	2.77	5.44
10/11/03 01:20	3.01	799.01	1.46	2.26	10.22	806.22	1.77	2.74	5.42
10/11/03 01:25	3.01	799.01	1.45	2.24	10.22	806.22	1.75	2.71	5.40
10/11/03 01:30	3.01	799.01	1.43	2.21	10.22	806.22	1.73	2.68	5.39
10/11/03 01:35	3.01	799.01	1.42	2.19	10.22	806.22	1.71	2.65	5.37
10/11/03 01:40	3.01	799.01	1.40	2.17	10.22	806.22	1.69	2.62	5.36
10/11/03 01:45	3.01	799.01	1.39	2.15	10.21	806.21	1.67	2.59	5.34
10/11/03 01:50	3.01	799.01	1.38	2.13	10.21	806.21	1.66	2.56	5.32
10/11/03 01:55	3.01	799.01	1.36	2.11	10.21	806.21	1.64	2.54	5.31
10/11/03 02:00	3.01	799.01	1.35	2.09	10.21	806.21	1.62	2.51	5.29
10/11/03 02:05	3.01	799.01	1.34	2.08	10.21	806.21	1.60	2.48	5.28
10/11/03 02:10	3.01	799.01	1.33	2.06	10.21	806.21	1.59	2.46	5.26
10/11/03 02:15	3.01	799.01	1.32	2.04	10.21	806.21	1.57	2.43	5.25
10/11/03 02:20	3.01	799.01	1.31	2.03	10.20	806.20	1.56	2.41	5.24
10/11/03 02:25	3.01	799.01	1.30	2.02	10.20	806.20	1.54	2.38	5.22
10/11/03 02:30	3.01	799.01	1.30	2.01	10.20	806.20	1.53	2.36	5.21
10/11/03 02:35	3.01	799.01	1.29	2.00	10.20	806.20	1.51	2.34	5.19
10/11/03 02:40	3.01	799.01	1.28	1.99	10.20	806.20	1.50	2.32	5.18
10/11/03 02:45	3.01	799.01	1.28	1.98	10.20	806.20	1.49	2.30	5.17
10/11/03 02:50	3.01	799.01	1.27	1.97	10.20	806.20	1.47	2.28	5.16
10/11/03 02:55	3.01	799.01	1.27	1.97	10.20	806.20	1.46	2.26	5.15
10/11/03 03:00	3.01	799.01	1.27	1.96	10.19	806.19	1.45	2.24	5.13
10/11/03 03:05	3.01	799.01	1.26	1.95	10.19	806.19	1.44	2.23	5.12
10/11/03 03:10	3.01	799.01	1.26	1.95	10.19	806.19	1.43	2.21	5.11
10/11/03 03:15	3.01	799.01	1.26	1.94	10.19	806.19	1.42	2.19	5.10
10/11/03 03:20	3.01	799.01	1.25	1.94	10.19	806.19	1.41	2.18	5.09
10/11/03 03:25	3.01	799.01	1.25	1.93	10.19	806.19	1.40	2.16	5.08
10/11/03 03:30	3.01	799.01	1.25	1.93	10.19	806.19	1.39	2.15	5.07
10/11/03 03:35	3.01	799.01	1.25	1.93	10.19	806.19	1.38	2.14	5.07
10/11/03 03:40	3.01	799.01	1.24	1.92	10.19	806.19	1.37	2.12	5.06
10/11/03 03:45	3.01	799.01	1.24	1.92	10.19	806.19	1.37	2.11	5.05
10/11/03 03:50	3.01	799.01	1.24	1.92	10.19	806.19	1.36	2.10	5.04
10/11/03 03:55	3.01	799.01	1.24	1.92	10.19	806.19	1.35	2.09	5.03
10/11/03 04:00	3.01	799.01	1.24	1.91	10.19	806.19	1.34	2.08	5.03
10/11/03 04:05	3.01	799.01	1.24	1.91	10.18	806.18	1.34	2.07	5.02
10/11/03 04:10	3.01	799.01	1.24	1.91	10.18	806.18	1.33	2.06	5.01
10/11/03 04:15	3.01	799.01	1.23	1.91	10.18	806.18	1.33	2.05	5.00
10/11/03 04:20	3.01	799.01	1.23	1.91	10.18	806.18	1.32	2.04	5.00
10/11/03 04:25	3.01	799.01	1.23	1.91	10.18	806.18	1.32	2.04	4.99
10/11/03 04:30	3.01	799.01	1.23	1.91	10.18	806.18	1.31	2.03	4.99
10/11/03 04:35	3.01	799.01	1.23	1.90	10.18	806.18	1.31	2.02	4.98
10/11/03 04:40	3.01	799.01	1.23	1.90	10.18	806.18	1.30	2.01	4.98
10/11/03 04:45	3.01	799.01	1.23	1.90	10.18	806.18	1.30	2.01	4.97
10/11/03 04:50	3.01	799.01	1.23	1.90	10.18	806.18	1.29	2.00	4.97
10/11/03 04:55	3.01	799.01	1.23	1.90	10.18	806.18	1.29	2.00	4.96
10/11/03 05:00	3.01	799.01	1.23	1.90	10.18	806.18	1.29	1.99	4.96
10/11/03 05:05	3.01	799.01	1.23	1.90	10.18	806.18	1.28	1.98	4.96
10/11/03 05:10	3.01	799.01	1.23	1.90	10.18	806.18	1.28	1.98	4.95
10/11/03 05:15	3.01	799.01	1.22	1.89	10.18	806.18	1.28	1.97	4.95
10/11/03 05:20	3.01	799.01	1.22	1.89	10.18	806.18	1.27	1.97	4.95
10/11/03 05:25	3.01	799.01	1.22	1.89	10.18	806.18	1.27	1.97	4.94
10/11/03 05:30	3.01	799.01	1.22	1.89	10.18	806.18	1.27	1.96	4.94
10/11/03 05:35	3.01	799.01	1.22	1.89	10.18	806.18	1.27	1.96	4.94

10/11/03 05:40	3.01	799.01	1.22	1.89	10.18	806.18	1.26	1.95	4.94
10/11/03 05:45	3.01	799.01	1.22	1.89	10.18	806.18	1.26	1.95	4.93
10/11/03 05:50	3.01	799.01	1.22	1.89	10.18	806.18	1.26	1.95	4.93
10/11/03 05:55	3.01	799.01	1.22	1.88	10.18	806.18	1.26	1.94	4.93
10/11/03 06:00	3.01	799.01	1.22	1.88	10.18	806.18	1.25	1.94	4.93
10/11/03 06:05	3.01	799.01	1.22	1.88	10.18	806.18	1.25	1.94	4.92
10/11/03 06:10	3.01	799.01	1.21	1.88	10.18	806.18	1.25	1.93	4.92
10/11/03 06:15	3.01	799.01	1.21	1.88	10.18	806.18	1.25	1.93	4.92
10/11/03 06:20	3.01	799.01	1.21	1.88	10.18	806.18	1.25	1.93	4.92
10/11/03 06:25	3.01	799.01	1.21	1.87	10.18	806.18	1.24	1.92	4.92
10/11/03 06:30	3.01	799.01	1.21	1.87	10.18	806.18	1.24	1.92	4.91
10/11/03 06:35	3.01	799.01	1.21	1.87	10.18	806.18	1.24	1.92	4.91
10/11/03 06:40	3.01	799.01	1.21	1.87	10.18	806.18	1.24	1.92	4.91
10/11/03 06:45	3.01	799.01	1.21	1.87	10.18	806.18	1.24	1.91	4.91
10/11/03 06:50	3.01	799.01	1.21	1.87	10.17	806.17	1.23	1.91	4.91
10/11/03 06:55	3.01	799.01	1.21	1.86	10.17	806.17	1.23	1.91	4.91
10/11/03 07:00	3.01	799.01	1.20	1.86	10.17	806.17	1.23	1.91	4.90
10/11/03 07:05	3.01	799.01	1.20	1.86	10.17	806.17	1.23	1.90	4.90
10/11/03 07:10	3.01	799.01	1.20	1.86	10.17	806.17	1.23	1.90	4.90
10/11/03 07:15	3.01	799.01	1.20	1.86	10.17	806.17	1.23	1.90	4.90
10/11/03 07:20	3.01	799.01	1.20	1.86	10.17	806.17	1.23	1.90	4.90
10/11/03 07:25	3.01	799.01	1.21	1.87	10.17	806.17	1.22	1.89	4.90
10/11/03 07:30	3.01	799.01	1.20	1.85	10.17	806.17	1.22	1.89	4.89
10/11/03 07:35	3.01	799.01	1.20	1.85	10.17	806.17	1.22	1.89	4.89
10/11/03 07:40	3.01	799.01	1.19	1.85	10.17	806.17	1.22	1.89	4.89
10/11/03 07:45	3.01	799.01	1.19	1.85	10.17	806.17	1.22	1.88	4.89
10/11/03 07:50	3.01	799.01	1.19	1.84	10.17	806.17	1.22	1.88	4.89
10/11/03 07:55	3.01	799.01	1.19	1.84	10.17	806.17	1.22	1.88	4.89
10/11/03 08:00	3.01	799.01	1.19	1.84	10.17	806.17	1.21	1.88	4.89
10/11/03 08:05	3.01	799.01	1.19	1.84	10.17	806.17	1.21	1.88	4.88
10/11/03 08:10	3.01	799.01	1.19	1.83	10.17	806.17	1.21	1.87	4.88
10/11/03 08:15	3.01	799.01	1.18	1.83	10.17	806.17	1.21	1.87	4.88
10/11/03 08:20	3.01	799.01	1.18	1.83	10.17	806.17	1.21	1.87	4.88
10/11/03 08:25	3.01	799.01	1.18	1.83	10.17	806.17	1.21	1.87	4.88
10/11/03 08:30	3.01	799.01	1.18	1.83	10.17	806.17	1.21	1.86	4.88
10/11/03 08:35	3.01	799.01	1.18	1.82	10.17	806.17	1.20	1.86	4.87
10/11/03 08:40	3.01	799.01	1.18	1.82	10.17	806.17	1.20	1.86	4.87
10/11/03 08:45	3.01	799.01	1.18	1.82	10.17	806.17	1.20	1.86	4.87
10/11/03 08:50	3.01	799.01	1.17	1.82	10.17	806.17	1.20	1.86	4.87
10/11/03 08:55	3.01	799.01	1.17	1.82	10.17	806.17	1.20	1.85	4.87
10/11/03 09:00	3.01	799.01	1.17	1.81	10.17	806.17	1.20	1.85	4.87
10/11/03 09:05	3.01	799.01	1.17	1.81	10.17	806.17	1.20	1.85	4.87
10/11/03 09:10	3.01	799.01	1.17	1.81	10.17	806.17	1.19	1.85	4.86
10/11/03 09:15	3.01	799.01	1.17	1.81	10.17	806.17	1.19	1.84	4.86
10/11/03 09:20	3.01	799.01	1.17	1.80	10.17	806.17	1.19	1.84	4.86
10/11/03 09:25	3.01	799.01	1.16	1.80	10.17	806.17	1.19	1.84	4.86
10/11/03 09:30	3.01	799.01	1.16	1.80	10.17	806.17	1.19	1.84	4.86
10/11/03 09:35	3.01	799.01	1.16	1.80	10.17	806.17	1.19	1.84	4.86
10/11/03 09:40	3.01	799.01	1.16	1.80	10.17	806.17	1.19	1.83	4.85
10/11/03 09:45	3.01	799.01	1.16	1.79	10.17	806.17	1.18	1.83	4.85
10/11/03 09:50	3.01	799.01	1.16	1.79	10.17	806.17	1.18	1.83	4.85
10/11/03 09:55	3.01	799.01	1.16	1.79	10.17	806.17	1.18	1.83	4.85
10/11/03 10:00	3.01	799.01	1.15	1.79	10.17	806.17	1.18	1.82	4.85
10/11/03 10:05	3.01	799.01	1.15	1.78	10.17	806.17	1.18	1.82	4.85
10/11/03 10:10	3.01	799.01	1.15	1.78	10.17	806.17	1.18	1.82	4.84
10/11/03 10:15	3.01	799.01	1.15	1.78	10.17	806.17	1.18	1.82	4.84
10/11/03 10:20	3.01	799.01	1.15	1.78	10.17	806.17	1.17	1.82	4.84
10/11/03 10:25	3.01	799.01	1.15	1.77	10.17	806.17	1.17	1.81	4.84
10/11/03 10:30	3.01	799.01	1.15	1.77	10.17	806.17	1.17	1.81	4.84
10/11/03 10:35	3.01	799.01	1.14	1.77	10.17	806.17	1.17	1.81	4.84
10/11/03 10:40	3.01	799.01	1.14	1.77	10.17	806.17	1.17	1.81	4.84
10/11/03 10:45	3.01	799.01	1.14	1.77	10.17	806.17	1.17	1.80	4.83
10/11/03 10:50	3.01	799.01	1.14	1.76	10.17	806.17	1.17	1.80	4.83
10/11/03 10:55	3.01	799.01	1.14	1.76	10.17	806.17	1.16	1.80	4.83
10/11/03 11:00	3.01	799.01	1.14	1.76	10.17	806.17	1.16	1.80	4.83
10/11/03 11:05	3.01	799.01	1.13	1.76	10.17	806.17	1.16	1.80	4.83
10/11/03 11:10	3.01	799.01	1.13	1.75	10.17	806.17	1.16	1.79	4.83
10/11/03 11:15	3.01	799.01	1.13	1.75	10.17	806.17	1.16	1.79	4.82

10/11/03 11:20	3.01	799.01	1.13	1.75	10.17	806.17	1.16	1.79	4.82
10/11/03 11:25	3.01	799.01	1.13	1.75	10.17	806.17	1.15	1.79	4.82
10/11/03 11:30	3.01	799.01	1.13	1.74	10.17	806.17	1.15	1.78	4.82
10/11/03 11:35	3.01	799.01	1.13	1.74	10.17	806.17	1.15	1.78	4.82
10/11/03 11:40	3.01	799.01	1.12	1.74	10.17	806.17	1.15	1.78	4.82
10/11/03 11:45	3.01	799.01	1.12	1.74	10.17	806.17	1.15	1.78	4.81
10/11/03 11:50	3.01	799.01	1.12	1.73	10.17	806.17	1.15	1.78	4.81
10/11/03 11:55	3.01	799.01	1.12	1.73	10.17	806.17	1.15	1.77	4.81
10/11/03 12:00	3.01	799.01	1.12	1.73	10.17	806.17	1.14	1.77	4.81
10/11/03 12:05	3.01	799.01	1.12	1.73	10.17	806.17	1.14	1.77	4.81
10/11/03 12:10	3.01	799.01	1.11	1.72	10.17	806.17	1.14	1.77	4.81
10/11/03 12:15	3.01	799.01	1.11	1.72	10.17	806.17	1.14	1.76	4.80
10/11/03 12:20	3.01	799.01	1.11	1.72	10.17	806.17	1.14	1.76	4.80
10/11/03 12:25	3.01	799.01	1.11	1.72	10.17	806.17	1.14	1.76	4.80
10/11/03 12:30	3.01	799.01	1.11	1.71	10.17	806.17	1.14	1.76	4.80
10/11/03 12:35	3.01	799.01	1.11	1.71	10.17	806.17	1.13	1.75	4.80
10/11/03 12:40	3.01	799.01	1.11	1.71	10.17	806.17	1.13	1.75	4.79
10/11/03 12:45	3.01	799.01	1.10	1.71	10.16	806.16	1.13	1.75	4.79
10/11/03 12:50	3.01	799.01	1.10	1.71	10.16	806.16	1.13	1.75	4.79
10/11/03 12:55	3.01	799.01	1.10	1.70	10.16	806.16	1.13	1.74	4.79
10/11/03 13:00	3.01	799.01	1.10	1.70	10.16	806.16	1.13	1.74	4.79
10/11/03 13:05	3.01	799.01	1.10	1.70	10.16	806.16	1.12	1.74	4.79
10/11/03 13:10	3.01	799.01	1.10	1.70	10.16	806.16	1.12	1.74	4.78
10/11/03 13:15	3.01	799.01	1.09	1.69	10.16	806.16	1.12	1.74	4.78
10/11/03 13:20	3.01	799.01	1.09	1.69	10.16	806.16	1.12	1.73	4.78
10/11/03 13:25	3.01	799.01	1.09	1.69	10.16	806.16	1.12	1.73	4.78
10/11/03 13:30	3.01	799.01	1.09	1.68	10.16	806.16	1.12	1.73	4.78
10/11/03 13:35	3.01	799.01	1.09	1.68	10.16	806.16	1.12	1.73	4.78
10/11/03 13:40	3.01	799.01	1.08	1.68	10.16	806.16	1.11	1.72	4.77
10/11/03 13:45	3.01	799.01	1.08	1.67	10.16	806.16	1.11	1.72	4.77
10/11/03 13:50	3.01	799.01	1.08	1.67	10.16	806.16	1.11	1.72	4.77
10/11/03 13:55	3.01	799.01	1.08	1.67	10.16	806.16	1.11	1.72	4.77
10/11/03 14:00	3.01	799.01	1.08	1.66	10.16	806.16	1.11	1.71	4.77
10/11/03 14:05	3.01	799.01	1.07	1.66	10.16	806.16	1.11	1.71	4.76
10/11/03 14:10	3.01	799.01	1.07	1.66	10.16	806.16	1.10	1.71	4.76
10/11/03 14:15	3.01	799.01	1.07	1.65	10.16	806.16	1.10	1.70	4.76
10/11/03 14:20	3.01	799.01	1.07	1.65	10.16	806.16	1.10	1.70	4.76
10/11/03 14:25	3.01	799.01	1.06	1.65	10.16	806.16	1.10	1.70	4.76
10/11/03 14:30	3.01	799.01	1.06	1.64	10.16	806.16	1.10	1.70	4.75
10/11/03 14:35	3.01	799.01	1.06	1.64	10.16	806.16	1.09	1.69	4.75
10/11/03 14:40	3.01	799.01	1.06	1.64	10.16	806.16	1.09	1.69	4.75
10/11/03 14:45	3.01	799.01	1.05	1.63	10.16	806.16	1.09	1.69	4.75
10/11/03 14:50	3.01	799.01	1.05	1.63	10.16	806.16	1.09	1.68	4.74
10/11/03 14:55	3.01	799.01	1.05	1.62	10.16	806.16	1.09	1.68	4.74
10/11/03 15:00	3.01	799.01	1.05	1.62	10.16	806.16	1.08	1.68	4.74
10/11/03 15:05	3.01	799.01	1.04	1.61	10.16	806.16	1.08	1.67	4.74
10/11/03 15:10	3.01	799.01	1.04	1.61	10.16	806.16	1.08	1.67	4.73
10/11/03 15:15	3.01	799.01	1.04	1.61	10.16	806.16	1.08	1.67	4.73
10/11/03 15:20	3.01	799.01	1.04	1.60	10.16	806.16	1.08	1.66	4.73
10/11/03 15:25	3.01	799.01	1.03	1.60	10.16	806.16	1.07	1.66	4.73
10/11/03 15:30	3.01	799.01	1.03	1.59	10.16	806.16	1.07	1.66	4.72
10/11/03 15:35	3.01	799.01	1.03	1.59	10.16	806.16	1.07	1.65	4.72
10/11/03 15:40	3.01	799.01	1.02	1.58	10.16	806.16	1.07	1.65	4.72
10/11/03 15:45	3.01	799.01	1.02	1.58	10.16	806.16	1.06	1.65	4.71
10/11/03 15:50	3.01	799.01	1.02	1.57	10.16	806.16	1.06	1.64	4.71
10/11/03 15:55	3.01	799.01	1.01	1.57	10.16	806.16	1.06	1.64	4.71
10/11/03 16:00	3.01	799.01	1.01	1.57	10.16	806.16	1.06	1.63	4.71
10/11/03 16:05	3.01	799.01	1.01	1.56	10.16	806.16	1.05	1.63	4.70
10/11/03 16:10	3.01	799.01	1.01	1.56	10.16	806.16	1.05	1.63	4.70
10/11/03 16:15	3.01	799.01	1.00	1.55	10.16	806.16	1.05	1.62	4.70
10/11/03 16:20	3.01	799.01	1.00	1.55	10.16	806.16	1.05	1.62	4.69
10/11/03 16:25	3.01	799.01	1.00	1.54	10.16	806.16	1.04	1.62	4.69
10/11/03 16:30	3.01	799.01	0.99	1.54	10.16	806.16	1.04	1.61	4.69
10/11/03 16:35	3.01	799.01	0.99	1.53	10.16	806.16	1.04	1.61	4.68
10/11/03 16:40	3.01	799.01	0.99	1.53	10.16	806.16	1.04	1.60	4.68
10/11/03 16:45	3.01	799.01	0.98	1.52	10.16	806.16	1.03	1.60	4.68
10/11/03 16:50	3.01	799.01	0.98	1.52	10.16	806.16	1.03	1.59	4.67
10/11/03 16:55	3.01	799.01	0.98	1.51	10.15	806.15	1.03	1.59	4.67

10/11/03 17:00	3.01	799.01	0.97	1.51	10.15	806.15	1.03	1.59	4.67
10/11/03 17:05	3.01	799.01	0.97	1.50	10.15	806.15	1.02	1.58	4.66
10/11/03 17:10	3.01	799.01	0.97	1.50	10.15	806.15	1.02	1.58	4.66
10/11/03 17:15	3.01	799.01	0.96	1.49	10.15	806.15	1.02	1.57	4.66
10/11/03 17:20	3.01	799.01	0.96	1.49	10.15	806.15	1.01	1.57	4.65
10/11/03 17:25	3.01	799.01	0.96	1.48	10.15	806.15	1.01	1.56	4.65
10/11/03 17:30	3.01	799.01	0.96	1.48	10.15	806.15	1.01	1.56	4.65
10/11/03 17:35	3.01	799.01	0.95	1.47	10.15	806.15	1.01	1.56	4.64
10/11/03 17:40	3.01	799.01	0.95	1.47	10.15	806.15	1.00	1.55	4.64
10/11/03 17:45	3.01	799.01	0.95	1.46	10.15	806.15	1.00	1.55	4.63
10/11/03 17:50	3.01	799.01	0.94	1.46	10.15	806.15	1.00	1.54	4.63
10/11/03 17:55	3.01	799.01	0.94	1.45	10.15	806.15	0.99	1.54	4.63
10/11/03 18:00	3.01	799.01	0.94	1.45	10.15	806.15	0.99	1.53	4.62
10/11/03 18:05	3.01	799.01	0.93	1.44	10.15	806.15	0.99	1.53	4.62
10/11/03 18:10	3.01	799.01	0.93	1.44	10.15	806.15	0.98	1.52	4.61
10/11/03 18:15	3.01	799.01	0.93	1.43	10.15	806.15	0.98	1.52	4.61
10/11/03 18:20	3.01	799.01	0.92	1.43	10.15	806.15	0.98	1.51	4.60
10/11/03 18:25	3.01	799.01	0.92	1.42	10.15	806.15	0.98	1.51	4.60
10/11/03 18:30	3.01	799.01	0.92	1.42	10.15	806.15	0.97	1.51	4.59
10/11/03 18:35	3.01	799.01	0.91	1.41	10.15	806.15	0.97	1.50	4.59
10/11/03 18:40	3.01	799.01	0.91	1.41	10.15	806.15	0.97	1.50	4.59
10/11/03 18:45	3.01	799.01	0.91	1.40	10.15	806.15	0.96	1.49	4.58
10/11/03 18:50	3.01	799.01	0.90	1.40	10.15	806.15	0.96	1.49	4.58
10/11/03 18:55	3.01	799.01	0.90	1.39	10.15	806.15	0.96	1.48	4.57
10/11/03 19:00	3.01	799.01	0.90	1.39	10.15	806.15	0.95	1.48	4.57
10/11/03 19:05	3.01	799.01	0.90	1.39	10.15	806.15	0.95	1.47	4.56
10/11/03 19:10	3.01	799.01	0.89	1.38	10.15	806.15	0.95	1.47	4.56
10/11/03 19:15	3.01	799.01	0.89	1.38	10.15	806.15	0.95	1.46	4.55
10/11/03 19:20	3.01	799.01	0.89	1.37	10.15	806.15	0.94	1.46	4.55
10/11/03 19:25	3.01	799.01	0.88	1.37	10.15	806.15	0.94	1.45	4.55
10/11/03 19:30	3.01	799.01	0.88	1.36	10.15	806.15	0.94	1.45	4.54
10/11/03 19:35	3.01	799.01	0.88	1.36	10.15	806.15	0.93	1.44	4.54
10/11/03 19:40	3.01	799.01	0.87	1.35	10.14	806.14	0.93	1.44	4.53
10/11/03 19:45	3.01	799.01	0.87	1.35	10.14	806.14	0.93	1.44	4.53
10/11/03 19:50	3.01	799.01	0.87	1.34	10.14	806.14	0.92	1.43	4.52
10/11/03 19:55	3.01	799.01	0.87	1.34	10.14	806.14	0.92	1.43	4.52
10/11/03 20:00	3.01	799.01	0.86	1.33	10.14	806.14	0.92	1.42	4.51
10/11/03 20:05	3.01	799.01	0.86	1.33	10.14	806.14	0.92	1.42	4.51
10/11/03 20:10	3.01	799.01	0.86	1.32	10.14	806.14	0.91	1.41	4.50
10/11/03 20:15	3.01	799.01	0.85	1.32	10.14	806.14	0.91	1.41	4.50
10/11/03 20:20	3.01	799.01	0.85	1.32	10.14	806.14	0.91	1.40	4.49
10/11/03 20:25	3.01	799.01	0.85	1.31	10.14	806.14	0.90	1.40	4.49
10/11/03 20:30	3.01	799.01	0.85	1.31	10.14	806.14	0.90	1.39	4.49
10/11/03 20:35	3.01	799.01	0.84	1.30	10.14	806.14	0.90	1.39	4.48
10/11/03 20:40	3.01	799.01	0.84	1.30	10.14	806.14	0.90	1.38	4.48
10/11/03 20:45	3.01	799.01	0.84	1.30	10.14	806.14	0.89	1.38	4.47
10/11/03 20:50	3.01	799.01	0.84	1.29	10.14	806.14	0.89	1.38	4.47
10/11/03 20:55	3.01	799.01	0.83	1.29	10.14	806.14	0.89	1.37	4.46
10/11/03 21:00	3.01	799.01	0.83	1.29	10.14	806.14	0.88	1.37	4.46
10/11/03 21:05	3.01	799.01	0.83	1.28	10.14	806.14	0.88	1.36	4.45
10/11/03 21:10	3.01	799.01	0.83	1.28	10.14	806.14	0.88	1.36	4.45
10/11/03 21:15	3.01	799.01	0.83	1.28	10.14	806.14	0.88	1.35	4.45
10/11/03 21:20	3.01	799.01	0.82	1.27	10.14	806.14	0.87	1.35	4.44
10/11/03 21:25	3.01	799.01	0.82	1.27	10.14	806.14	0.87	1.35	4.44
10/11/03 21:30	3.01	799.01	0.82	1.27	10.14	806.14	0.87	1.34	4.44
10/11/03 21:35	3.01	799.01	0.82	1.26	10.14	806.14	0.87	1.34	4.43
10/11/03 21:40	3.01	799.01	0.82	1.26	10.14	806.14	0.86	1.34	4.43
10/11/03 21:45	3.01	799.01	0.81	1.26	10.14	806.14	0.86	1.33	4.43
10/11/03 21:50	3.01	799.01	0.81	1.26	10.14	806.14	0.86	1.33	4.42
10/11/03 21:55	3.01	799.01	0.81	1.25	10.14	806.14	0.86	1.32	4.42
10/11/03 22:00	3.01	799.01	0.81	1.25	10.14	806.14	0.85	1.32	4.42
10/11/03 22:05	3.01	799.01	0.81	1.25	10.14	806.14	0.85	1.32	4.41
10/11/03 22:10	3.01	799.01	0.80	1.25	10.14	806.14	0.85	1.31	4.41
10/11/03 22:15	3.01	799.01	0.80	1.24	10.14	806.14	0.85	1.31	4.41
10/11/03 22:20	3.01	799.01	0.80	1.24	10.14	806.14	0.84	1.31	4.40
10/11/03 22:25	3.01	799.01	0.80	1.24	10.14	806.14	0.84	1.30	4.40
10/11/03 22:30	3.01	799.01	0.80	1.24	10.14	806.14	0.84	1.30	4.40
10/11/03 22:35	3.01	799.01	0.80	1.23	10.14	806.14	0.84	1.30	4.40

10/11/03 22:40	3.01	799.01	0.80	1.23	10.13	806.13	0.84	1.29	4.39
10/11/03 22:45	3.01	799.01	0.79	1.23	10.13	806.13	0.83	1.29	4.39
10/11/03 22:50	3.01	799.01	0.79	1.23	10.13	806.13	0.83	1.29	4.39
10/11/03 22:55	3.01	799.01	0.79	1.22	10.13	806.13	0.83	1.28	4.39
10/11/03 23:00	3.01	799.01	0.79	1.22	10.13	806.13	0.83	1.28	4.38
10/11/03 23:05	3.01	799.01	0.79	1.22	10.13	806.13	0.83	1.28	4.38
10/11/03 23:10	3.01	799.01	0.79	1.22	10.13	806.13	0.82	1.27	4.38
10/11/03 23:15	3.01	799.01	0.79	1.22	10.13	806.13	0.82	1.27	4.37
10/11/03 23:20	3.01	799.01	0.78	1.21	10.13	806.13	0.82	1.27	4.37
10/11/03 23:25	3.01	799.01	0.78	1.21	10.13	806.13	0.82	1.27	4.37
10/11/03 23:30	3.01	799.01	0.78	1.21	10.13	806.13	0.82	1.26	4.37
10/11/03 23:35	3.01	799.01	0.78	1.21	10.13	806.13	0.81	1.26	4.37
10/11/03 23:40	3.01	799.01	0.78	1.21	10.13	806.13	0.81	1.26	4.36
10/11/03 23:45	3.01	799.01	0.78	1.20	10.13	806.13	0.81	1.25	4.36
10/11/03 23:50	3.01	799.01	0.78	1.20	10.13	806.13	0.81	1.25	4.36
10/11/03 23:55	3.01	799.01	0.78	1.20	10.13	806.13	0.81	1.25	4.36
10/12/03 00:00	3.01	799.01	0.77	1.20	10.13	806.13	0.81	1.25	4.35
10/12/03 00:05	3.01	799.01	0.77	1.20	10.13	806.13	0.80	1.24	4.35
10/12/03 00:10	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.35
10/12/03 00:15	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.35
10/12/03 00:20	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.35
10/12/03 00:25	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.24	4.34
10/12/03 00:30	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.23	4.34
10/12/03 00:35	3.01	799.01	0.77	1.19	10.13	806.13	0.80	1.23	4.34
10/12/03 00:40	3.01	799.01	0.77	1.18	10.13	806.13	0.79	1.23	4.34
10/12/03 00:45	3.01	799.01	0.76	1.18	10.13	806.13	0.79	1.23	4.34
10/12/03 00:50	3.01	799.01	0.76	1.18	10.13	806.13	0.79	1.22	4.33
10/12/03 00:55	3.01	799.01	0.76	1.18	10.13	806.13	0.79	1.22	4.33
10/12/03 01:00	3.01	799.01	0.76	1.18	10.13	806.13	0.79	1.22	4.33
10/12/03 01:05	3.01	799.01	0.76	1.18	10.13	806.13	0.79	1.22	4.33
10/12/03 01:10	3.01	799.01	0.76	1.17	10.13	806.13	0.79	1.22	4.33
10/12/03 01:15	3.01	799.01	0.76	1.17	10.13	806.13	0.78	1.21	4.32
10/12/03 01:20	3.01	799.01	0.76	1.17	10.13	806.13	0.78	1.21	4.32
10/12/03 01:25	3.01	799.01	0.76	1.18	10.13	806.13	0.78	1.21	4.32
10/12/03 01:30	3.01	799.01	0.76	1.17	10.13	806.13	0.78	1.21	4.32
10/12/03 01:35	3.01	799.01	0.76	1.17	10.13	806.13	0.78	1.21	4.32
10/12/03 01:40	3.01	799.01	0.76	1.17	10.13	806.13	0.78	1.20	4.32
10/12/03 01:45	3.01	799.01	0.75	1.17	10.13	806.13	0.78	1.20	4.31
10/12/03 01:50	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.20	4.31
10/12/03 01:55	3.01	799.01	0.75	1.16	10.13	806.13	0.78	1.20	4.31
10/12/03 02:00	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.20	4.31
10/12/03 02:05	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.20	4.31
10/12/03 02:10	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.19	4.31
10/12/03 02:15	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.19	4.30
10/12/03 02:20	3.01	799.01	0.75	1.15	10.13	806.13	0.77	1.19	4.30
10/12/03 02:25	3.01	799.01	0.74	1.15	10.13	806.13	0.77	1.19	4.30
10/12/03 02:30	3.01	799.01	0.74	1.15	10.13	806.13	0.77	1.19	4.30
10/12/03 02:35	3.01	799.01	0.74	1.15	10.13	806.13	0.77	1.18	4.30
10/12/03 02:40	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.18	4.30
10/12/03 02:45	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.18	4.29
10/12/03 02:50	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.18	4.29
10/12/03 02:55	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.18	4.29
10/12/03 03:00	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.18	4.29
10/12/03 03:05	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.29
10/12/03 03:10	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.29
10/12/03 03:15	3.01	799.01	0.74	1.14	10.13	806.13	0.76	1.17	4.28
10/12/03 03:20	3.01	799.01	0.73	1.14	10.13	806.13	0.76	1.17	4.28
10/12/03 03:25	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.17	4.28
10/12/03 03:30	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.17	4.28
10/12/03 03:35	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.28
10/12/03 03:40	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.28
10/12/03 03:45	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.28
10/12/03 03:50	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/12/03 03:55	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/12/03 04:00	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/12/03 04:05	3.01	799.01	0.73	1.12	10.13	806.13	0.75	1.15	4.27
10/12/03 04:10	3.01	799.01	0.73	1.12	10.12	806.12	0.75	1.15	4.27
10/12/03 04:15	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.27

10/12/03 04:20	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.27
10/12/03 04:25	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.26
10/12/03 04:30	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.26
10/12/03 04:35	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.15	4.26
10/12/03 04:40	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.26
10/12/03 04:45	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.26
10/12/03 04:50	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.26
10/12/03 04:55	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.26
10/12/03 05:00	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.25
10/12/03 05:05	3.01	799.01	0.72	1.11	10.12	806.12	0.74	1.14	4.25
10/12/03 05:10	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.14	4.25
10/12/03 05:15	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 05:20	3.01	799.01	0.71	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 05:25	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.25
10/12/03 05:30	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.25
10/12/03 05:35	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/12/03 05:40	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/12/03 05:45	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/12/03 05:50	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/12/03 05:55	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/12/03 06:00	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/12/03 06:05	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.24
10/12/03 06:10	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.24
10/12/03 06:15	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.23
10/12/03 06:20	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.23
10/12/03 06:25	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.12	4.23
10/12/03 06:30	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/12/03 06:35	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/12/03 06:40	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/12/03 06:45	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/12/03 06:50	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.23
10/12/03 06:55	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.22
10/12/03 07:00	3.01	799.01	0.70	1.08	10.12	806.12	0.72	1.11	4.22
10/12/03 07:05	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.11	4.22
10/12/03 07:10	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/12/03 07:15	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/12/03 07:20	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/12/03 07:25	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/12/03 07:30	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/12/03 07:35	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.22
10/12/03 07:40	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.21
10/12/03 07:45	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.21
10/12/03 07:50	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.21
10/12/03 07:55	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/12/03 08:00	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/12/03 08:05	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/12/03 08:10	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/12/03 08:15	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.21
10/12/03 08:20	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.21
10/12/03 08:25	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/12/03 08:30	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/12/03 08:35	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/12/03 08:40	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.09	4.20
10/12/03 08:45	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.08	4.20
10/12/03 08:50	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.08	4.20
10/12/03 08:55	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.20
10/12/03 09:00	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.20
10/12/03 09:05	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.20
10/12/03 09:10	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.20
10/12/03 09:15	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.19
10/12/03 09:20	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.19
10/12/03 09:25	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.19
10/12/03 09:30	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/12/03 09:35	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/12/03 09:40	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/12/03 09:45	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/12/03 09:50	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/12/03 09:55	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19

10/12/03 10:00	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.18
10/12/03 10:05	3.01	799.01	0.68	1.04	10.12	806.12	0.69	1.07	4.18
10/12/03 10:10	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.07	4.18
10/12/03 10:15	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/12/03 10:20	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/12/03 10:25	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/12/03 10:30	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/12/03 10:35	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/12/03 10:40	3.01	799.01	0.67	1.04	10.12	806.12	0.68	1.06	4.17
10/12/03 10:45	3.01	799.01	0.67	1.04	10.12	806.12	0.68	1.06	4.17
10/12/03 10:50	3.01	799.01	0.67	1.04	10.12	806.12	0.68	1.06	4.17
10/12/03 10:55	3.01	799.01	0.67	1.04	10.12	806.12	0.68	1.06	4.17
10/12/03 11:00	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.06	4.17
10/12/03 11:05	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.17
10/12/03 11:10	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.17
10/12/03 11:15	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.17
10/12/03 11:20	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.16
10/12/03 11:25	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.16
10/12/03 11:30	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/12/03 11:35	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/12/03 11:40	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/12/03 11:45	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/12/03 11:50	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.05	4.16
10/12/03 11:55	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.04	4.16
10/12/03 12:00	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:05	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:10	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:15	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:20	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:25	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:30	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:35	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:40	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/12/03 12:45	3.01	799.01	0.66	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 12:50	3.01	799.01	0.66	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 12:55	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 13:00	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 13:05	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 13:10	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 13:15	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/12/03 13:20	3.01	799.01	0.65	1.01	10.12	806.12	0.66	1.03	4.14
10/12/03 13:25	3.01	799.01	0.65	1.01	10.12	806.12	0.66	1.03	4.13
10/12/03 13:30	3.01	799.01	0.65	1.01	10.12	806.12	0.66	1.03	4.13
10/12/03 13:35	3.01	799.01	0.65	1.01	10.12	806.12	0.66	1.03	4.13
10/12/03 13:40	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/12/03 13:45	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/12/03 13:50	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/12/03 13:55	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/12/03 14:00	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/12/03 14:05	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/12/03 14:10	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.12
10/12/03 14:15	3.01	799.01	0.65	1.00	10.11	806.11	0.66	1.02	4.12
10/12/03 14:20	3.01	799.01	0.64	1.00	10.11	806.11	0.66	1.02	4.12
10/12/03 14:25	3.01	799.01	0.64	1.00	10.11	806.11	0.66	1.02	4.12
10/12/03 14:30	3.01	799.01	0.64	1.00	10.11	806.11	0.66	1.01	4.12
10/12/03 14:35	3.01	799.01	0.64	0.99	10.11	806.11	0.66	1.01	4.12
10/12/03 14:40	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.12
10/12/03 14:45	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.12
10/12/03 14:50	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.12
10/12/03 14:55	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/12/03 15:00	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/12/03 15:05	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/12/03 15:10	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/12/03 15:15	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/12/03 15:20	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/12/03 15:25	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.00	4.11
10/12/03 15:30	3.01	799.01	0.64	0.98	10.11	806.11	0.65	1.00	4.11
10/12/03 15:35	3.01	799.01	0.64	0.98	10.11	806.11	0.65	1.00	4.10

10/12/03 15:40	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/12/03 15:45	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/12/03 15:50	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/12/03 15:55	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/12/03 16:00	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/12/03 16:05	3.01	799.01	0.63	0.98	10.11	806.11	0.64	1.00	4.10
10/12/03 16:10	3.01	799.01	0.63	0.98	10.11	806.11	0.64	1.00	4.10
10/12/03 16:15	3.01	799.01	0.63	0.98	10.11	806.11	0.64	1.00	4.10
10/12/03 16:20	3.01	799.01	0.63	0.98	10.11	806.11	0.64	0.99	4.09
10/12/03 16:25	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 16:30	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 16:35	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 16:40	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 16:45	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 16:50	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 16:55	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 17:00	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/12/03 17:05	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.08
10/12/03 17:10	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.08
10/12/03 17:15	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.98	4.08
10/12/03 17:20	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.98	4.08
10/12/03 17:25	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.98	4.08
10/12/03 17:30	3.01	799.01	0.63	0.97	10.11	806.11	0.63	0.98	4.08
10/12/03 17:35	3.01	799.01	0.63	0.97	10.11	806.11	0.63	0.98	4.08
10/12/03 17:40	3.01	799.01	0.63	0.97	10.11	806.11	0.63	0.98	4.08
10/12/03 17:45	3.01	799.01	0.63	0.97	10.11	806.11	0.63	0.98	4.08
10/12/03 17:50	3.01	799.01	0.63	0.97	10.11	806.11	0.63	0.98	4.08
10/12/03 17:55	3.01	799.01	0.63	0.97	10.11	806.11	0.63	0.98	4.08
10/12/03 18:00	3.01	799.01	0.62	0.97	10.11	806.11	0.63	0.98	4.07
10/12/03 18:05	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/12/03 18:10	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/12/03 18:15	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/12/03 18:20	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/12/03 18:25	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 18:30	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 18:35	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 18:40	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 18:45	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/12/03 18:50	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.06
10/12/03 18:55	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.06
10/12/03 19:00	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.06
10/12/03 19:05	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/12/03 19:10	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/12/03 19:15	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.06
10/12/03 19:20	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.06
10/12/03 19:25	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 19:30	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 19:35	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 19:40	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 19:45	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 19:50	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 19:55	3.01	799.01	0.60	0.94	10.11	806.11	0.62	0.96	4.05
10/12/03 20:00	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/12/03 20:05	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 20:10	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 20:15	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 20:20	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/12/03 20:25	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/12/03 20:30	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/12/03 20:35	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/12/03 20:40	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/12/03 20:45	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.03
10/12/03 20:50	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.03
10/12/03 20:55	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 21:00	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 21:05	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 21:10	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 21:15	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03

10/12/03 21:20	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/12/03 21:25	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/12/03 21:30	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/12/03 21:35	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/12/03 21:40	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/12/03 21:45	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.94	4.02
10/12/03 21:50	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/12/03 21:55	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/12/03 22:00	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/12/03 22:05	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:10	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:15	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:20	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:25	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:30	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:35	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/12/03 22:40	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.01
10/12/03 22:45	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 22:50	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 22:55	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 23:00	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/12/03 23:05	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 23:10	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 23:15	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 23:20	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/12/03 23:25	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	3.99
10/12/03 23:30	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	3.99
10/12/03 23:35	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 23:40	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 23:45	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 23:50	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/12/03 23:55	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/13/03 00:00	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/13/03 00:05	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 00:10	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 00:15	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 00:20	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 00:25	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 00:30	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/13/03 00:35	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/13/03 00:40	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/13/03 00:45	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 00:50	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 00:55	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 01:00	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 01:05	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 01:10	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 01:15	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 01:20	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 01:25	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 01:30	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 01:35	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 01:40	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 01:45	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 01:50	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 01:55	3.01	799.01	0.56	0.87	10.11	806.11	0.57	0.89	3.96
10/13/03 02:00	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.96
10/13/03 02:05	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.95
10/13/03 02:10	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.95
10/13/03 02:15	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.89	3.95
10/13/03 02:20	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 02:25	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 02:30	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 02:35	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 02:40	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 02:45	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.94
10/13/03 02:50	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/13/03 02:55	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94

10/13/03 03:00	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/13/03 03:05	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/13/03 03:10	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.87	3.94
10/13/03 03:15	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.94
10/13/03 03:20	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.94
10/13/03 03:25	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 03:30	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 03:35	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 03:40	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 03:45	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 03:50	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 03:55	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 04:00	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 04:05	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:10	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:15	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:20	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:25	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:30	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:35	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 04:40	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.92
10/13/03 04:45	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/13/03 04:50	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/13/03 04:55	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/13/03 05:00	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 05:05	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 05:10	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 05:15	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 05:20	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:25	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:30	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:35	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:40	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:45	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:50	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 05:55	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.84	3.90
10/13/03 06:00	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.84	3.89
10/13/03 06:05	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:10	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:15	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:20	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:25	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:30	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:35	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 06:40	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.88
10/13/03 06:45	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.84	3.88
10/13/03 06:50	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 06:55	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 07:00	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 07:05	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 07:10	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 07:15	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/13/03 07:20	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/13/03 07:25	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/13/03 07:30	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/13/03 07:35	3.01	799.01	0.52	0.81	10.10	806.10	0.53	0.83	3.87
10/13/03 07:40	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.83	3.87
10/13/03 07:45	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.87
10/13/03 07:50	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.87
10/13/03 07:55	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:00	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:05	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:10	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:15	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:20	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:25	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 08:30	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.82	3.85
10/13/03 08:35	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.82	3.85

10/13/03 08:40	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.81	3.85
10/13/03 08:45	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.81	3.85
10/13/03 08:50	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.81	3.85
10/13/03 08:55	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/13/03 09:00	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/13/03 09:05	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 09:10	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 09:15	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 09:20	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 09:25	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 09:30	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.81	3.84
10/13/03 09:35	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.80	3.84
10/13/03 09:40	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.80	3.84
10/13/03 09:45	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 09:50	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 09:55	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 10:00	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 10:05	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 10:10	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 10:15	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 10:20	3.01	799.01	0.50	0.78	10.10	806.10	0.51	0.80	3.82
10/13/03 10:25	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 10:30	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 10:35	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 10:40	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 10:45	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 10:50	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 10:55	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 11:00	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 11:05	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 11:10	3.01	799.01	0.49	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 11:15	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/13/03 11:20	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 11:25	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 11:30	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 11:35	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 11:40	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80
10/13/03 11:45	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80
10/13/03 11:50	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80
10/13/03 11:55	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80
10/13/03 12:00	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.79
10/13/03 12:05	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.79
10/13/03 12:10	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.78	3.79
10/13/03 12:15	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.77	3.79
10/13/03 12:20	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.77	3.79
10/13/03 12:25	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.77	3.79
10/13/03 12:30	3.01	799.01	0.49	0.75	10.10	806.10	0.50	0.77	3.79
10/13/03 12:35	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/13/03 12:40	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/13/03 12:45	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/13/03 12:50	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/13/03 12:55	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/13/03 13:00	3.01	799.01	0.48	0.75	10.10	806.10	0.50	0.77	3.78
10/13/03 13:05	3.01	799.01	0.48	0.74	10.10	806.10	0.49	0.77	3.78
10/13/03 13:10	3.01	799.01	0.48	0.74	10.10	806.10	0.49	0.76	3.78
10/13/03 13:15	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:20	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:25	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:30	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:35	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:40	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:45	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.77
10/13/03 13:50	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.76
10/13/03 13:55	3.01	799.01	0.48	0.74	10.09	806.09	0.49	0.76	3.76
10/13/03 14:00	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.76	3.76
10/13/03 14:05	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 14:10	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 14:15	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76

10/13/03 14:20	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 14:25	3.01	799.01	0.47	0.73	10.09	806.09	0.49	0.75	3.76
10/13/03 14:30	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.76
10/13/03 14:35	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.76
10/13/03 14:40	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/13/03 14:45	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/13/03 14:50	3.01	799.01	0.47	0.73	10.09	806.09	0.48	0.75	3.75
10/13/03 14:55	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.75	3.75
10/13/03 15:00	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 15:05	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 15:10	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 15:15	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.75
10/13/03 15:20	3.01	799.01	0.47	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 15:25	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 15:30	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 15:35	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 15:40	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 15:45	3.01	799.01	0.46	0.72	10.09	806.09	0.48	0.74	3.74
10/13/03 15:50	3.01	799.01	0.46	0.71	10.09	806.09	0.48	0.74	3.74
10/13/03 15:55	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:00	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:05	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:10	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:15	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:20	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:25	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:30	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.73
10/13/03 16:35	3.01	799.01	0.46	0.71	10.09	806.09	0.47	0.73	3.72
10/13/03 16:40	3.01	799.01	0.46	0.70	10.09	806.09	0.47	0.73	3.72
10/13/03 16:45	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.73	3.72
10/13/03 16:50	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 16:55	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 17:00	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 17:05	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 17:10	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.72
10/13/03 17:15	3.01	799.01	0.45	0.70	10.09	806.09	0.47	0.72	3.71
10/13/03 17:20	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 17:25	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 17:30	3.01	799.01	0.45	0.70	10.09	806.09	0.46	0.72	3.71
10/13/03 17:35	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.72	3.71
10/13/03 17:40	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.72	3.71
10/13/03 17:45	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.71
10/13/03 17:50	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.71
10/13/03 17:55	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:00	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:05	3.01	799.01	0.45	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:10	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:15	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:20	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:25	3.01	799.01	0.44	0.69	10.09	806.09	0.46	0.71	3.70
10/13/03 18:30	3.01	799.01	0.44	0.68	10.09	806.09	0.46	0.71	3.70
10/13/03 18:35	3.01	799.01	0.44	0.68	10.09	806.09	0.46	0.71	3.69
10/13/03 18:40	3.01	799.01	0.44	0.68	10.09	806.09	0.46	0.70	3.69
10/13/03 18:45	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 18:50	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 18:55	3.01	799.01	0.46	0.70	10.09	806.09	0.45	0.70	3.69
10/13/03 19:00	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 19:05	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 19:10	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.69
10/13/03 19:15	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 19:20	3.01	799.01	0.44	0.68	10.09	806.09	0.45	0.70	3.68
10/13/03 19:25	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.70	3.68
10/13/03 19:30	3.01	799.01	0.44	0.67	10.09	806.09	0.45	0.70	3.68
10/13/03 19:35	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.70	3.68
10/13/03 19:40	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.68
10/13/03 19:45	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.68
10/13/03 19:50	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.68
10/13/03 19:55	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67

10/13/03 20:00	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 20:05	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 20:10	3.01	799.01	0.43	0.67	10.09	806.09	0.45	0.69	3.67
10/13/03 20:15	3.01	799.01	0.43	0.67	10.09	806.09	0.44	0.69	3.67
10/13/03 20:20	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.69	3.67
10/13/03 20:25	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.69	3.67
10/13/03 20:30	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 20:35	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 20:40	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 20:45	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 20:50	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 20:55	3.01	799.01	0.43	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 21:00	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 21:05	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.68	3.66
10/13/03 21:10	3.01	799.01	0.42	0.66	10.09	806.09	0.44	0.68	3.65
10/13/03 21:15	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.65
10/13/03 21:20	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.68	3.65
10/13/03 21:25	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.67	3.65
10/13/03 21:30	3.01	799.01	0.42	0.65	10.09	806.09	0.44	0.67	3.65
10/13/03 21:35	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 21:40	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 21:45	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.65
10/13/03 21:50	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 21:55	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 22:00	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 22:05	3.01	799.01	0.42	0.65	10.09	806.09	0.43	0.67	3.64
10/13/03 22:10	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.67	3.64
10/13/03 22:15	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.67	3.64
10/13/03 22:20	3.01	799.01	0.42	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 22:25	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 22:30	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 22:35	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 22:40	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 22:45	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.63
10/13/03 22:50	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 22:55	3.01	799.01	0.41	0.64	10.09	806.09	0.43	0.66	3.62
10/13/03 23:00	3.01	799.01	0.41	0.64	10.09	806.09	0.42	0.66	3.62
10/13/03 23:05	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.66	3.62
10/13/03 23:10	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.66	3.62
10/13/03 23:15	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.62
10/13/03 23:20	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 23:25	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 23:30	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 23:35	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 23:40	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 23:45	3.01	799.01	0.41	0.63	10.09	806.09	0.42	0.65	3.61
10/13/03 23:50	3.01	799.01	0.40	0.63	10.09	806.09	0.42	0.65	3.60
10/13/03 23:55	3.01	799.01	0.40	0.62	10.09	806.09	0.42	0.65	3.60
10/14/03 00:00	3.01	799.01	0.40	0.62	10.08	806.08	0.42	0.65	3.60

	4MR Core Project Alterantive - 100-Year, 24-Hour Design Storm (711 and 733 Mon River Stage)								
	PHL Forebay		PHL Forebay Weir		Panther Hollow Lake		PHL Underflow Pipe		
Maximums	3.8	799.8	212.4	328.6	16.8	812.8	33.0	51.0	10.4
Date/Time	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Depth (ft)	Elevation (ft)	Flow (mgd)	Flow (cfs)	Velocity (fps)
10/07/03 00:05	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:10	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:15	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:20	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:25	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:30	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:35	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:40	2.00	798.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:45	2.01	798.01	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:50	2.02	798.02	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 00:55	2.03	798.03	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:00	2.04	798.04	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:05	2.05	798.05	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:10	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:15	2.06	798.06	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:20	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:25	2.07	798.07	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:30	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:35	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:40	2.08	798.08	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:45	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:50	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 01:55	2.09	798.09	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:00	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:05	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:10	2.10	798.10	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:15	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:20	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:25	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:30	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:35	2.11	798.11	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:40	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:45	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:50	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 02:55	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:00	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:05	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:10	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:15	2.12	798.12	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:20	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:25	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:30	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:35	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:40	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:45	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:50	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 03:55	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:00	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:05	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:10	2.13	798.13	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:20	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:25	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:30	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:35	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:40	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:45	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:50	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 04:55	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:00	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:05	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:10	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:15	2.14	798.14	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 05:20	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:25	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:30	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:35	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:40	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:45	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:50	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 05:55	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:00	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:05	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:10	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:15	2.15	798.15	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:20	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:25	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:30	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:35	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:40	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:45	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:50	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 06:55	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:00	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:05	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:10	2.16	798.16	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:15	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:20	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:25	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:30	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:35	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:40	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:45	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:50	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 07:55	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:00	2.17	798.17	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:05	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:10	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:15	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:20	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:25	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:30	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:35	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:40	2.18	798.18	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:45	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:50	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 08:55	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:00	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:05	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:10	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:15	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:20	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:25	2.19	798.19	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:30	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:35	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:40	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:45	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:50	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 09:55	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:00	2.20	798.20	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:05	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:10	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:15	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:20	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:25	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:30	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:35	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:40	2.21	798.21	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:45	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:50	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 10:55	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 11:00	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:05	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:10	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:15	2.22	798.22	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:20	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:25	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:30	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:35	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:40	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:45	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:50	2.23	798.23	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 11:55	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:00	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:05	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:10	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:15	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:20	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:25	2.24	798.24	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:30	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:35	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:40	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:45	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:50	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 12:55	2.25	798.25	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:00	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:05	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:10	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:15	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:20	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:25	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:30	2.26	798.26	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:35	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:40	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:45	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:50	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 13:55	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:00	2.27	798.27	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:05	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:10	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:15	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:20	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:25	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:30	2.28	798.28	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:35	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:40	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:45	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:50	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 14:55	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:00	2.29	798.29	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:05	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:10	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:15	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:20	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:25	2.30	798.30	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:30	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:35	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:40	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:45	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:50	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 15:55	2.31	798.31	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:00	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:05	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:10	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:15	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:20	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:25	2.32	798.32	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:30	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:35	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 16:40	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:45	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:50	2.33	798.33	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 16:55	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:00	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:05	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:10	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:15	2.34	798.34	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:20	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:25	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:30	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:35	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:40	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:45	2.35	798.35	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:50	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 17:55	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:00	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:05	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:10	2.36	798.36	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:15	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:20	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:25	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:30	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:35	2.37	798.37	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:40	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:45	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:50	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 18:55	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:00	2.38	798.38	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:05	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:10	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:15	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:20	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:25	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:30	2.39	798.39	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:35	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:40	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:45	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:50	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 19:55	2.40	798.40	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:00	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:05	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:10	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:15	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:20	2.41	798.41	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:25	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:30	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:35	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:40	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:45	2.42	798.42	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:50	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 20:55	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:00	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:05	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:10	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:15	2.43	798.43	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:20	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:25	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:30	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:35	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:40	2.44	798.44	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:45	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:50	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 21:55	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:00	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:05	2.45	798.45	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:10	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:15	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/07/03 22:20	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:25	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:30	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:35	2.46	798.46	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:40	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:45	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:50	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 22:55	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:00	2.47	798.47	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:05	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:10	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:15	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:20	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:25	2.48	798.48	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:30	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:35	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:40	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:45	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:50	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/07/03 23:55	2.49	798.49	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:00	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:05	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:10	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:15	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:20	2.50	798.50	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:25	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:30	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:35	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:40	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:45	2.51	798.51	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:50	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 00:55	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:00	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:05	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:10	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:15	2.52	798.52	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:20	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:25	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:30	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:35	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:40	2.53	798.53	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:45	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:50	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 01:55	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:00	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:05	2.54	798.54	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:10	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:15	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:20	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:25	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:30	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:35	2.55	798.55	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:40	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:45	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:50	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 02:55	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:00	2.56	798.56	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:05	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:10	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:15	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:20	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:25	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:30	2.57	798.57	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:35	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:40	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:45	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:50	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 03:55	2.58	798.58	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 04:00	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:05	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:10	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:15	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:20	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:25	2.59	798.59	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:30	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:35	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:40	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:45	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:50	2.60	798.60	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 04:55	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:00	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:05	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:10	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:15	2.61	798.61	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:20	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:25	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:30	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:35	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:40	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:45	2.62	798.62	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:50	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 05:55	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:00	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:05	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:10	2.63	798.63	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:15	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:20	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:25	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:30	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:35	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:40	2.64	798.64	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:45	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:50	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 06:55	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:00	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:05	2.65	798.65	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:10	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:15	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:20	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:25	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:30	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:35	2.66	798.66	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:40	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:45	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:50	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 07:55	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:00	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:05	2.67	798.67	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:10	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:15	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:20	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:25	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:30	2.68	798.68	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:35	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:40	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:45	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:50	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 08:55	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:00	2.69	798.69	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:05	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:10	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:15	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:20	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:25	2.70	798.70	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:30	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:35	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 09:40	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:45	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:50	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 09:55	2.71	798.71	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:00	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:05	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:10	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:15	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:20	2.72	798.72	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:25	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:30	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:35	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:40	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:45	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:50	2.73	798.73	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 10:55	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:00	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:05	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:10	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:15	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:20	2.74	798.74	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:25	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:30	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:35	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:40	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:45	2.75	798.75	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:50	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 11:55	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:00	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:05	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:10	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:15	2.76	798.76	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:20	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:25	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:30	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:35	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:40	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:45	2.77	798.77	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:50	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 12:55	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:00	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:05	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:10	2.78	798.78	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:15	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:20	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:25	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:30	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:35	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:40	2.79	798.79	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:45	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:50	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 13:55	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:00	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:05	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:10	2.80	798.80	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:15	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:20	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:25	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:30	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:35	2.81	798.81	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:40	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:45	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:50	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 14:55	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:00	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:05	2.82	798.82	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:10	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:15	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 15:20	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:25	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:30	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:35	2.83	798.83	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:40	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:45	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:50	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 15:55	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:00	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:05	2.84	798.84	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:10	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:15	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:20	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:25	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:30	2.85	798.85	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:35	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:40	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:45	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:50	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 16:55	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:00	2.86	798.86	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:05	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:10	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:15	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:20	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:25	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:30	2.87	798.87	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:35	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:40	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:45	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:50	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 17:55	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:00	2.88	798.88	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:05	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:10	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:15	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:20	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:25	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:30	2.89	798.89	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:35	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:40	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:45	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:50	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 18:55	2.90	798.90	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:00	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:05	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:10	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:15	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:20	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:25	2.91	798.91	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:30	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:35	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:40	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:45	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:50	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 19:55	2.92	798.92	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:00	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:05	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:10	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:15	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:20	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:25	2.93	798.93	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:30	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:35	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:40	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:45	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:50	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 20:55	2.94	798.94	0.00	0.00	10.00	806.00	0.00	0.00	0.00

10/08/03 21:00	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:05	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:10	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:15	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:20	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:25	2.95	798.95	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:30	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:35	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:40	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:45	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:50	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 21:55	2.96	798.96	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:00	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:05	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:10	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:15	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:20	2.97	798.97	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:25	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:30	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:35	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:40	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:45	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:50	2.98	798.98	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 22:55	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:00	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:05	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:10	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:15	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:20	2.99	798.99	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:25	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:30	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:35	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:40	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:45	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:50	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/08/03 23:55	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/09/03 00:00	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/09/03 00:05	3.00	799.00	0.00	0.00	10.00	806.00	0.00	0.00	0.00
10/09/03 00:10	3.00	799.00	0.00	0.01	10.00	806.00	0.00	0.00	0.00
10/09/03 00:15	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/09/03 00:20	3.00	799.00	0.01	0.01	10.00	806.00	0.00	0.00	0.00
10/09/03 00:25	3.00	799.00	0.01	0.02	10.00	806.00	0.00	0.00	1.20
10/09/03 00:30	3.00	799.00	0.01	0.02	10.00	806.00	0.00	0.01	1.25
10/09/03 00:35	3.00	799.00	0.02	0.03	10.00	806.00	0.00	0.01	1.30
10/09/03 00:40	3.00	799.00	0.02	0.03	10.00	806.00	0.00	0.01	1.35
10/09/03 00:45	3.00	799.00	0.02	0.03	10.01	806.01	0.01	0.01	1.39
10/09/03 00:50	3.00	799.00	0.03	0.04	10.01	806.01	0.01	0.01	1.43
10/09/03 00:55	3.00	799.00	0.03	0.04	10.01	806.01	0.01	0.01	1.46
10/09/03 01:00	3.00	799.00	0.03	0.05	10.01	806.01	0.01	0.01	1.49
10/09/03 01:05	3.00	799.00	0.03	0.05	10.01	806.01	0.01	0.01	1.52
10/09/03 01:10	3.00	799.00	0.04	0.06	10.01	806.01	0.01	0.01	1.55
10/09/03 01:15	3.00	799.00	0.04	0.06	10.01	806.01	0.01	0.02	1.57
10/09/03 01:20	3.00	799.00	0.04	0.07	10.01	806.01	0.01	0.02	1.59
10/09/03 01:25	3.00	799.00	0.05	0.07	10.01	806.01	0.01	0.02	1.62
10/09/03 01:30	3.00	799.00	0.05	0.08	10.01	806.01	0.01	0.02	1.63
10/09/03 01:35	3.00	799.00	0.05	0.08	10.01	806.01	0.01	0.02	1.65
10/09/03 01:40	3.00	799.00	0.05	0.08	10.01	806.01	0.01	0.02	1.67
10/09/03 01:45	3.00	799.00	0.06	0.09	10.01	806.01	0.01	0.02	1.68
10/09/03 01:50	3.00	799.00	0.06	0.09	10.01	806.01	0.02	0.02	1.70
10/09/03 01:55	3.00	799.00	0.06	0.09	10.01	806.01	0.02	0.03	1.71
10/09/03 02:00	3.00	799.00	0.06	0.09	10.01	806.01	0.02	0.03	1.72
10/09/03 02:05	3.00	799.00	0.06	0.10	10.01	806.01	0.02	0.03	1.73
10/09/03 02:10	3.00	799.00	0.06	0.10	10.01	806.01	0.02	0.03	1.74
10/09/03 02:15	3.00	799.00	0.06	0.10	10.01	806.01	0.02	0.03	1.75
10/09/03 02:20	3.00	799.00	0.07	0.10	10.01	806.01	0.02	0.03	1.76
10/09/03 02:25	3.00	799.00	0.07	0.10	10.01	806.01	0.02	0.03	1.77
10/09/03 02:30	3.00	799.00	0.07	0.10	10.01	806.01	0.02	0.03	1.77
10/09/03 02:35	3.00	799.00	0.07	0.11	10.01	806.01	0.02	0.04	1.78

10/09/03 02:40	3.00	799.00	0.07	0.11	10.01	806.01	0.02	0.04	1.79
10/09/03 02:45	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.04	1.79
10/09/03 02:50	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.04	1.80
10/09/03 02:55	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.04	1.80
10/09/03 03:00	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.04	1.81
10/09/03 03:05	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.04	1.81
10/09/03 03:10	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.05	1.81
10/09/03 03:15	3.00	799.00	0.07	0.11	10.01	806.01	0.03	0.05	1.80
10/09/03 03:20	3.00	799.00	0.07	0.11	10.02	806.02	0.03	0.05	1.80
10/09/03 03:25	3.00	799.00	0.07	0.11	10.02	806.02	0.03	0.05	1.80
10/09/03 03:30	3.00	799.00	0.07	0.11	10.02	806.02	0.03	0.05	1.80
10/09/03 03:35	3.00	799.00	0.07	0.11	10.02	806.02	0.03	0.05	1.80
10/09/03 03:40	3.00	799.00	0.07	0.11	10.02	806.02	0.03	0.05	1.80
10/09/03 03:45	3.00	799.00	0.07	0.11	10.02	806.02	0.03	0.05	1.80
10/09/03 03:50	3.00	799.00	0.07	0.11	10.02	806.02	0.04	0.05	1.80
10/09/03 03:55	3.00	799.00	0.07	0.11	10.02	806.02	0.04	0.06	1.80
10/09/03 04:00	3.00	799.00	0.07	0.11	10.02	806.02	0.04	0.06	1.80
10/09/03 04:05	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:10	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:15	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:20	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:25	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:30	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.80
10/09/03 04:35	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.06	1.81
10/09/03 04:40	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:45	3.00	799.00	0.07	0.12	10.02	806.02	0.04	0.07	1.82
10/09/03 04:50	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.83
10/09/03 04:55	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.84
10/09/03 05:00	3.00	799.00	0.08	0.12	10.02	806.02	0.04	0.07	1.85
10/09/03 05:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.85
10/09/03 05:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.86
10/09/03 05:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.87
10/09/03 05:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.88
10/09/03 05:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.07	1.89
10/09/03 05:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:40	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.90
10/09/03 05:45	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:50	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.91
10/09/03 05:55	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.92
10/09/03 06:00	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:05	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.93
10/09/03 06:10	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:15	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.94
10/09/03 06:20	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:25	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.95
10/09/03 06:30	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:35	3.00	799.00	0.08	0.12	10.02	806.02	0.05	0.08	1.96
10/09/03 06:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.97
10/09/03 06:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 06:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.98
10/09/03 07:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	1.99
10/09/03 07:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.00
10/09/03 07:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.01
10/09/03 07:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.02
10/09/03 07:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.09	2.03
10/09/03 08:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.03
10/09/03 08:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:15	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04

10/09/03 08:20	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:25	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.04
10/09/03 08:30	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:35	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:40	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.05
10/09/03 08:45	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:50	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 08:55	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:00	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.06
10/09/03 09:05	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:10	3.00	799.00	0.08	0.12	10.02	806.02	0.06	0.10	2.07
10/09/03 09:15	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:20	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:25	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.07
10/09/03 09:30	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:35	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:40	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:45	3.00	799.00	0.08	0.12	10.02	806.02	0.07	0.10	2.08
10/09/03 09:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.08
10/09/03 09:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.09
10/09/03 10:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.10	2.10
10/09/03 10:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.10
10/09/03 10:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.11
10/09/03 11:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 11:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.12
10/09/03 12:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 12:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.13
10/09/03 13:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 13:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14

10/09/03 14:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.14
10/09/03 14:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 15:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 16:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.11	2.15
10/09/03 17:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.15
10/09/03 17:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 17:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 18:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16

10/09/03 19:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 19:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:00	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:05	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:10	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:15	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:20	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:25	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:30	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:35	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:40	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:45	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:50	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 20:55	3.00	799.00	0.08	0.12	10.03	806.03	0.07	0.12	2.16
10/09/03 21:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 21:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 22:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/09/03 23:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:20	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:25	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:30	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:35	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:40	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:45	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:50	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 00:55	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:00	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:05	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.16
10/10/03 01:10	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17
10/10/03 01:15	3.00	799.00	0.08	0.12	10.03	806.03	0.08	0.12	2.17

10/10/03 01:20	3.00	799.00	0.08	0.13	10.03	806.03	0.08	0.12	2.18
10/10/03 01:25	3.00	799.00	0.09	0.14	10.03	806.03	0.08	0.12	2.20
10/10/03 01:30	3.00	799.00	0.09	0.15	10.03	806.03	0.08	0.13	2.21
10/10/03 01:35	3.00	799.00	0.10	0.16	10.03	806.03	0.08	0.13	2.23
10/10/03 01:40	3.00	799.00	0.11	0.17	10.03	806.03	0.09	0.13	2.25
10/10/03 01:45	3.00	799.00	0.12	0.18	10.03	806.03	0.09	0.14	2.27
10/10/03 01:50	3.00	799.00	0.12	0.19	10.03	806.03	0.09	0.14	2.29
10/10/03 01:55	3.00	799.00	0.13	0.20	10.03	806.03	0.09	0.15	2.32
10/10/03 02:00	3.00	799.00	0.14	0.22	10.03	806.03	0.10	0.15	2.34
10/10/03 02:05	3.00	799.00	0.15	0.23	10.03	806.03	0.10	0.16	2.36
10/10/03 02:10	3.00	799.00	0.16	0.24	10.03	806.03	0.10	0.16	2.39
10/10/03 02:15	3.00	799.00	0.17	0.26	10.03	806.03	0.11	0.17	2.41
10/10/03 02:20	3.00	799.00	0.18	0.27	10.04	806.04	0.11	0.17	2.43
10/10/03 02:25	3.00	799.00	0.18	0.28	10.04	806.04	0.12	0.18	2.45
10/10/03 02:30	3.00	799.00	0.19	0.30	10.04	806.04	0.12	0.19	2.48
10/10/03 02:35	3.00	799.00	0.20	0.31	10.04	806.04	0.12	0.19	2.50
10/10/03 02:40	3.00	799.00	0.21	0.33	10.04	806.04	0.13	0.20	2.53
10/10/03 02:45	3.00	799.00	0.22	0.34	10.04	806.04	0.13	0.21	2.55
10/10/03 02:50	3.00	799.00	0.23	0.36	10.04	806.04	0.14	0.21	2.58
10/10/03 02:55	3.00	799.00	0.24	0.37	10.04	806.04	0.14	0.22	2.60
10/10/03 03:00	3.00	799.00	0.25	0.39	10.04	806.04	0.15	0.23	2.63
10/10/03 03:05	3.00	799.00	0.26	0.40	10.04	806.04	0.15	0.24	2.66
10/10/03 03:10	3.00	799.00	0.27	0.42	10.05	806.05	0.16	0.25	2.69
10/10/03 03:15	3.00	799.00	0.28	0.43	10.05	806.05	0.17	0.26	2.72
10/10/03 03:20	3.00	799.00	0.29	0.45	10.05	806.05	0.17	0.26	2.75
10/10/03 03:25	3.00	799.00	0.30	0.47	10.05	806.05	0.18	0.27	2.78
10/10/03 03:30	3.00	799.00	0.31	0.48	10.05	806.05	0.18	0.28	2.81
10/10/03 03:35	3.00	799.00	0.32	0.50	10.05	806.05	0.19	0.29	2.84
10/10/03 03:40	3.00	799.00	0.33	0.51	10.05	806.05	0.20	0.30	2.87
10/10/03 03:45	3.00	799.00	0.34	0.53	10.05	806.05	0.20	0.32	2.91
10/10/03 03:50	3.01	799.01	0.35	0.54	10.05	806.05	0.21	0.33	2.94
10/10/03 03:55	3.01	799.01	0.36	0.56	10.06	806.06	0.22	0.34	2.97
10/10/03 04:00	3.01	799.01	0.37	0.57	10.06	806.06	0.23	0.35	3.00
10/10/03 04:05	3.01	799.01	0.38	0.58	10.06	806.06	0.23	0.36	3.03
10/10/03 04:10	3.01	799.01	0.39	0.60	10.06	806.06	0.24	0.37	3.06
10/10/03 04:15	3.01	799.01	0.40	0.61	10.06	806.06	0.25	0.38	3.09
10/10/03 04:20	3.01	799.01	0.40	0.63	10.06	806.06	0.26	0.40	3.12
10/10/03 04:25	3.01	799.01	0.41	0.64	10.06	806.06	0.26	0.41	3.14
10/10/03 04:30	3.01	799.01	0.42	0.65	10.06	806.06	0.27	0.42	3.17
10/10/03 04:35	3.01	799.01	0.43	0.67	10.07	806.07	0.28	0.43	3.19
10/10/03 04:40	3.01	799.01	0.44	0.68	10.07	806.07	0.29	0.45	3.22
10/10/03 04:45	3.01	799.01	0.45	0.70	10.07	806.07	0.30	0.46	3.25
10/10/03 04:50	3.01	799.01	0.46	0.72	10.07	806.07	0.31	0.47	3.28
10/10/03 04:55	3.01	799.01	0.47	0.73	10.07	806.07	0.31	0.49	3.30
10/10/03 05:00	3.01	799.01	0.48	0.75	10.07	806.07	0.32	0.50	3.33
10/10/03 05:05	3.01	799.01	0.49	0.76	10.07	806.07	0.33	0.51	3.36
10/10/03 05:10	3.01	799.01	0.50	0.77	10.07	806.07	0.34	0.53	3.39
10/10/03 05:15	3.01	799.01	0.50	0.78	10.08	806.08	0.35	0.54	3.41
10/10/03 05:20	3.01	799.01	0.51	0.80	10.08	806.08	0.36	0.55	3.44
10/10/03 05:25	3.01	799.01	0.53	0.81	10.08	806.08	0.37	0.57	3.46
10/10/03 05:30	3.01	799.01	0.54	0.83	10.08	806.08	0.38	0.58	3.49
10/10/03 05:35	3.01	799.01	0.55	0.85	10.08	806.08	0.39	0.60	3.52
10/10/03 05:40	3.01	799.01	0.56	0.87	10.08	806.08	0.40	0.61	3.55
10/10/03 05:45	3.01	799.01	0.57	0.88	10.08	806.08	0.41	0.63	3.57
10/10/03 05:50	3.01	799.01	0.58	0.90	10.09	806.09	0.42	0.65	3.60
10/10/03 05:55	3.01	799.01	0.59	0.91	10.09	806.09	0.43	0.66	3.63
10/10/03 06:00	3.01	799.01	0.60	0.93	10.09	806.09	0.44	0.68	3.65
10/10/03 06:05	3.01	799.01	0.61	0.95	10.09	806.09	0.45	0.69	3.68
10/10/03 06:10	3.01	799.01	0.63	0.97	10.09	806.09	0.46	0.71	3.70
10/10/03 06:15	3.01	799.01	0.64	0.99	10.09	806.09	0.47	0.73	3.72
10/10/03 06:20	3.01	799.01	0.65	1.01	10.09	806.09	0.48	0.74	3.75
10/10/03 06:25	3.01	799.01	0.67	1.03	10.10	806.10	0.49	0.76	3.77
10/10/03 06:30	3.01	799.01	0.68	1.06	10.10	806.10	0.50	0.78	3.80
10/10/03 06:35	3.01	799.01	0.70	1.08	10.10	806.10	0.52	0.80	3.83
10/10/03 06:40	3.01	799.01	0.72	1.11	10.10	806.10	0.53	0.82	3.86
10/10/03 06:45	3.01	799.01	0.74	1.14	10.10	806.10	0.54	0.84	3.89
10/10/03 06:50	3.01	799.01	0.76	1.18	10.10	806.10	0.56	0.86	3.92
10/10/03 06:55	3.01	799.01	0.78	1.21	10.11	806.11	0.57	0.88	3.95

10/10/03 07:00	3.01	799.01	0.80	1.24	10.11	806.11	0.59	0.91	3.98
10/10/03 07:05	3.01	799.01	0.83	1.28	10.11	806.11	0.60	0.93	4.01
10/10/03 07:10	3.01	799.01	0.85	1.32	10.11	806.11	0.62	0.95	4.04
10/10/03 07:15	3.01	799.01	0.87	1.35	10.11	806.11	0.63	0.98	4.07
10/10/03 07:20	3.01	799.01	0.89	1.38	10.11	806.11	0.65	1.00	4.11
10/10/03 07:25	3.01	799.01	0.91	1.41	10.12	806.12	0.67	1.03	4.14
10/10/03 07:30	3.01	799.01	0.93	1.44	10.12	806.12	0.68	1.06	4.17
10/10/03 07:35	3.01	799.01	0.95	1.47	10.12	806.12	0.70	1.08	4.20
10/10/03 07:40	3.01	799.01	0.96	1.49	10.12	806.12	0.72	1.11	4.23
10/10/03 07:45	3.01	799.01	0.98	1.52	10.12	806.12	0.73	1.14	4.25
10/10/03 07:50	3.01	799.01	0.99	1.54	10.13	806.13	0.75	1.16	4.28
10/10/03 07:55	3.01	799.01	1.01	1.56	10.13	806.13	0.77	1.19	4.30
10/10/03 08:00	3.01	799.01	1.02	1.58	10.13	806.13	0.78	1.21	4.32
10/10/03 08:05	3.01	799.01	1.04	1.60	10.13	806.13	0.80	1.24	4.35
10/10/03 08:10	3.01	799.01	1.05	1.63	10.13	806.13	0.82	1.27	4.37
10/10/03 08:15	3.01	799.01	1.07	1.65	10.14	806.14	0.84	1.29	4.39
10/10/03 08:20	3.01	799.01	1.09	1.68	10.14	806.14	0.85	1.32	4.42
10/10/03 08:25	3.01	799.01	1.11	1.71	10.14	806.14	0.87	1.35	4.44
10/10/03 08:30	3.01	799.01	1.12	1.74	10.14	806.14	0.89	1.38	4.47
10/10/03 08:35	3.01	799.01	1.14	1.77	10.14	806.14	0.91	1.41	4.50
10/10/03 08:40	3.01	799.01	1.17	1.80	10.15	806.15	0.93	1.44	4.53
10/10/03 08:45	3.01	799.01	1.19	1.83	10.15	806.15	0.95	1.47	4.56
10/10/03 08:50	3.01	799.01	1.21	1.87	10.15	806.15	0.97	1.50	4.59
10/10/03 08:55	3.01	799.01	1.23	1.91	10.15	806.15	0.99	1.53	4.62
10/10/03 09:00	3.01	799.01	1.26	1.95	10.15	806.15	1.01	1.56	4.65
10/10/03 09:05	3.01	799.01	1.28	1.99	10.16	806.16	1.03	1.60	4.67
10/10/03 09:10	3.01	799.01	1.31	2.03	10.16	806.16	1.05	1.63	4.70
10/10/03 09:15	3.01	799.01	1.32	2.05	10.16	806.16	1.07	1.66	4.73
10/10/03 09:20	3.01	799.01	1.35	2.09	10.16	806.16	1.10	1.70	4.75
10/10/03 09:25	3.01	799.01	1.38	2.13	10.16	806.16	1.12	1.73	4.78
10/10/03 09:30	3.01	799.01	1.40	2.17	10.17	806.17	1.14	1.77	4.81
10/10/03 09:35	3.01	799.01	1.43	2.22	10.17	806.17	1.17	1.80	4.83
10/10/03 09:40	3.01	799.01	1.46	2.26	10.17	806.17	1.19	1.84	4.86
10/10/03 09:45	3.01	799.01	1.49	2.30	10.17	806.17	1.21	1.88	4.89
10/10/03 09:50	3.01	799.01	1.52	2.35	10.18	806.18	1.24	1.92	4.91
10/10/03 09:55	3.01	799.01	1.55	2.40	10.18	806.18	1.27	1.96	4.94
10/10/03 10:00	3.01	799.01	1.58	2.45	10.18	806.18	1.29	2.00	4.97
10/10/03 10:05	3.01	799.01	1.62	2.51	10.18	806.18	1.32	2.05	5.00
10/10/03 10:10	3.01	799.01	1.66	2.57	10.19	806.19	1.35	2.09	5.03
10/10/03 10:15	3.01	799.01	1.70	2.63	10.19	806.19	1.38	2.14	5.07
10/10/03 10:20	3.01	799.01	1.75	2.70	10.19	806.19	1.41	2.19	5.10
10/10/03 10:25	3.01	799.01	1.79	2.78	10.20	806.20	1.45	2.24	5.13
10/10/03 10:30	3.01	799.01	1.84	2.85	10.20	806.20	1.48	2.30	5.17
10/10/03 10:35	3.02	799.02	1.90	2.94	10.20	806.20	1.52	2.36	5.20
10/10/03 10:40	3.02	799.02	1.97	3.04	10.21	806.21	1.56	2.42	5.24
10/10/03 10:45	3.02	799.02	2.03	3.14	10.21	806.21	1.61	2.49	5.28
10/10/03 10:50	3.02	799.02	2.10	3.25	10.21	806.21	1.65	2.56	5.32
10/10/03 10:55	3.02	799.02	2.18	3.37	10.22	806.22	1.70	2.63	5.36
10/10/03 11:00	3.02	799.02	2.25	3.48	10.22	806.22	1.75	2.71	5.41
10/10/03 11:05	3.02	799.02	2.35	3.63	10.23	806.23	1.81	2.80	5.45
10/10/03 11:10	3.02	799.02	2.46	3.80	10.23	806.23	1.87	2.90	5.50
10/10/03 11:15	3.02	799.02	2.56	3.96	10.24	806.24	1.94	3.00	5.55
10/10/03 11:20	3.02	799.02	2.68	4.15	10.24	806.24	2.01	3.12	5.61
10/10/03 11:25	3.02	799.02	2.83	4.38	10.25	806.25	2.09	3.24	5.67
10/10/03 11:30	3.02	799.02	3.01	4.66	10.26	806.26	2.19	3.38	5.74
10/10/03 11:35	3.03	799.03	3.85	5.96	10.27	806.27	2.36	3.65	5.85
10/10/03 11:40	3.04	799.04	5.66	8.76	10.30	806.30	2.70	4.18	6.06
10/10/03 11:45	3.05	799.05	9.41	14.56	10.35	806.35	3.28	5.08	6.36
10/10/03 11:50	3.09	799.09	21.13	32.69	10.45	806.45	4.69	7.26	6.93
10/10/03 11:55	3.13	799.13	39.77	61.54	10.66	806.66	8.16	12.63	7.89
10/10/03 12:00	3.23	799.23	109.42	169.29	11.13	807.13	16.90	26.15	9.19
10/10/03 12:05	3.31	799.31	181.30	280.51	11.87	807.87	22.06	34.13	9.30
10/10/03 12:10	3.34	799.34	212.40	328.63	12.72	808.72	25.94	40.13	8.18
10/10/03 12:15	3.32	799.32	195.72	302.82	13.45	809.45	29.94	46.33	9.44
10/10/03 12:20	3.30	799.30	175.03	270.80	14.04	810.04	30.50	47.18	9.61
10/10/03 12:25	3.27	799.27	155.66	240.84	14.53	810.53	30.95	47.89	9.76
10/10/03 12:30	3.25	799.25	138.20	213.82	14.92	810.92	31.32	48.45	9.87
10/10/03 12:35	3.24	799.24	124.49	192.61	15.25	811.25	31.62	48.92	9.97

10/10/03 12:40	3.22	799.22	114.94	177.84	15.54	811.54	31.88	49.33	10.05
10/10/03 12:45	3.20	799.20	101.91	157.68	15.79	811.79	32.11	49.67	10.12
10/10/03 12:50	3.19	799.19	91.93	142.24	16.00	812.00	32.29	49.96	10.18
10/10/03 12:55	3.23	799.23	85.24	131.88	16.17	812.17	32.44	50.20	10.23
10/10/03 13:00	3.33	799.33	78.08	120.80	16.31	812.31	32.57	50.39	10.27
10/10/03 13:05	3.43	799.43	65.42	101.21	16.42	812.42	32.67	50.54	10.30
10/10/03 13:10	3.51	799.51	57.55	89.04	16.51	812.51	32.75	50.67	10.32
10/10/03 13:15	3.58	799.58	50.80	78.60	16.58	812.58	32.81	50.76	10.34
10/10/03 13:20	3.64	799.64	46.76	72.35	16.64	812.64	32.86	50.84	10.36
10/10/03 13:25	3.68	799.68	42.28	65.42	16.68	812.68	32.90	50.90	10.37
10/10/03 13:30	3.71	799.71	39.23	60.70	16.71	812.71	32.92	50.94	10.38
10/10/03 13:35	3.73	799.73	36.84	57.00	16.73	812.73	32.94	50.97	10.38
10/10/03 13:40	3.75	799.75	34.80	53.85	16.75	812.75	32.96	50.99	10.39
10/10/03 13:45	3.76	799.76	33.14	51.28	16.76	812.76	32.96	51.00	10.39
10/10/03 13:50	3.76	799.76	31.17	48.23	16.76	812.76	32.97	51.01	10.39
10/10/03 13:55	3.76	799.76	29.62	45.83	16.76	812.76	32.97	51.00	10.39
10/10/03 14:00	3.75	799.75	28.23	43.68	16.75	812.75	32.96	50.99	10.39
10/10/03 14:05	3.74	799.74	27.03	41.82	16.74	812.74	32.95	50.98	10.39
10/10/03 14:10	3.72	799.72	25.94	40.13	16.72	812.72	32.94	50.96	10.38
10/10/03 14:15	3.71	799.71	25.00	38.68	16.71	812.71	32.92	50.94	10.38
10/10/03 14:20	3.69	799.69	24.22	37.48	16.69	812.69	32.90	50.91	10.37
10/10/03 14:25	3.66	799.66	23.45	36.28	16.66	812.66	32.88	50.88	10.36
10/10/03 14:30	3.64	799.64	22.71	35.14	16.64	812.64	32.86	50.84	10.36
10/10/03 14:35	3.61	799.61	22.05	34.11	16.61	812.61	32.84	50.81	10.35
10/10/03 14:40	3.58	799.58	21.41	33.12	16.58	812.58	32.81	50.76	10.34
10/10/03 14:45	3.55	799.55	20.96	32.43	16.55	812.55	32.78	50.72	10.33
10/10/03 14:50	3.52	799.52	20.33	31.46	16.52	812.52	32.75	50.68	10.32
10/10/03 14:55	3.48	799.48	19.76	30.57	16.48	812.48	32.72	50.63	10.31
10/10/03 15:00	3.44	799.44	19.27	29.82	16.44	812.44	32.69	50.58	10.30
10/10/03 15:05	3.41	799.41	18.77	29.04	16.41	812.41	32.66	50.53	10.29
10/10/03 15:10	3.37	799.37	17.92	27.73	16.37	812.37	32.62	50.47	10.28
10/10/03 15:15	3.32	799.32	16.99	26.29	16.32	812.32	32.58	50.41	10.27
10/10/03 15:20	3.28	799.28	16.17	25.02	16.28	812.28	32.54	50.35	10.26
10/10/03 15:25	3.23	799.23	15.32	23.70	16.23	812.23	32.50	50.29	10.25
10/10/03 15:30	3.18	799.18	14.35	22.21	16.18	812.18	32.46	50.22	10.23
10/10/03 15:35	3.14	799.14	13.38	20.70	16.13	812.13	32.42	50.16	10.22
10/10/03 15:40	3.09	799.09	12.30	19.03	16.08	812.08	32.37	50.08	10.20
10/10/03 15:45	3.06	799.06	11.90	18.41	16.03	812.03	32.32	50.01	10.19
10/10/03 15:50	3.05	799.05	11.54	17.85	15.97	811.97	32.27	49.93	10.17
10/10/03 15:55	3.05	799.05	11.21	17.34	15.90	811.90	32.22	49.84	10.15
10/10/03 16:00	3.05	799.05	10.87	16.82	15.84	811.84	32.16	49.76	10.14
10/10/03 16:05	3.05	799.05	10.54	16.31	15.78	811.78	32.10	49.67	10.12
10/10/03 16:10	3.04	799.04	10.20	15.78	15.71	811.71	32.04	49.58	10.10
10/10/03 16:15	3.04	799.04	9.89	15.31	15.64	811.64	31.98	49.48	10.08
10/10/03 16:20	3.04	799.04	9.62	14.88	15.57	811.57	31.92	49.39	10.06
10/10/03 16:25	3.04	799.04	9.37	14.49	15.51	811.51	31.86	49.30	10.04
10/10/03 16:30	3.04	799.04	9.14	14.14	15.44	811.44	31.80	49.20	10.02
10/10/03 16:35	3.04	799.04	8.90	13.77	15.37	811.37	31.74	49.10	10.00
10/10/03 16:40	3.04	799.04	8.67	13.41	15.30	811.30	31.67	49.00	9.98
10/10/03 16:45	3.04	799.04	8.44	13.05	15.22	811.22	31.61	48.90	9.96
10/10/03 16:50	3.04	799.04	8.20	12.68	15.15	811.15	31.54	48.80	9.94
10/10/03 16:55	3.04	799.04	7.97	12.33	15.08	811.08	31.47	48.70	9.92
10/10/03 17:00	3.04	799.04	7.76	12.01	15.00	811.00	31.41	48.59	9.90
10/10/03 17:05	3.04	799.04	7.57	11.72	14.93	810.93	31.34	48.49	9.88
10/10/03 17:10	3.04	799.04	7.40	11.46	14.85	810.85	31.27	48.38	9.86
10/10/03 17:15	3.04	799.04	7.25	11.21	14.77	810.77	31.20	48.27	9.83
10/10/03 17:20	3.03	799.03	7.10	10.98	14.69	810.69	31.13	48.16	9.81
10/10/03 17:25	3.03	799.03	6.95	10.76	14.62	810.62	31.05	48.04	9.79
10/10/03 17:30	3.03	799.03	6.81	10.54	14.53	810.53	30.98	47.93	9.76
10/10/03 17:35	3.03	799.03	6.67	10.32	14.45	810.45	30.90	47.81	9.74
10/10/03 17:40	3.03	799.03	6.53	10.11	14.37	810.37	30.83	47.70	9.72
10/10/03 17:45	3.03	799.03	6.43	9.95	14.29	810.29	30.75	47.58	9.69
10/10/03 17:50	3.03	799.03	6.28	9.71	14.20	810.20	30.67	47.46	9.67
10/10/03 17:55	3.03	799.03	6.15	9.51	14.12	810.12	30.59	47.33	9.64
10/10/03 18:00	3.03	799.03	6.03	9.33	14.03	810.03	30.51	47.21	9.62
10/10/03 18:05	3.03	799.03	5.92	9.16	13.94	809.94	30.43	47.08	9.59
10/10/03 18:10	3.03	799.03	5.81	9.00	13.86	809.86	30.35	46.95	9.57
10/10/03 18:15	3.03	799.03	5.71	8.83	13.77	809.77	30.26	46.82	9.54

10/10/03 18:20	3.03	799.03	5.60	8.67	13.68	809.68	30.18	46.69	9.51
10/10/03 18:25	3.03	799.03	5.51	8.52	13.59	809.59	30.09	46.56	9.49
10/10/03 18:30	3.03	799.03	5.42	8.39	13.50	809.50	30.01	46.42	9.46
10/10/03 18:35	3.03	799.03	5.35	8.28	13.40	809.40	29.92	46.29	9.43
10/10/03 18:40	3.03	799.03	5.27	8.16	13.31	809.31	29.83	46.15	9.40
10/10/03 18:45	3.03	799.03	5.19	8.04	13.22	809.22	29.72	45.98	9.37
10/10/03 18:50	3.03	799.03	5.10	7.90	13.12	809.12	29.29	45.32	9.23
10/10/03 18:55	3.03	799.03	5.01	7.74	13.03	809.03	28.85	44.64	9.09
10/10/03 19:00	3.03	799.03	4.91	7.60	12.93	808.93	28.40	43.94	8.95
10/10/03 19:05	3.03	799.03	4.82	7.46	12.84	808.84	27.95	43.24	8.81
10/10/03 19:10	3.03	799.03	4.73	7.31	12.75	808.75	27.49	42.53	8.66
10/10/03 19:15	3.03	799.03	4.63	7.16	12.65	808.65	27.02	41.80	8.52
10/10/03 19:20	3.03	799.03	4.53	7.01	12.56	808.56	26.55	41.08	8.37
10/10/03 19:25	3.03	799.03	4.43	6.86	12.47	808.47	26.09	40.37	8.22
10/10/03 19:30	3.03	799.03	4.34	6.72	12.38	808.38	25.89	40.06	8.19
10/10/03 19:35	3.02	799.02	4.25	6.58	12.28	808.28	25.08	38.81	8.36
10/10/03 19:40	3.02	799.02	4.17	6.45	12.19	808.19	24.57	38.02	8.44
10/10/03 19:45	3.02	799.02	4.08	6.31	12.10	808.10	24.05	37.22	8.54
10/10/03 19:50	3.02	799.02	4.00	6.18	12.01	808.01	23.53	36.41	8.75
10/10/03 19:55	3.02	799.02	3.92	6.06	11.92	807.92	22.99	35.57	8.97
10/10/03 20:00	3.02	799.02	3.84	5.94	11.83	807.83	22.45	34.73	9.10
10/10/03 20:05	3.02	799.02	3.77	5.83	11.74	807.74	21.90	33.88	9.21
10/10/03 20:10	3.02	799.02	3.70	5.72	11.66	807.66	21.35	33.04	9.32
10/10/03 20:15	3.02	799.02	3.63	5.62	11.57	807.57	20.80	32.19	9.43
10/10/03 20:20	3.02	799.02	3.57	5.52	11.49	807.49	20.26	31.34	9.53
10/10/03 20:25	3.02	799.02	3.51	5.44	11.41	807.41	19.73	30.52	9.49
10/10/03 20:30	3.02	799.02	3.46	5.36	11.33	807.33	19.17	29.66	9.45
10/10/03 20:35	3.02	799.02	3.42	5.30	11.25	807.25	18.61	28.80	9.40
10/10/03 20:40	3.02	799.02	3.38	5.22	11.18	807.18	18.06	27.93	9.35
10/10/03 20:45	3.02	799.02	3.32	5.13	11.11	807.11	17.50	27.07	9.29
10/10/03 20:50	3.02	799.02	3.25	5.03	11.04	807.04	16.93	26.20	9.24
10/10/03 20:55	3.02	799.02	3.19	4.93	10.97	806.97	16.31	25.24	9.18
10/10/03 21:00	3.02	799.02	3.12	4.83	10.91	806.91	14.75	22.82	9.01
10/10/03 21:05	3.02	799.02	3.06	4.74	10.85	806.85	13.40	20.73	8.84
10/10/03 21:10	3.02	799.02	3.01	4.66	10.80	806.80	12.23	18.92	8.68
10/10/03 21:15	3.02	799.02	2.96	4.58	10.75	806.75	11.21	17.34	8.52
10/10/03 21:20	3.02	799.02	2.92	4.51	10.71	806.71	10.31	15.96	8.37
10/10/03 21:25	3.02	799.02	2.88	4.45	10.68	806.68	9.53	14.75	8.23
10/10/03 21:30	3.02	799.02	2.84	4.39	10.65	806.65	8.84	13.68	8.10
10/10/03 21:35	3.02	799.02	2.80	4.33	10.62	806.62	8.23	12.74	7.97
10/10/03 21:40	3.02	799.02	2.76	4.28	10.59	806.59	7.69	11.90	7.85
10/10/03 21:45	3.02	799.02	2.73	4.23	10.56	806.56	7.21	11.16	7.73
10/10/03 21:50	3.02	799.02	2.70	4.18	10.54	806.54	6.78	10.49	7.62
10/10/03 21:55	3.02	799.02	2.67	4.13	10.52	806.52	6.40	9.90	7.52
10/10/03 22:00	3.02	799.02	2.64	4.08	10.50	806.50	6.05	9.36	7.42
10/10/03 22:05	3.02	799.02	2.61	4.04	10.48	806.48	5.74	8.88	7.33
10/10/03 22:10	3.02	799.02	2.59	4.00	10.47	806.47	5.46	8.44	7.24
10/10/03 22:15	3.02	799.02	2.56	3.96	10.45	806.45	5.20	8.05	7.16
10/10/03 22:20	3.02	799.02	2.54	3.92	10.44	806.44	4.97	7.69	7.08
10/10/03 22:25	3.02	799.02	2.51	3.89	10.43	806.43	4.76	7.36	7.00
10/10/03 22:30	3.02	799.02	2.49	3.85	10.42	806.42	4.57	7.07	6.93
10/10/03 22:35	3.02	799.02	2.47	3.82	10.41	806.41	4.39	6.80	6.87
10/10/03 22:40	3.02	799.02	2.45	3.79	10.40	806.40	4.23	6.55	6.80
10/10/03 22:45	3.02	799.02	2.43	3.76	10.39	806.39	4.09	6.32	6.74
10/10/03 22:50	3.02	799.02	2.41	3.73	10.38	806.38	3.95	6.11	6.69
10/10/03 22:55	3.02	799.02	2.39	3.70	10.37	806.37	3.83	5.92	6.64
10/10/03 23:00	3.02	799.02	2.37	3.67	10.36	806.36	3.71	5.74	6.58
10/10/03 23:05	3.02	799.02	2.36	3.65	10.36	806.36	3.61	5.58	6.53
10/10/03 23:10	3.02	799.02	2.34	3.63	10.35	806.35	3.51	5.43	6.49
10/10/03 23:15	3.02	799.02	2.33	3.60	10.34	806.34	3.42	5.29	6.45
10/10/03 23:20	3.02	799.02	2.32	3.58	10.34	806.34	3.33	5.16	6.41
10/10/03 23:25	3.02	799.02	2.30	3.56	10.33	806.33	3.26	5.04	6.37
10/10/03 23:30	3.02	799.02	2.29	3.54	10.33	806.33	3.18	4.93	6.33
10/10/03 23:35	3.02	799.02	2.27	3.52	10.32	806.32	3.12	4.82	6.29
10/10/03 23:40	3.02	799.02	2.26	3.50	10.32	806.32	3.05	4.72	6.26
10/10/03 23:45	3.02	799.02	2.25	3.48	10.32	806.32	3.00	4.63	6.23
10/10/03 23:50	3.02	799.02	2.24	3.46	10.31	806.31	2.94	4.55	6.20
10/10/03 23:55	3.02	799.02	2.22	3.44	10.31	806.31	2.89	4.47	6.17

10/11/03 00:00	3.02	799.02	2.21	3.43	10.30	806.30	2.84	4.40	6.15
10/11/03 00:05	3.02	799.02	2.19	3.39	10.30	806.30	2.79	4.32	6.12
10/11/03 00:10	3.02	799.02	2.15	3.33	10.30	806.30	2.75	4.25	6.10
10/11/03 00:15	3.02	799.02	2.11	3.26	10.29	806.29	2.70	4.18	6.07
10/11/03 00:20	3.02	799.02	2.07	3.20	10.29	806.29	2.65	4.10	6.04
10/11/03 00:25	3.02	799.02	2.03	3.15	10.29	806.29	2.60	4.03	6.01
10/11/03 00:30	3.01	799.01	2.00	3.09	10.28	806.28	2.56	3.96	5.98
10/11/03 00:35	3.01	799.01	1.97	3.05	10.28	806.28	2.52	3.89	5.95
10/11/03 00:40	3.01	799.01	1.94	3.01	10.28	806.28	2.47	3.83	5.93
10/11/03 00:45	3.01	799.01	1.92	2.97	10.27	806.27	2.43	3.77	5.90
10/11/03 00:50	3.01	799.01	1.90	2.95	10.27	806.27	2.40	3.71	5.88
10/11/03 00:55	3.01	799.01	1.89	2.92	10.27	806.27	2.36	3.65	5.85
10/11/03 01:00	3.01	799.01	1.87	2.90	10.27	806.27	2.32	3.60	5.83
10/11/03 01:05	3.01	799.01	1.86	2.87	10.26	806.26	2.29	3.55	5.81
10/11/03 01:10	3.01	799.01	1.84	2.84	10.26	806.26	2.26	3.50	5.79
10/11/03 01:15	3.01	799.01	1.82	2.81	10.26	806.26	2.23	3.45	5.77
10/11/03 01:20	3.01	799.01	1.80	2.78	10.26	806.26	2.20	3.40	5.75
10/11/03 01:25	3.01	799.01	1.78	2.75	10.25	806.25	2.17	3.35	5.73
10/11/03 01:30	3.01	799.01	1.76	2.72	10.25	806.25	2.14	3.31	5.70
10/11/03 01:35	3.01	799.01	1.74	2.69	10.25	806.25	2.11	3.27	5.68
10/11/03 01:40	3.01	799.01	1.72	2.67	10.25	806.25	2.08	3.22	5.66
10/11/03 01:45	3.01	799.01	1.71	2.65	10.25	806.25	2.06	3.18	5.65
10/11/03 01:50	3.01	799.01	1.70	2.62	10.24	806.24	2.03	3.15	5.63
10/11/03 01:55	3.01	799.01	1.68	2.60	10.24	806.24	2.01	3.11	5.61
10/11/03 02:00	3.01	799.01	1.67	2.58	10.24	806.24	1.99	3.07	5.59
10/11/03 02:05	3.01	799.01	1.66	2.56	10.24	806.24	1.96	3.04	5.57
10/11/03 02:10	3.01	799.01	1.65	2.55	10.24	806.24	1.94	3.00	5.56
10/11/03 02:15	3.01	799.01	1.64	2.53	10.23	806.23	1.92	2.97	5.54
10/11/03 02:20	3.01	799.01	1.63	2.52	10.23	806.23	1.90	2.94	5.52
10/11/03 02:25	3.01	799.01	1.62	2.50	10.23	806.23	1.88	2.91	5.51
10/11/03 02:30	3.01	799.01	1.61	2.49	10.23	806.23	1.86	2.88	5.49
10/11/03 02:35	3.01	799.01	1.60	2.47	10.23	806.23	1.85	2.86	5.48
10/11/03 02:40	3.01	799.01	1.59	2.46	10.23	806.23	1.83	2.83	5.47
10/11/03 02:45	3.01	799.01	1.58	2.45	10.23	806.23	1.81	2.80	5.45
10/11/03 02:50	3.01	799.01	1.58	2.44	10.22	806.22	1.80	2.78	5.44
10/11/03 02:55	3.01	799.01	1.57	2.43	10.22	806.22	1.78	2.76	5.43
10/11/03 03:00	3.01	799.01	1.56	2.42	10.22	806.22	1.77	2.73	5.42
10/11/03 03:05	3.01	799.01	1.56	2.41	10.22	806.22	1.75	2.71	5.41
10/11/03 03:10	3.01	799.01	1.56	2.41	10.22	806.22	1.74	2.69	5.40
10/11/03 03:15	3.01	799.01	1.55	2.40	10.22	806.22	1.73	2.67	5.39
10/11/03 03:20	3.01	799.01	1.55	2.40	10.22	806.22	1.72	2.66	5.38
10/11/03 03:25	3.01	799.01	1.55	2.39	10.22	806.22	1.71	2.64	5.37
10/11/03 03:30	3.01	799.01	1.54	2.39	10.22	806.22	1.70	2.62	5.36
10/11/03 03:35	3.01	799.01	1.54	2.39	10.22	806.22	1.69	2.61	5.35
10/11/03 03:40	3.01	799.01	1.54	2.38	10.21	806.21	1.68	2.59	5.34
10/11/03 03:45	3.01	799.01	1.54	2.38	10.21	806.21	1.67	2.58	5.33
10/11/03 03:50	3.01	799.01	1.54	2.38	10.21	806.21	1.66	2.57	5.33
10/11/03 03:55	3.01	799.01	1.54	2.38	10.21	806.21	1.65	2.56	5.32
10/11/03 04:00	3.01	799.01	1.53	2.37	10.21	806.21	1.64	2.54	5.31
10/11/03 04:05	3.01	799.01	1.53	2.37	10.21	806.21	1.64	2.53	5.31
10/11/03 04:10	3.01	799.01	1.53	2.37	10.21	806.21	1.63	2.52	5.30
10/11/03 04:15	3.01	799.01	1.53	2.37	10.21	806.21	1.62	2.51	5.30
10/11/03 04:20	3.01	799.01	1.53	2.37	10.21	806.21	1.62	2.50	5.29
10/11/03 04:25	3.01	799.01	1.53	2.37	10.21	806.21	1.61	2.50	5.29
10/11/03 04:30	3.01	799.01	1.53	2.36	10.21	806.21	1.61	2.49	5.28
10/11/03 04:35	3.01	799.01	1.53	2.36	10.21	806.21	1.60	2.48	5.28
10/11/03 04:40	3.01	799.01	1.53	2.36	10.21	806.21	1.60	2.47	5.27
10/11/03 04:45	3.01	799.01	1.53	2.36	10.21	806.21	1.59	2.46	5.27
10/11/03 04:50	3.01	799.01	1.53	2.36	10.21	806.21	1.59	2.46	5.26
10/11/03 04:55	3.01	799.01	1.52	2.36	10.21	806.21	1.58	2.45	5.26
10/11/03 05:00	3.01	799.01	1.52	2.36	10.21	806.21	1.58	2.45	5.26
10/11/03 05:05	3.01	799.01	1.52	2.36	10.21	806.21	1.58	2.44	5.25
10/11/03 05:10	3.01	799.01	1.52	2.35	10.21	806.21	1.57	2.43	5.25
10/11/03 05:15	3.01	799.01	1.52	2.35	10.21	806.21	1.57	2.43	5.25
10/11/03 05:20	3.01	799.01	1.52	2.35	10.21	806.21	1.57	2.42	5.25
10/11/03 05:25	3.01	799.01	1.52	2.35	10.20	806.20	1.56	2.42	5.24
10/11/03 05:30	3.01	799.01	1.52	2.35	10.20	806.20	1.56	2.42	5.24
10/11/03 05:35	3.01	799.01	1.52	2.35	10.20	806.20	1.56	2.41	5.24

10/11/03 05:40	3.01	799.01	1.52	2.34	10.20	806.20	1.56	2.41	5.23
10/11/03 05:45	3.01	799.01	1.51	2.34	10.20	806.20	1.55	2.40	5.23
10/11/03 05:50	3.01	799.01	1.51	2.34	10.20	806.20	1.55	2.40	5.23
10/11/03 05:55	3.01	799.01	1.51	2.34	10.20	806.20	1.55	2.40	5.23
10/11/03 06:00	3.01	799.01	1.51	2.34	10.20	806.20	1.55	2.39	5.23
10/11/03 06:05	3.01	799.01	1.51	2.34	10.20	806.20	1.54	2.39	5.22
10/11/03 06:10	3.01	799.01	1.51	2.33	10.20	806.20	1.54	2.38	5.22
10/11/03 06:15	3.01	799.01	1.51	2.33	10.20	806.20	1.54	2.38	5.22
10/11/03 06:20	3.01	799.01	1.51	2.33	10.20	806.20	1.54	2.38	5.22
10/11/03 06:25	3.01	799.01	1.50	2.33	10.20	806.20	1.53	2.37	5.22
10/11/03 06:30	3.01	799.01	1.50	2.33	10.20	806.20	1.53	2.37	5.21
10/11/03 06:35	3.01	799.01	1.50	2.32	10.20	806.20	1.53	2.37	5.21
10/11/03 06:40	3.01	799.01	1.50	2.32	10.20	806.20	1.53	2.37	5.21
10/11/03 06:45	3.01	799.01	1.50	2.32	10.20	806.20	1.53	2.36	5.21
10/11/03 06:50	3.01	799.01	1.50	2.32	10.20	806.20	1.53	2.36	5.21
10/11/03 06:55	3.01	799.01	1.50	2.31	10.20	806.20	1.52	2.36	5.20
10/11/03 07:00	3.01	799.01	1.49	2.31	10.20	806.20	1.52	2.35	5.20
10/11/03 07:05	3.01	799.01	1.49	2.31	10.20	806.20	1.52	2.35	5.20
10/11/03 07:10	3.01	799.01	1.49	2.31	10.20	806.20	1.52	2.35	5.20
10/11/03 07:15	3.01	799.01	1.49	2.30	10.20	806.20	1.52	2.35	5.20
10/11/03 07:20	3.01	799.01	1.49	2.30	10.20	806.20	1.51	2.34	5.20
10/11/03 07:25	3.01	799.01	1.49	2.30	10.20	806.20	1.51	2.34	5.19
10/11/03 07:30	3.01	799.01	1.48	2.30	10.20	806.20	1.51	2.34	5.19
10/11/03 07:35	3.01	799.01	1.48	2.29	10.20	806.20	1.51	2.33	5.19
10/11/03 07:40	3.01	799.01	1.48	2.29	10.20	806.20	1.51	2.33	5.19
10/11/03 07:45	3.01	799.01	1.48	2.29	10.20	806.20	1.51	2.33	5.19
10/11/03 07:50	3.01	799.01	1.48	2.29	10.20	806.20	1.50	2.33	5.19
10/11/03 07:55	3.01	799.01	1.48	2.28	10.20	806.20	1.50	2.32	5.18
10/11/03 08:00	3.01	799.01	1.47	2.28	10.20	806.20	1.50	2.32	5.18
10/11/03 08:05	3.01	799.01	1.47	2.28	10.20	806.20	1.50	2.32	5.18
10/11/03 08:10	3.01	799.01	1.47	2.28	10.20	806.20	1.50	2.32	5.18
10/11/03 08:15	3.01	799.01	1.47	2.27	10.20	806.20	1.49	2.31	5.18
10/11/03 08:20	3.01	799.01	1.47	2.27	10.20	806.20	1.49	2.31	5.18
10/11/03 08:25	3.01	799.01	1.47	2.27	10.20	806.20	1.49	2.31	5.17
10/11/03 08:30	3.01	799.01	1.46	2.27	10.20	806.20	1.49	2.30	5.17
10/11/03 08:35	3.01	799.01	1.46	2.26	10.20	806.20	1.49	2.30	5.17
10/11/03 08:40	3.01	799.01	1.46	2.26	10.20	806.20	1.49	2.30	5.17
10/11/03 08:45	3.01	799.01	1.46	2.26	10.20	806.20	1.48	2.30	5.17
10/11/03 08:50	3.01	799.01	1.46	2.25	10.20	806.20	1.48	2.29	5.17
10/11/03 08:55	3.01	799.01	1.46	2.25	10.20	806.20	1.48	2.29	5.16
10/11/03 09:00	3.01	799.01	1.45	2.25	10.20	806.20	1.48	2.29	5.16
10/11/03 09:05	3.01	799.01	1.45	2.25	10.20	806.20	1.48	2.29	5.16
10/11/03 09:10	3.01	799.01	1.45	2.24	10.20	806.20	1.48	2.28	5.16
10/11/03 09:15	3.01	799.01	1.45	2.24	10.20	806.20	1.47	2.28	5.16
10/11/03 09:20	3.01	799.01	1.45	2.24	10.20	806.20	1.47	2.28	5.16
10/11/03 09:25	3.01	799.01	1.44	2.23	10.20	806.20	1.47	2.27	5.15
10/11/03 09:30	3.01	799.01	1.44	2.23	10.20	806.20	1.47	2.27	5.15
10/11/03 09:35	3.01	799.01	1.44	2.23	10.20	806.20	1.47	2.27	5.15
10/11/03 09:40	3.01	799.01	1.44	2.23	10.20	806.20	1.46	2.27	5.15
10/11/03 09:45	3.01	799.01	1.44	2.22	10.20	806.20	1.46	2.26	5.15
10/11/03 09:50	3.01	799.01	1.44	2.22	10.20	806.20	1.46	2.26	5.15
10/11/03 09:55	3.01	799.01	1.43	2.22	10.20	806.20	1.46	2.26	5.14
10/11/03 10:00	3.01	799.01	1.43	2.21	10.20	806.20	1.46	2.26	5.14
10/11/03 10:05	3.01	799.01	1.43	2.21	10.20	806.20	1.46	2.25	5.14
10/11/03 10:10	3.01	799.01	1.43	2.21	10.20	806.20	1.45	2.25	5.14
10/11/03 10:15	3.01	799.01	1.43	2.21	10.19	806.19	1.45	2.25	5.14
10/11/03 10:20	3.01	799.01	1.42	2.20	10.19	806.19	1.45	2.24	5.14
10/11/03 10:25	3.01	799.01	1.42	2.20	10.19	806.19	1.45	2.24	5.13
10/11/03 10:30	3.01	799.01	1.42	2.20	10.19	806.19	1.45	2.24	5.13
10/11/03 10:35	3.01	799.01	1.42	2.19	10.19	806.19	1.45	2.24	5.13
10/11/03 10:40	3.01	799.01	1.42	2.19	10.19	806.19	1.44	2.23	5.13
10/11/03 10:45	3.01	799.01	1.41	2.19	10.19	806.19	1.44	2.23	5.13
10/11/03 10:50	3.01	799.01	1.41	2.19	10.19	806.19	1.44	2.23	5.12
10/11/03 10:55	3.01	799.01	1.41	2.18	10.19	806.19	1.44	2.22	5.12
10/11/03 11:00	3.01	799.01	1.41	2.18	10.19	806.19	1.44	2.22	5.12
10/11/03 11:05	3.01	799.01	1.41	2.18	10.19	806.19	1.43	2.22	5.12
10/11/03 11:10	3.01	799.01	1.41	2.17	10.19	806.19	1.43	2.22	5.12
10/11/03 11:15	3.01	799.01	1.40	2.17	10.19	806.19	1.43	2.21	5.12

10/11/03 11:20	3.01	799.01	1.40	2.17	10.19	806.19	1.43	2.21	5.11
10/11/03 11:25	3.01	799.01	1.40	2.16	10.19	806.19	1.43	2.21	5.11
10/11/03 11:30	3.01	799.01	1.40	2.16	10.19	806.19	1.42	2.20	5.11
10/11/03 11:35	3.01	799.01	1.40	2.16	10.19	806.19	1.42	2.20	5.11
10/11/03 11:40	3.01	799.01	1.39	2.16	10.19	806.19	1.42	2.20	5.11
10/11/03 11:45	3.01	799.01	1.39	2.15	10.19	806.19	1.42	2.20	5.10
10/11/03 11:50	3.01	799.01	1.39	2.15	10.19	806.19	1.42	2.19	5.10
10/11/03 11:55	3.01	799.01	1.39	2.15	10.19	806.19	1.42	2.19	5.10
10/11/03 12:00	3.01	799.01	1.39	2.15	10.19	806.19	1.41	2.19	5.10
10/11/03 12:05	3.01	799.01	1.39	2.14	10.19	806.19	1.41	2.18	5.10
10/11/03 12:10	3.01	799.01	1.38	2.14	10.19	806.19	1.41	2.18	5.10
10/11/03 12:15	3.01	799.01	1.38	2.14	10.19	806.19	1.41	2.18	5.09
10/11/03 12:20	3.01	799.01	1.38	2.14	10.19	806.19	1.41	2.18	5.09
10/11/03 12:25	3.01	799.01	1.38	2.13	10.19	806.19	1.41	2.17	5.09
10/11/03 12:30	3.01	799.01	1.38	2.13	10.19	806.19	1.40	2.17	5.09
10/11/03 12:35	3.01	799.01	1.37	2.12	10.19	806.19	1.40	2.17	5.09
10/11/03 12:40	3.01	799.01	1.37	2.12	10.19	806.19	1.40	2.17	5.08
10/11/03 12:45	3.01	799.01	1.37	2.12	10.19	806.19	1.40	2.16	5.08
10/11/03 12:50	3.01	799.01	1.37	2.11	10.19	806.19	1.40	2.16	5.08
10/11/03 12:55	3.01	799.01	1.36	2.11	10.19	806.19	1.39	2.16	5.08
10/11/03 13:00	3.01	799.01	1.36	2.11	10.19	806.19	1.39	2.15	5.08
10/11/03 13:05	3.01	799.01	1.36	2.10	10.19	806.19	1.39	2.15	5.07
10/11/03 13:10	3.01	799.01	1.36	2.10	10.19	806.19	1.39	2.15	5.07
10/11/03 13:15	3.01	799.01	1.36	2.10	10.19	806.19	1.39	2.14	5.07
10/11/03 13:20	3.01	799.01	1.35	2.09	10.19	806.19	1.38	2.14	5.07
10/11/03 13:25	3.01	799.01	1.35	2.09	10.19	806.19	1.38	2.14	5.07
10/11/03 13:30	3.01	799.01	1.35	2.09	10.19	806.19	1.38	2.13	5.06
10/11/03 13:35	3.01	799.01	1.35	2.08	10.19	806.19	1.38	2.13	5.06
10/11/03 13:40	3.01	799.01	1.34	2.08	10.19	806.19	1.38	2.13	5.06
10/11/03 13:45	3.01	799.01	1.34	2.08	10.19	806.19	1.37	2.12	5.06
10/11/03 13:50	3.01	799.01	1.34	2.07	10.19	806.19	1.37	2.12	5.06
10/11/03 13:55	3.01	799.01	1.34	2.07	10.19	806.19	1.37	2.12	5.05
10/11/03 14:00	3.01	799.01	1.33	2.07	10.19	806.19	1.37	2.11	5.05
10/11/03 14:05	3.01	799.01	1.33	2.06	10.19	806.19	1.36	2.11	5.05
10/11/03 14:10	3.01	799.01	1.33	2.06	10.19	806.19	1.36	2.11	5.05
10/11/03 14:15	3.01	799.01	1.33	2.05	10.19	806.19	1.36	2.10	5.04
10/11/03 14:20	3.01	799.01	1.32	2.05	10.19	806.19	1.36	2.10	5.04
10/11/03 14:25	3.01	799.01	1.32	2.04	10.19	806.19	1.36	2.10	5.04
10/11/03 14:30	3.01	799.01	1.32	2.04	10.19	806.19	1.35	2.09	5.04
10/11/03 14:35	3.01	799.01	1.31	2.03	10.19	806.19	1.35	2.09	5.03
10/11/03 14:40	3.01	799.01	1.31	2.03	10.19	806.19	1.35	2.09	5.03
10/11/03 14:45	3.01	799.01	1.31	2.02	10.19	806.19	1.35	2.08	5.03
10/11/03 14:50	3.01	799.01	1.30	2.02	10.19	806.19	1.34	2.08	5.02
10/11/03 14:55	3.01	799.01	1.30	2.01	10.18	806.18	1.34	2.07	5.02
10/11/03 15:00	3.01	799.01	1.30	2.01	10.18	806.18	1.34	2.07	5.02
10/11/03 15:05	3.01	799.01	1.29	2.00	10.18	806.18	1.33	2.07	5.01
10/11/03 15:10	3.01	799.01	1.29	2.00	10.18	806.18	1.33	2.06	5.01
10/11/03 15:15	3.01	799.01	1.29	1.99	10.18	806.18	1.33	2.06	5.01
10/11/03 15:20	3.01	799.01	1.28	1.99	10.18	806.18	1.33	2.05	5.00
10/11/03 15:25	3.01	799.01	1.28	1.98	10.18	806.18	1.32	2.05	5.00
10/11/03 15:30	3.01	799.01	1.28	1.98	10.18	806.18	1.32	2.04	5.00
10/11/03 15:35	3.01	799.01	1.27	1.97	10.18	806.18	1.32	2.04	4.99
10/11/03 15:40	3.01	799.01	1.27	1.96	10.18	806.18	1.31	2.03	4.99
10/11/03 15:45	3.01	799.01	1.27	1.96	10.18	806.18	1.31	2.03	4.99
10/11/03 15:50	3.01	799.01	1.26	1.95	10.18	806.18	1.31	2.02	4.98
10/11/03 15:55	3.01	799.01	1.26	1.95	10.18	806.18	1.31	2.02	4.98
10/11/03 16:00	3.01	799.01	1.26	1.94	10.18	806.18	1.30	2.02	4.98
10/11/03 16:05	3.01	799.01	1.25	1.94	10.18	806.18	1.30	2.01	4.97
10/11/03 16:10	3.01	799.01	1.25	1.93	10.18	806.18	1.30	2.01	4.97
10/11/03 16:15	3.01	799.01	1.24	1.92	10.18	806.18	1.29	2.00	4.97
10/11/03 16:20	3.01	799.01	1.24	1.92	10.18	806.18	1.29	2.00	4.96
10/11/03 16:25	3.01	799.01	1.24	1.91	10.18	806.18	1.29	1.99	4.96
10/11/03 16:30	3.01	799.01	1.23	1.91	10.18	806.18	1.28	1.98	4.96
10/11/03 16:35	3.01	799.01	1.23	1.90	10.18	806.18	1.28	1.98	4.95
10/11/03 16:40	3.01	799.01	1.22	1.89	10.18	806.18	1.28	1.97	4.95
10/11/03 16:45	3.01	799.01	1.22	1.89	10.18	806.18	1.27	1.97	4.95
10/11/03 16:50	3.01	799.01	1.22	1.88	10.18	806.18	1.27	1.96	4.94
10/11/03 16:55	3.01	799.01	1.21	1.88	10.18	806.18	1.27	1.96	4.94

10/11/03 17:00	3.01	799.01	1.21	1.87	10.18	806.18	1.26	1.95	4.94
10/11/03 17:05	3.01	799.01	1.21	1.87	10.18	806.18	1.26	1.95	4.93
10/11/03 17:10	3.01	799.01	1.20	1.86	10.18	806.18	1.26	1.94	4.93
10/11/03 17:15	3.01	799.01	1.20	1.85	10.18	806.18	1.25	1.94	4.93
10/11/03 17:20	3.01	799.01	1.19	1.85	10.18	806.18	1.25	1.93	4.92
10/11/03 17:25	3.01	799.01	1.19	1.84	10.18	806.18	1.24	1.93	4.92
10/11/03 17:30	3.01	799.01	1.18	1.83	10.18	806.18	1.24	1.92	4.91
10/11/03 17:35	3.01	799.01	1.18	1.83	10.18	806.18	1.24	1.91	4.91
10/11/03 17:40	3.01	799.01	1.18	1.82	10.17	806.17	1.23	1.91	4.91
10/11/03 17:45	3.01	799.01	1.17	1.81	10.17	806.17	1.23	1.90	4.90
10/11/03 17:50	3.01	799.01	1.17	1.81	10.17	806.17	1.23	1.90	4.90
10/11/03 17:55	3.01	799.01	1.16	1.80	10.17	806.17	1.22	1.89	4.89
10/11/03 18:00	3.01	799.01	1.16	1.80	10.17	806.17	1.22	1.88	4.89
10/11/03 18:05	3.01	799.01	1.16	1.79	10.17	806.17	1.21	1.88	4.89
10/11/03 18:10	3.01	799.01	1.15	1.78	10.17	806.17	1.21	1.87	4.88
10/11/03 18:15	3.01	799.01	1.15	1.78	10.17	806.17	1.21	1.87	4.88
10/11/03 18:20	3.01	799.01	1.14	1.77	10.17	806.17	1.20	1.86	4.87
10/11/03 18:25	3.01	799.01	1.14	1.76	10.17	806.17	1.20	1.86	4.87
10/11/03 18:30	3.01	799.01	1.14	1.76	10.17	806.17	1.20	1.85	4.87
10/11/03 18:35	3.01	799.01	1.13	1.75	10.17	806.17	1.19	1.84	4.86
10/11/03 18:40	3.01	799.01	1.13	1.75	10.17	806.17	1.19	1.84	4.86
10/11/03 18:45	3.01	799.01	1.12	1.74	10.17	806.17	1.18	1.83	4.85
10/11/03 18:50	3.01	799.01	1.12	1.73	10.17	806.17	1.18	1.83	4.85
10/11/03 18:55	3.01	799.01	1.12	1.73	10.17	806.17	1.18	1.82	4.84
10/11/03 19:00	3.01	799.01	1.11	1.72	10.17	806.17	1.17	1.81	4.84
10/11/03 19:05	3.01	799.01	1.11	1.71	10.17	806.17	1.17	1.81	4.84
10/11/03 19:10	3.01	799.01	1.10	1.71	10.17	806.17	1.16	1.80	4.83
10/11/03 19:15	3.01	799.01	1.10	1.70	10.17	806.17	1.16	1.80	4.83
10/11/03 19:20	3.01	799.01	1.10	1.70	10.17	806.17	1.16	1.79	4.82
10/11/03 19:25	3.01	799.01	1.09	1.69	10.17	806.17	1.15	1.78	4.82
10/11/03 19:30	3.01	799.01	1.09	1.68	10.17	806.17	1.15	1.78	4.81
10/11/03 19:35	3.01	799.01	1.08	1.68	10.17	806.17	1.15	1.77	4.81
10/11/03 19:40	3.01	799.01	1.08	1.67	10.17	806.17	1.14	1.77	4.81
10/11/03 19:45	3.01	799.01	1.08	1.67	10.17	806.17	1.14	1.76	4.80
10/11/03 19:50	3.01	799.01	1.07	1.66	10.17	806.17	1.13	1.75	4.80
10/11/03 19:55	3.01	799.01	1.07	1.65	10.16	806.16	1.13	1.75	4.79
10/11/03 20:00	3.01	799.01	1.06	1.65	10.16	806.16	1.13	1.74	4.79
10/11/03 20:05	3.01	799.01	1.06	1.64	10.16	806.16	1.12	1.74	4.78
10/11/03 20:10	3.01	799.01	1.06	1.64	10.16	806.16	1.12	1.73	4.78
10/11/03 20:15	3.01	799.01	1.05	1.63	10.16	806.16	1.11	1.72	4.77
10/11/03 20:20	3.01	799.01	1.05	1.62	10.16	806.16	1.11	1.72	4.77
10/11/03 20:25	3.01	799.01	1.05	1.62	10.16	806.16	1.11	1.71	4.77
10/11/03 20:30	3.01	799.01	1.04	1.61	10.16	806.16	1.10	1.71	4.76
10/11/03 20:35	3.01	799.01	1.04	1.61	10.16	806.16	1.10	1.70	4.76
10/11/03 20:40	3.01	799.01	1.04	1.60	10.16	806.16	1.10	1.70	4.75
10/11/03 20:45	3.01	799.01	1.03	1.60	10.16	806.16	1.09	1.69	4.75
10/11/03 20:50	3.01	799.01	1.03	1.59	10.16	806.16	1.09	1.68	4.74
10/11/03 20:55	3.01	799.01	1.03	1.59	10.16	806.16	1.08	1.68	4.74
10/11/03 21:00	3.01	799.01	1.02	1.59	10.16	806.16	1.08	1.67	4.74
10/11/03 21:05	3.01	799.01	1.02	1.58	10.16	806.16	1.08	1.67	4.73
10/11/03 21:10	3.01	799.01	1.02	1.58	10.16	806.16	1.07	1.66	4.73
10/11/03 21:15	3.01	799.01	1.02	1.57	10.16	806.16	1.07	1.66	4.72
10/11/03 21:20	3.01	799.01	1.01	1.57	10.16	806.16	1.07	1.65	4.72
10/11/03 21:25	3.01	799.01	1.01	1.56	10.16	806.16	1.06	1.65	4.72
10/11/03 21:30	3.01	799.01	1.01	1.56	10.16	806.16	1.06	1.64	4.71
10/11/03 21:35	3.01	799.01	1.01	1.56	10.16	806.16	1.06	1.64	4.71
10/11/03 21:40	3.01	799.01	1.00	1.55	10.16	806.16	1.06	1.63	4.70
10/11/03 21:45	3.01	799.01	1.00	1.55	10.16	806.16	1.05	1.63	4.70
10/11/03 21:50	3.01	799.01	1.00	1.55	10.16	806.16	1.05	1.62	4.70
10/11/03 21:55	3.01	799.01	1.00	1.54	10.16	806.16	1.05	1.62	4.69
10/11/03 22:00	3.01	799.01	1.00	1.54	10.16	806.16	1.04	1.61	4.69
10/11/03 22:05	3.01	799.01	0.99	1.54	10.16	806.16	1.04	1.61	4.69
10/11/03 22:10	3.01	799.01	0.99	1.53	10.16	806.16	1.04	1.61	4.68
10/11/03 22:15	3.01	799.01	0.99	1.53	10.16	806.16	1.03	1.60	4.68
10/11/03 22:20	3.01	799.01	0.99	1.53	10.16	806.16	1.03	1.60	4.68
10/11/03 22:25	3.01	799.01	0.98	1.52	10.15	806.15	1.03	1.59	4.67
10/11/03 22:30	3.01	799.01	0.98	1.52	10.15	806.15	1.03	1.59	4.67
10/11/03 22:35	3.01	799.01	0.98	1.52	10.15	806.15	1.02	1.58	4.67

10/11/03 22:40	3.01	799.01	0.98	1.52	10.15	806.15	1.02	1.58	4.66
10/11/03 22:45	3.01	799.01	0.98	1.51	10.15	806.15	1.02	1.58	4.66
10/11/03 22:50	3.01	799.01	0.98	1.51	10.15	806.15	1.02	1.57	4.66
10/11/03 22:55	3.01	799.01	0.97	1.51	10.15	806.15	1.01	1.57	4.65
10/11/03 23:00	3.01	799.01	0.97	1.50	10.15	806.15	1.01	1.57	4.65
10/11/03 23:05	3.01	799.01	0.97	1.50	10.15	806.15	1.01	1.56	4.65
10/11/03 23:10	3.01	799.01	0.97	1.50	10.15	806.15	1.01	1.56	4.64
10/11/03 23:15	3.01	799.01	0.97	1.50	10.15	806.15	1.00	1.55	4.64
10/11/03 23:20	3.01	799.01	0.97	1.49	10.15	806.15	1.00	1.55	4.64
10/11/03 23:25	3.01	799.01	0.96	1.49	10.15	806.15	1.00	1.55	4.64
10/11/03 23:30	3.01	799.01	0.96	1.49	10.15	806.15	1.00	1.54	4.63
10/11/03 23:35	3.01	799.01	0.96	1.49	10.15	806.15	1.00	1.54	4.63
10/11/03 23:40	3.01	799.01	0.96	1.48	10.15	806.15	0.99	1.54	4.63
10/11/03 23:45	3.01	799.01	0.96	1.48	10.15	806.15	0.99	1.54	4.62
10/11/03 23:50	3.01	799.01	0.96	1.48	10.15	806.15	0.99	1.53	4.62
10/11/03 23:55	3.01	799.01	0.96	1.48	10.15	806.15	0.99	1.53	4.62
10/12/03 00:00	3.01	799.01	0.95	1.48	10.15	806.15	0.99	1.53	4.61
10/12/03 00:05	3.01	799.01	0.95	1.47	10.15	806.15	0.98	1.52	4.61
10/12/03 00:10	3.01	799.01	0.95	1.47	10.15	806.15	0.98	1.52	4.61
10/12/03 00:15	3.01	799.01	0.95	1.47	10.15	806.15	0.98	1.52	4.61
10/12/03 00:20	3.01	799.01	0.95	1.47	10.15	806.15	0.98	1.51	4.60
10/12/03 00:25	3.01	799.01	0.95	1.46	10.15	806.15	0.98	1.51	4.60
10/12/03 00:30	3.01	799.01	0.95	1.46	10.15	806.15	0.98	1.51	4.60
10/12/03 00:35	3.01	799.01	0.94	1.46	10.15	806.15	0.97	1.51	4.60
10/12/03 00:40	3.01	799.01	0.94	1.46	10.15	806.15	0.97	1.50	4.59
10/12/03 00:45	3.01	799.01	0.94	1.46	10.15	806.15	0.97	1.50	4.59
10/12/03 00:50	3.01	799.01	0.94	1.45	10.15	806.15	0.97	1.50	4.59
10/12/03 00:55	3.01	799.01	0.94	1.45	10.15	806.15	0.97	1.50	4.59
10/12/03 01:00	3.01	799.01	0.94	1.45	10.15	806.15	0.97	1.49	4.58
10/12/03 01:05	3.01	799.01	0.94	1.45	10.15	806.15	0.96	1.49	4.58
10/12/03 01:10	3.01	799.01	0.94	1.45	10.15	806.15	0.96	1.49	4.58
10/12/03 01:15	3.01	799.01	0.93	1.44	10.15	806.15	0.96	1.49	4.58
10/12/03 01:20	3.01	799.01	0.93	1.44	10.15	806.15	0.96	1.48	4.57
10/12/03 01:25	3.01	799.01	0.93	1.44	10.15	806.15	0.96	1.48	4.57
10/12/03 01:30	3.01	799.01	0.93	1.44	10.15	806.15	0.96	1.48	4.57
10/12/03 01:35	3.01	799.01	0.93	1.44	10.15	806.15	0.95	1.48	4.57
10/12/03 01:40	3.01	799.01	0.93	1.44	10.15	806.15	0.95	1.47	4.56
10/12/03 01:45	3.01	799.01	0.93	1.43	10.15	806.15	0.95	1.47	4.56
10/12/03 01:50	3.01	799.01	0.93	1.43	10.15	806.15	0.95	1.47	4.56
10/12/03 01:55	3.01	799.01	0.92	1.43	10.15	806.15	0.95	1.47	4.56
10/12/03 02:00	3.01	799.01	0.92	1.43	10.15	806.15	0.95	1.46	4.56
10/12/03 02:05	3.01	799.01	0.92	1.43	10.15	806.15	0.95	1.46	4.55
10/12/03 02:10	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/12/03 02:15	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/12/03 02:20	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.46	4.55
10/12/03 02:25	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.45	4.55
10/12/03 02:30	3.01	799.01	0.92	1.42	10.15	806.15	0.94	1.45	4.54
10/12/03 02:35	3.01	799.01	0.91	1.41	10.15	806.15	0.94	1.45	4.54
10/12/03 02:40	3.01	799.01	0.91	1.41	10.15	806.15	0.94	1.45	4.54
10/12/03 02:45	3.01	799.01	0.91	1.41	10.15	806.15	0.93	1.45	4.54
10/12/03 02:50	3.01	799.01	0.91	1.41	10.15	806.15	0.93	1.44	4.54
10/12/03 02:55	3.01	799.01	0.91	1.41	10.15	806.15	0.93	1.44	4.53
10/12/03 03:00	3.01	799.01	0.91	1.41	10.14	806.14	0.93	1.44	4.53
10/12/03 03:05	3.01	799.01	0.91	1.40	10.14	806.14	0.93	1.44	4.53
10/12/03 03:10	3.01	799.01	0.91	1.40	10.14	806.14	0.93	1.44	4.53
10/12/03 03:15	3.01	799.01	0.91	1.40	10.14	806.14	0.93	1.43	4.53
10/12/03 03:20	3.01	799.01	0.90	1.40	10.14	806.14	0.93	1.43	4.52
10/12/03 03:25	3.01	799.01	0.90	1.40	10.14	806.14	0.92	1.43	4.52
10/12/03 03:30	3.01	799.01	0.90	1.40	10.14	806.14	0.92	1.43	4.52
10/12/03 03:35	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.43	4.52
10/12/03 03:40	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.42	4.52
10/12/03 03:45	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.42	4.51
10/12/03 03:50	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.42	4.51
10/12/03 03:55	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.42	4.51
10/12/03 04:00	3.01	799.01	0.90	1.39	10.14	806.14	0.92	1.42	4.51
10/12/03 04:05	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.42	4.51
10/12/03 04:10	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.51
10/12/03 04:15	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.50

10/12/03 04:20	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.50
10/12/03 04:25	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.50
10/12/03 04:30	3.01	799.01	0.89	1.38	10.14	806.14	0.91	1.41	4.50
10/12/03 04:35	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.40	4.50
10/12/03 04:40	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.40	4.49
10/12/03 04:45	3.01	799.01	0.89	1.37	10.14	806.14	0.91	1.40	4.49
10/12/03 04:50	3.01	799.01	0.89	1.37	10.14	806.14	0.90	1.40	4.49
10/12/03 04:55	3.01	799.01	0.88	1.37	10.14	806.14	0.90	1.40	4.49
10/12/03 05:00	3.01	799.01	0.88	1.37	10.14	806.14	0.90	1.40	4.49
10/12/03 05:05	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.49
10/12/03 05:10	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/12/03 05:15	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/12/03 05:20	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/12/03 05:25	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/12/03 05:30	3.01	799.01	0.88	1.36	10.14	806.14	0.90	1.39	4.48
10/12/03 05:35	3.01	799.01	0.88	1.36	10.14	806.14	0.89	1.38	4.48
10/12/03 05:40	3.01	799.01	0.88	1.35	10.14	806.14	0.89	1.38	4.47
10/12/03 05:45	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/12/03 05:50	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/12/03 05:55	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/12/03 06:00	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.38	4.47
10/12/03 06:05	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.37	4.47
10/12/03 06:10	3.01	799.01	0.87	1.35	10.14	806.14	0.89	1.37	4.46
10/12/03 06:15	3.01	799.01	0.87	1.34	10.14	806.14	0.89	1.37	4.46
10/12/03 06:20	3.01	799.01	0.87	1.34	10.14	806.14	0.89	1.37	4.46
10/12/03 06:25	3.01	799.01	0.87	1.34	10.14	806.14	0.88	1.37	4.46
10/12/03 06:30	3.01	799.01	0.87	1.34	10.14	806.14	0.88	1.37	4.46
10/12/03 06:35	3.01	799.01	0.86	1.34	10.14	806.14	0.88	1.36	4.46
10/12/03 06:40	3.01	799.01	0.86	1.34	10.14	806.14	0.88	1.36	4.45
10/12/03 06:45	3.01	799.01	0.86	1.34	10.14	806.14	0.88	1.36	4.45
10/12/03 06:50	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/12/03 06:55	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/12/03 07:00	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/12/03 07:05	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.36	4.45
10/12/03 07:10	3.01	799.01	0.86	1.33	10.14	806.14	0.88	1.35	4.45
10/12/03 07:15	3.01	799.01	0.86	1.33	10.14	806.14	0.87	1.35	4.44
10/12/03 07:20	3.01	799.01	0.86	1.33	10.14	806.14	0.87	1.35	4.44
10/12/03 07:25	3.01	799.01	0.86	1.32	10.14	806.14	0.87	1.35	4.44
10/12/03 07:30	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/12/03 07:35	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/12/03 07:40	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.35	4.44
10/12/03 07:45	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.34	4.44
10/12/03 07:50	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.34	4.43
10/12/03 07:55	3.01	799.01	0.85	1.32	10.14	806.14	0.87	1.34	4.43
10/12/03 08:00	3.01	799.01	0.85	1.31	10.14	806.14	0.87	1.34	4.43
10/12/03 08:05	3.01	799.01	0.85	1.31	10.14	806.14	0.86	1.34	4.43
10/12/03 08:10	3.01	799.01	0.85	1.31	10.14	806.14	0.86	1.34	4.43
10/12/03 08:15	3.01	799.01	0.85	1.31	10.14	806.14	0.86	1.34	4.43
10/12/03 08:20	3.01	799.01	0.85	1.31	10.14	806.14	0.86	1.33	4.43
10/12/03 08:25	3.01	799.01	0.85	1.31	10.14	806.14	0.86	1.33	4.43
10/12/03 08:30	3.01	799.01	0.84	1.31	10.14	806.14	0.86	1.33	4.43
10/12/03 08:35	3.01	799.01	0.84	1.31	10.14	806.14	0.86	1.33	4.42
10/12/03 08:40	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.42
10/12/03 08:45	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.42
10/12/03 08:50	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.33	4.42
10/12/03 08:55	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.32	4.42
10/12/03 09:00	3.01	799.01	0.84	1.30	10.14	806.14	0.86	1.32	4.42
10/12/03 09:05	3.01	799.01	0.84	1.30	10.14	806.14	0.85	1.32	4.42
10/12/03 09:10	3.01	799.01	0.84	1.30	10.14	806.14	0.85	1.32	4.42
10/12/03 09:15	3.01	799.01	0.84	1.30	10.14	806.14	0.85	1.32	4.42
10/12/03 09:20	3.01	799.01	0.84	1.29	10.14	806.14	0.85	1.32	4.41
10/12/03 09:25	3.01	799.01	0.84	1.29	10.14	806.14	0.85	1.32	4.41
10/12/03 09:30	3.01	799.01	0.84	1.29	10.14	806.14	0.85	1.31	4.41
10/12/03 09:35	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.31	4.41
10/12/03 09:40	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.31	4.41
10/12/03 09:45	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.31	4.41
10/12/03 09:50	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.31	4.41
10/12/03 09:55	3.01	799.01	0.83	1.29	10.14	806.14	0.85	1.31	4.41

10/12/03 10:00	3.01	799.01	0.83	1.29	10.14	806.14	0.84	1.31	4.41
10/12/03 10:05	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.31	4.40
10/12/03 10:10	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:15	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:20	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:25	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:30	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:35	3.01	799.01	0.83	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:40	3.01	799.01	0.82	1.28	10.14	806.14	0.84	1.30	4.40
10/12/03 10:45	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.30	4.40
10/12/03 10:50	3.01	799.01	0.82	1.27	10.14	806.14	0.84	1.29	4.40
10/12/03 10:55	3.01	799.01	0.82	1.27	10.13	806.13	0.84	1.29	4.39
10/12/03 11:00	3.01	799.01	0.82	1.27	10.13	806.13	0.84	1.29	4.39
10/12/03 11:05	3.01	799.01	0.82	1.27	10.13	806.13	0.83	1.29	4.39
10/12/03 11:10	3.01	799.01	0.82	1.27	10.13	806.13	0.83	1.29	4.39
10/12/03 11:15	3.01	799.01	0.82	1.27	10.13	806.13	0.83	1.29	4.39
10/12/03 11:20	3.01	799.01	0.82	1.27	10.13	806.13	0.83	1.29	4.39
10/12/03 11:25	3.01	799.01	0.82	1.27	10.13	806.13	0.83	1.29	4.39
10/12/03 11:30	3.01	799.01	0.82	1.26	10.13	806.13	0.83	1.29	4.39
10/12/03 11:35	3.01	799.01	0.82	1.26	10.13	806.13	0.83	1.28	4.39
10/12/03 11:40	3.01	799.01	0.82	1.26	10.13	806.13	0.83	1.28	4.38
10/12/03 11:45	3.01	799.01	0.81	1.26	10.13	806.13	0.83	1.28	4.38
10/12/03 11:50	3.01	799.01	0.81	1.26	10.13	806.13	0.83	1.28	4.38
10/12/03 11:55	3.01	799.01	0.81	1.26	10.13	806.13	0.83	1.28	4.38
10/12/03 12:00	3.01	799.01	0.81	1.26	10.13	806.13	0.83	1.28	4.38
10/12/03 12:05	3.01	799.01	0.81	1.26	10.13	806.13	0.83	1.28	4.38
10/12/03 12:10	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.28	4.38
10/12/03 12:15	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.38
10/12/03 12:20	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.38
10/12/03 12:25	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.38
10/12/03 12:30	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.37
10/12/03 12:35	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.37
10/12/03 12:40	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.37
10/12/03 12:45	3.01	799.01	0.81	1.25	10.13	806.13	0.82	1.27	4.37
10/12/03 12:50	3.01	799.01	0.80	1.25	10.13	806.13	0.82	1.27	4.37
10/12/03 12:55	3.01	799.01	0.80	1.24	10.13	806.13	0.82	1.26	4.37
10/12/03 13:00	3.01	799.01	0.80	1.24	10.13	806.13	0.82	1.26	4.37
10/12/03 13:05	3.01	799.01	0.80	1.24	10.13	806.13	0.82	1.26	4.37
10/12/03 13:10	3.01	799.01	0.80	1.24	10.13	806.13	0.82	1.26	4.37
10/12/03 13:15	3.01	799.01	0.80	1.24	10.13	806.13	0.81	1.26	4.37
10/12/03 13:20	3.01	799.01	0.80	1.24	10.13	806.13	0.81	1.26	4.36
10/12/03 13:25	3.01	799.01	0.80	1.24	10.13	806.13	0.81	1.26	4.36
10/12/03 13:30	3.01	799.01	0.80	1.24	10.13	806.13	0.81	1.26	4.36
10/12/03 13:35	3.01	799.01	0.80	1.23	10.13	806.13	0.81	1.26	4.36
10/12/03 13:40	3.01	799.01	0.80	1.23	10.13	806.13	0.81	1.25	4.36
10/12/03 13:45	3.01	799.01	0.80	1.23	10.13	806.13	0.81	1.25	4.36
10/12/03 13:50	3.01	799.01	0.80	1.23	10.13	806.13	0.81	1.25	4.36
10/12/03 13:55	3.01	799.01	0.80	1.23	10.13	806.13	0.81	1.25	4.36
10/12/03 14:00	3.01	799.01	0.79	1.23	10.13	806.13	0.81	1.25	4.36
10/12/03 14:05	3.01	799.01	0.79	1.23	10.13	806.13	0.81	1.25	4.35
10/12/03 14:10	3.01	799.01	0.79	1.23	10.13	806.13	0.81	1.25	4.35
10/12/03 14:15	3.01	799.01	0.79	1.23	10.13	806.13	0.81	1.25	4.35
10/12/03 14:20	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:25	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:30	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:35	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:40	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:45	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:50	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.35
10/12/03 14:55	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.34
10/12/03 15:00	3.01	799.01	0.79	1.22	10.13	806.13	0.80	1.24	4.34
10/12/03 15:05	3.01	799.01	0.78	1.21	10.13	806.13	0.80	1.23	4.34
10/12/03 15:10	3.01	799.01	0.78	1.21	10.13	806.13	0.80	1.23	4.34
10/12/03 15:15	3.01	799.01	0.78	1.21	10.13	806.13	0.80	1.23	4.34
10/12/03 15:20	3.01	799.01	0.78	1.21	10.13	806.13	0.80	1.23	4.34
10/12/03 15:25	3.01	799.01	0.78	1.21	10.13	806.13	0.79	1.23	4.34
10/12/03 15:30	3.01	799.01	0.78	1.21	10.13	806.13	0.79	1.23	4.34
10/12/03 15:35	3.01	799.01	0.78	1.21	10.13	806.13	0.79	1.23	4.34

10/12/03 15:40	3.01	799.01	0.78	1.21	10.13	806.13	0.79	1.23	4.34
10/12/03 15:45	3.01	799.01	0.78	1.20	10.13	806.13	0.79	1.23	4.33
10/12/03 15:50	3.01	799.01	0.78	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 15:55	3.01	799.01	0.78	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:00	3.01	799.01	0.78	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:05	3.01	799.01	0.78	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:10	3.01	799.01	0.77	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:15	3.01	799.01	0.77	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:20	3.01	799.01	0.77	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:25	3.01	799.01	0.77	1.20	10.13	806.13	0.79	1.22	4.33
10/12/03 16:30	3.01	799.01	0.77	1.19	10.13	806.13	0.79	1.21	4.32
10/12/03 16:35	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 16:40	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 16:45	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 16:50	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 16:55	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 17:00	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 17:05	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 17:10	3.01	799.01	0.77	1.19	10.13	806.13	0.78	1.21	4.32
10/12/03 17:15	3.01	799.01	0.77	1.18	10.13	806.13	0.78	1.20	4.32
10/12/03 17:20	3.01	799.01	0.76	1.18	10.13	806.13	0.78	1.20	4.31
10/12/03 17:25	3.01	799.01	0.76	1.18	10.13	806.13	0.78	1.20	4.31
10/12/03 17:30	3.01	799.01	0.76	1.18	10.13	806.13	0.78	1.20	4.31
10/12/03 17:35	3.01	799.01	0.76	1.18	10.13	806.13	0.78	1.20	4.31
10/12/03 17:40	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.20	4.31
10/12/03 17:45	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.20	4.31
10/12/03 17:50	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.20	4.31
10/12/03 17:55	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.20	4.31
10/12/03 18:00	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.19	4.31
10/12/03 18:05	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.19	4.31
10/12/03 18:10	3.01	799.01	0.76	1.18	10.13	806.13	0.77	1.19	4.30
10/12/03 18:15	3.01	799.01	0.76	1.17	10.13	806.13	0.77	1.19	4.30
10/12/03 18:20	3.01	799.01	0.76	1.17	10.13	806.13	0.77	1.19	4.30
10/12/03 18:25	3.01	799.01	0.76	1.17	10.13	806.13	0.77	1.19	4.30
10/12/03 18:30	3.01	799.01	0.76	1.17	10.13	806.13	0.77	1.19	4.30
10/12/03 18:35	3.01	799.01	0.75	1.17	10.13	806.13	0.77	1.19	4.30
10/12/03 18:40	3.01	799.01	0.75	1.17	10.13	806.13	0.77	1.19	4.30
10/12/03 18:45	3.01	799.01	0.75	1.16	10.13	806.13	0.77	1.18	4.30
10/12/03 18:50	3.01	799.01	0.75	1.16	10.13	806.13	0.76	1.18	4.30
10/12/03 18:55	3.01	799.01	0.75	1.16	10.13	806.13	0.76	1.18	4.30
10/12/03 19:00	3.01	799.01	0.75	1.16	10.13	806.13	0.76	1.18	4.29
10/12/03 19:05	3.01	799.01	0.75	1.16	10.13	806.13	0.76	1.18	4.29
10/12/03 19:10	3.01	799.01	0.75	1.16	10.13	806.13	0.76	1.18	4.29
10/12/03 19:15	3.01	799.01	0.75	1.16	10.13	806.13	0.76	1.18	4.29
10/12/03 19:20	3.01	799.01	0.75	1.15	10.13	806.13	0.76	1.18	4.29
10/12/03 19:25	3.01	799.01	0.75	1.15	10.13	806.13	0.76	1.17	4.29
10/12/03 19:30	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.17	4.29
10/12/03 19:35	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.17	4.29
10/12/03 19:40	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.17	4.29
10/12/03 19:45	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.17	4.28
10/12/03 19:50	3.01	799.01	0.74	1.15	10.13	806.13	0.76	1.17	4.28
10/12/03 19:55	3.01	799.01	0.74	1.15	10.13	806.13	0.75	1.17	4.28
10/12/03 20:00	3.01	799.01	0.74	1.15	10.13	806.13	0.75	1.17	4.28
10/12/03 20:05	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.17	4.28
10/12/03 20:10	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.16	4.28
10/12/03 20:15	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.16	4.28
10/12/03 20:20	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.16	4.28
10/12/03 20:25	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.16	4.27
10/12/03 20:30	3.01	799.01	0.74	1.14	10.13	806.13	0.75	1.16	4.27
10/12/03 20:35	3.01	799.01	0.73	1.14	10.13	806.13	0.75	1.16	4.27
10/12/03 20:40	3.01	799.01	0.73	1.14	10.13	806.13	0.75	1.16	4.27
10/12/03 20:45	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.16	4.27
10/12/03 20:50	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.15	4.27
10/12/03 20:55	3.01	799.01	0.73	1.13	10.13	806.13	0.75	1.15	4.27
10/12/03 21:00	3.01	799.01	0.73	1.13	10.12	806.12	0.74	1.15	4.27
10/12/03 21:05	3.01	799.01	0.73	1.13	10.12	806.12	0.74	1.15	4.27
10/12/03 21:10	3.01	799.01	0.73	1.13	10.12	806.12	0.74	1.15	4.26
10/12/03 21:15	3.01	799.01	0.73	1.13	10.12	806.12	0.74	1.15	4.26

10/12/03 21:20	3.01	799.01	0.73	1.13	10.12	806.12	0.74	1.15	4.26
10/12/03 21:25	3.01	799.01	0.73	1.13	10.12	806.12	0.74	1.15	4.26
10/12/03 21:30	3.01	799.01	0.73	1.12	10.12	806.12	0.74	1.15	4.26
10/12/03 21:35	3.01	799.01	0.73	1.12	10.12	806.12	0.74	1.14	4.26
10/12/03 21:40	3.01	799.01	0.73	1.12	10.12	806.12	0.74	1.14	4.26
10/12/03 21:45	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.26
10/12/03 21:50	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.26
10/12/03 21:55	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.25
10/12/03 22:00	3.01	799.01	0.72	1.12	10.12	806.12	0.74	1.14	4.25
10/12/03 22:05	3.01	799.01	0.72	1.12	10.12	806.12	0.73	1.14	4.25
10/12/03 22:10	3.01	799.01	0.72	1.12	10.12	806.12	0.73	1.14	4.25
10/12/03 22:15	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 22:20	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 22:25	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 22:30	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 22:35	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.25
10/12/03 22:40	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.24
10/12/03 22:45	3.01	799.01	0.72	1.11	10.12	806.12	0.73	1.13	4.24
10/12/03 22:50	3.01	799.01	0.71	1.11	10.12	806.12	0.73	1.13	4.24
10/12/03 22:55	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.13	4.24
10/12/03 23:00	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/12/03 23:05	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/12/03 23:10	3.01	799.01	0.71	1.10	10.12	806.12	0.73	1.12	4.24
10/12/03 23:15	3.01	799.01	0.71	1.10	10.12	806.12	0.72	1.12	4.24
10/12/03 23:20	3.01	799.01	0.71	1.10	10.12	806.12	0.72	1.12	4.24
10/12/03 23:25	3.01	799.01	0.71	1.10	10.12	806.12	0.72	1.12	4.23
10/12/03 23:30	3.01	799.01	0.71	1.10	10.12	806.12	0.72	1.12	4.23
10/12/03 23:35	3.01	799.01	0.71	1.10	10.12	806.12	0.72	1.12	4.23
10/12/03 23:40	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.12	4.23
10/12/03 23:45	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.11	4.23
10/12/03 23:50	3.01	799.01	0.71	1.09	10.12	806.12	0.72	1.11	4.23
10/12/03 23:55	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/13/03 00:00	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/13/03 00:05	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.23
10/13/03 00:10	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.22
10/13/03 00:15	3.01	799.01	0.70	1.09	10.12	806.12	0.72	1.11	4.22
10/13/03 00:20	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.11	4.22
10/13/03 00:25	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/13/03 00:30	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/13/03 00:35	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/13/03 00:40	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/13/03 00:45	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/13/03 00:50	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.22
10/13/03 00:55	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.21
10/13/03 01:00	3.01	799.01	0.70	1.08	10.12	806.12	0.71	1.10	4.21
10/13/03 01:05	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.10	4.21
10/13/03 01:10	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/13/03 01:15	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/13/03 01:20	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/13/03 01:25	3.01	799.01	0.69	1.07	10.12	806.12	0.71	1.09	4.21
10/13/03 01:30	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.21
10/13/03 01:35	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.21
10/13/03 01:40	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/13/03 01:45	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/13/03 01:50	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/13/03 01:55	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.09	4.20
10/13/03 02:00	3.01	799.01	0.69	1.07	10.12	806.12	0.70	1.08	4.20
10/13/03 02:05	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.08	4.20
10/13/03 02:10	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.08	4.20
10/13/03 02:15	3.01	799.01	0.69	1.06	10.12	806.12	0.70	1.08	4.20
10/13/03 02:20	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.20
10/13/03 02:25	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.19
10/13/03 02:30	3.01	799.01	0.68	1.06	10.12	806.12	0.70	1.08	4.19
10/13/03 02:35	3.01	799.01	0.68	1.05	10.12	806.12	0.70	1.08	4.19
10/13/03 02:40	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/13/03 02:45	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/13/03 02:50	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/13/03 02:55	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19

10/13/03 03:00	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.19
10/13/03 03:05	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.18
10/13/03 03:10	3.01	799.01	0.68	1.05	10.12	806.12	0.69	1.07	4.18
10/13/03 03:15	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.07	4.18
10/13/03 03:20	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/13/03 03:25	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/13/03 03:30	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/13/03 03:35	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.18
10/13/03 03:40	3.01	799.01	0.67	1.04	10.12	806.12	0.69	1.06	4.17
10/13/03 03:45	3.01	799.01	0.67	1.04	10.12	806.12	0.68	1.06	4.17
10/13/03 03:50	3.01	799.01	0.67	1.04	10.12	806.12	0.68	1.06	4.17
10/13/03 03:55	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.06	4.17
10/13/03 04:00	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.06	4.17
10/13/03 04:05	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.17
10/13/03 04:10	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.17
10/13/03 04:15	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.16
10/13/03 04:20	3.01	799.01	0.67	1.03	10.12	806.12	0.68	1.05	4.16
10/13/03 04:25	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/13/03 04:30	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/13/03 04:35	3.01	799.01	0.66	1.03	10.12	806.12	0.68	1.05	4.16
10/13/03 04:40	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.05	4.16
10/13/03 04:45	3.01	799.01	0.66	1.02	10.12	806.12	0.68	1.04	4.16
10/13/03 04:50	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 04:55	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 05:00	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 05:05	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 05:10	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 05:15	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 05:20	3.01	799.01	0.66	1.02	10.12	806.12	0.67	1.04	4.15
10/13/03 05:25	3.01	799.01	0.66	1.01	10.12	806.12	0.67	1.04	4.14
10/13/03 05:30	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/13/03 05:35	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/13/03 05:40	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/13/03 05:45	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/13/03 05:50	3.01	799.01	0.65	1.01	10.12	806.12	0.67	1.03	4.14
10/13/03 05:55	3.01	799.01	0.65	1.01	10.12	806.12	0.66	1.03	4.14
10/13/03 06:00	3.01	799.01	0.65	1.01	10.12	806.12	0.66	1.03	4.13
10/13/03 06:05	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.03	4.13
10/13/03 06:10	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/13/03 06:15	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/13/03 06:20	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/13/03 06:25	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/13/03 06:30	3.01	799.01	0.65	1.00	10.12	806.12	0.66	1.02	4.13
10/13/03 06:35	3.01	799.01	0.64	1.00	10.12	806.12	0.66	1.02	4.12
10/13/03 06:40	3.01	799.01	0.64	1.00	10.12	806.12	0.66	1.02	4.12
10/13/03 06:45	3.01	799.01	0.64	1.00	10.11	806.11	0.66	1.02	4.12
10/13/03 06:50	3.01	799.01	0.64	0.99	10.11	806.11	0.66	1.02	4.12
10/13/03 06:55	3.01	799.01	0.64	0.99	10.11	806.11	0.66	1.01	4.12
10/13/03 07:00	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.12
10/13/03 07:05	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.12
10/13/03 07:10	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/13/03 07:15	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/13/03 07:20	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/13/03 07:25	3.01	799.01	0.64	0.99	10.11	806.11	0.65	1.01	4.11
10/13/03 07:30	3.01	799.01	0.64	0.98	10.11	806.11	0.65	1.01	4.11
10/13/03 07:35	3.01	799.01	0.64	0.98	10.11	806.11	0.65	1.01	4.11
10/13/03 07:40	3.01	799.01	0.64	0.98	10.11	806.11	0.65	1.00	4.11
10/13/03 07:45	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.11
10/13/03 07:50	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/13/03 07:55	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/13/03 08:00	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/13/03 08:05	3.01	799.01	0.63	0.98	10.11	806.11	0.65	1.00	4.10
10/13/03 08:10	3.01	799.01	0.63	0.98	10.11	806.11	0.64	1.00	4.10
10/13/03 08:15	3.01	799.01	0.63	0.97	10.11	806.11	0.64	1.00	4.10
10/13/03 08:20	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.10
10/13/03 08:25	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/13/03 08:30	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/13/03 08:35	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09

10/13/03 08:40	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/13/03 08:45	3.01	799.01	0.63	0.97	10.11	806.11	0.64	0.99	4.09
10/13/03 08:50	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/13/03 08:55	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.09
10/13/03 09:00	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.99	4.08
10/13/03 09:05	3.01	799.01	0.62	0.96	10.11	806.11	0.64	0.98	4.08
10/13/03 09:10	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.98	4.08
10/13/03 09:15	3.01	799.01	0.62	0.97	10.11	806.11	0.64	0.98	4.08
10/13/03 09:20	3.01	799.01	0.62	0.97	10.11	806.11	0.63	0.98	4.08
10/13/03 09:25	3.01	799.01	0.62	0.97	10.11	806.11	0.63	0.98	4.08
10/13/03 09:30	3.01	799.01	0.62	0.97	10.11	806.11	0.63	0.98	4.08
10/13/03 09:35	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/13/03 09:40	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.08
10/13/03 09:45	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/13/03 09:50	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/13/03 09:55	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.98	4.07
10/13/03 10:00	3.01	799.01	0.62	0.96	10.11	806.11	0.63	0.97	4.07
10/13/03 10:05	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.97	4.07
10/13/03 10:10	3.01	799.01	0.62	0.95	10.11	806.11	0.63	0.97	4.07
10/13/03 10:15	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.07
10/13/03 10:20	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.06
10/13/03 10:25	3.01	799.01	0.61	0.95	10.11	806.11	0.63	0.97	4.06
10/13/03 10:30	3.01	799.01	0.61	0.94	10.11	806.11	0.63	0.97	4.06
10/13/03 10:35	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/13/03 10:40	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.97	4.06
10/13/03 10:45	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.06
10/13/03 10:50	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/13/03 10:55	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/13/03 11:00	3.01	799.01	0.61	0.94	10.11	806.11	0.62	0.96	4.05
10/13/03 11:05	3.01	799.01	0.60	0.94	10.11	806.11	0.62	0.96	4.05
10/13/03 11:10	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/13/03 11:15	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/13/03 11:20	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.96	4.05
10/13/03 11:25	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/13/03 11:30	3.01	799.01	0.60	0.93	10.11	806.11	0.62	0.95	4.04
10/13/03 11:35	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/13/03 11:40	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/13/03 11:45	3.01	799.01	0.60	0.93	10.11	806.11	0.61	0.95	4.04
10/13/03 11:50	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.04
10/13/03 11:55	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.03
10/13/03 12:00	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.95	4.03
10/13/03 12:05	3.01	799.01	0.60	0.92	10.11	806.11	0.61	0.94	4.03
10/13/03 12:10	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/13/03 12:15	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/13/03 12:20	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.03
10/13/03 12:25	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/13/03 12:30	3.01	799.01	0.59	0.92	10.11	806.11	0.61	0.94	4.02
10/13/03 12:35	3.01	799.01	0.59	0.91	10.11	806.11	0.61	0.94	4.02
10/13/03 12:40	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.94	4.02
10/13/03 12:45	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/13/03 12:50	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/13/03 12:55	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.02
10/13/03 13:00	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/13/03 13:05	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/13/03 13:10	3.01	799.01	0.59	0.91	10.11	806.11	0.60	0.93	4.01
10/13/03 13:15	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/13/03 13:20	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/13/03 13:25	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.93	4.01
10/13/03 13:30	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/13/03 13:35	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/13/03 13:40	3.01	799.01	0.58	0.90	10.11	806.11	0.60	0.92	4.00
10/13/03 13:45	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/13/03 13:50	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/13/03 13:55	3.01	799.01	0.58	0.90	10.11	806.11	0.59	0.92	4.00
10/13/03 14:00	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.92	4.00
10/13/03 14:05	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.92	3.99
10/13/03 14:10	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/13/03 14:15	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99

10/13/03 14:20	3.01	799.01	0.58	0.89	10.11	806.11	0.59	0.91	3.99
10/13/03 14:25	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.99
10/13/03 14:30	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.99
10/13/03 14:35	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 14:40	3.01	799.01	0.57	0.89	10.11	806.11	0.59	0.91	3.98
10/13/03 14:45	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.98
10/13/03 14:50	3.01	799.01	0.57	0.88	10.11	806.11	0.59	0.91	3.98
10/13/03 14:55	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/13/03 15:00	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/13/03 15:05	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.98
10/13/03 15:10	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 15:15	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 15:20	3.01	799.01	0.57	0.88	10.11	806.11	0.58	0.90	3.97
10/13/03 15:25	3.01	799.01	0.57	0.87	10.11	806.11	0.58	0.90	3.97
10/13/03 15:30	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.90	3.97
10/13/03 15:35	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.97
10/13/03 15:40	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 15:45	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 15:50	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 15:55	3.01	799.01	0.56	0.87	10.11	806.11	0.58	0.89	3.96
10/13/03 16:00	3.01	799.01	0.56	0.87	10.11	806.11	0.57	0.89	3.96
10/13/03 16:05	3.01	799.01	0.56	0.87	10.10	806.10	0.57	0.89	3.96
10/13/03 16:10	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.89	3.95
10/13/03 16:15	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.89	3.95
10/13/03 16:20	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 16:25	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 16:30	3.01	799.01	0.56	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 16:35	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 16:40	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.95
10/13/03 16:45	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/13/03 16:50	3.01	799.01	0.55	0.86	10.10	806.10	0.57	0.88	3.94
10/13/03 16:55	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.94
10/13/03 17:00	3.01	799.01	0.55	0.85	10.10	806.10	0.57	0.88	3.94
10/13/03 17:05	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.94
10/13/03 17:10	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.94
10/13/03 17:15	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 17:20	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 17:25	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 17:30	3.01	799.01	0.55	0.85	10.10	806.10	0.56	0.87	3.93
10/13/03 17:35	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.87	3.93
10/13/03 17:40	3.01	799.01	0.55	0.84	10.10	806.10	0.56	0.87	3.93
10/13/03 17:45	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 17:50	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 17:55	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 18:00	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 18:05	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 18:10	3.01	799.01	0.54	0.84	10.10	806.10	0.56	0.86	3.92
10/13/03 18:15	3.01	799.01	0.54	0.84	10.10	806.10	0.55	0.86	3.91
10/13/03 18:20	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.86	3.91
10/13/03 18:25	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.86	3.91
10/13/03 18:30	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 18:35	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 18:40	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.91
10/13/03 18:45	3.01	799.01	0.54	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 18:50	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 18:55	3.01	799.01	0.53	0.83	10.10	806.10	0.55	0.85	3.90
10/13/03 19:00	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.85	3.90
10/13/03 19:05	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.85	3.90
10/13/03 19:10	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.85	3.90
10/13/03 19:15	3.01	799.01	0.53	0.82	10.10	806.10	0.55	0.84	3.89
10/13/03 19:20	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 19:25	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 19:30	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 19:35	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 19:40	3.01	799.01	0.53	0.82	10.10	806.10	0.54	0.84	3.89
10/13/03 19:45	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.84	3.88
10/13/03 19:50	3.01	799.01	0.53	0.81	10.10	806.10	0.54	0.84	3.88
10/13/03 19:55	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88

10/13/03 20:00	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 20:05	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 20:10	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.88
10/13/03 20:15	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/13/03 20:20	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/13/03 20:25	3.01	799.01	0.52	0.81	10.10	806.10	0.54	0.83	3.87
10/13/03 20:30	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.83	3.87
10/13/03 20:35	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.83	3.87
10/13/03 20:40	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.87
10/13/03 20:45	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 20:50	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 20:55	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 21:00	3.01	799.01	0.52	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 21:05	3.01	799.01	0.51	0.80	10.10	806.10	0.53	0.82	3.86
10/13/03 21:10	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.82	3.86
10/13/03 21:15	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.82	3.85
10/13/03 21:20	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.82	3.85
10/13/03 21:25	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.81	3.85
10/13/03 21:30	3.01	799.01	0.51	0.79	10.10	806.10	0.53	0.81	3.85
10/13/03 21:35	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/13/03 21:40	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.85
10/13/03 21:45	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 21:50	3.01	799.01	0.51	0.79	10.10	806.10	0.52	0.81	3.84
10/13/03 21:55	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.81	3.84
10/13/03 22:00	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.81	3.84
10/13/03 22:05	3.01	799.01	0.51	0.78	10.10	806.10	0.52	0.80	3.84
10/13/03 22:10	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.84
10/13/03 22:15	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 22:20	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 22:25	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 22:30	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 22:35	3.01	799.01	0.50	0.78	10.10	806.10	0.52	0.80	3.83
10/13/03 22:40	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.80	3.83
10/13/03 22:45	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.80	3.82
10/13/03 22:50	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 22:55	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 23:00	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.82
10/13/03 23:05	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 23:10	3.01	799.01	0.50	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 23:15	3.01	799.01	0.49	0.77	10.10	806.10	0.51	0.79	3.81
10/13/03 23:20	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/13/03 23:25	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.81
10/13/03 23:30	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.79	3.80
10/13/03 23:35	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 23:40	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 23:45	3.01	799.01	0.49	0.76	10.10	806.10	0.51	0.78	3.80
10/13/03 23:50	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80
10/13/03 23:55	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80
10/14/03 00:00	3.01	799.01	0.49	0.76	10.10	806.10	0.50	0.78	3.80

EMERGENCY SPILLWAY CALCULATION

EMERGENCY SPILLWAY CALCULATION
PREPARED BY: EJB 10-18-2019
CHECK BY: CLR 10-21-2019

Summary for Pond P-1: Panther Hollow Lake

Inflow = 327.60 cfs @ 84.17 hrs, Volume= 44.212 af
Outflow = 47.37 cfs @ 85.86 hrs, Volume= 24.255 af, Atten= 86%, Lag= 101.6 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 47.37 cfs @ 85.86 hrs, Volume= 24.255 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 3
Starting Elev= 806.00' Surf.Area= 81,556 sf Storage= 415,213 cf
Peak Elev= 813.80' @ 85.86 hrs Surf.Area= 188,933 sf Storage= 1,419,547 cf (1,004,334 cf above start)

Plug-Flow detention time= 1,643.9 min calculated for 14.722 af (33% of inflow)
Center-of-Mass det. time= 503.0 min (6,081.7 - 5,578.6)

Volume	Invert	Avail.Storage	Storage Description
#1	796.00'	1,457,493 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
796.00	21,779	0	0
797.00	24,555	23,167	23,167
798.00	27,469	26,012	49,179
799.00	32,661	30,065	79,244
800.00	37,328	34,995	114,239
801.00	40,956	39,142	153,381
802.00	44,485	42,721	196,101
803.00	48,124	46,305	242,406
804.00	51,995	50,060	292,465
805.00	55,972	53,984	346,449
806.00	81,556	68,764	415,213
807.00	90,762	86,159	501,372
808.00	99,242	95,002	596,374
809.00	117,908	108,575	704,949
810.00	129,891	123,900	828,848
811.00	144,763	137,327	966,175
812.00	152,312	148,538	1,114,713
813.00	169,789	161,051	1,275,763
814.00	193,670	181,730	1,457,493

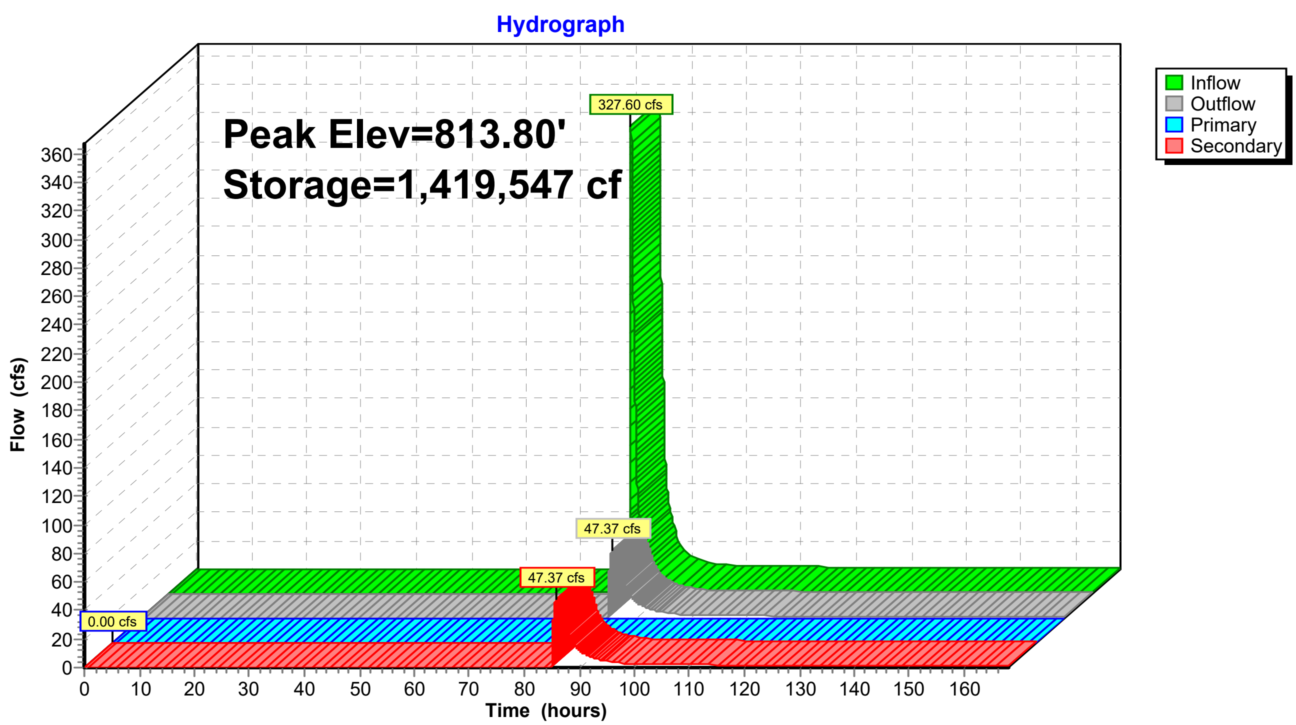
Device	Routing	Invert	Outlet Devices
#1	Primary	788.96'	**30.0" Round Culvert X 0.00** L= 28.0' Ke= 0.500 Inlet / Outlet Invert= 788.96' / 788.00' S= 0.0343 '/' Cc= 0.900 n= 0.010, Flow Area= 4.91 sf
#2	Device 1	792.70'	**30.0" Round Culvert** L= 101.0' Ke= 0.500 Inlet / Outlet Invert= 792.70' / 788.97' S= 0.0369 '/' Cc= 0.900 n= 0.010, Flow Area= 4.91 sf
#3	Device 2	796.56'	**30.0" Round Culvert** L= 181.0' Ke= 0.500 Inlet / Outlet Invert= 796.56' / 793.84' S= 0.0150 '/' Cc= 0.900 n= 0.010, Flow Area= 4.91 sf
#4	Device 3	796.79'	**30.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 796.79' / 796.56' S= 0.0153 '/' Cc= 0.900

			n= 0.010, Flow Area= 4.91 sf
#5	Device 4	798.47'	**30.0" Round Culvert** L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 798.47' / 796.79' S= 0.0150 '/' Cc= 0.900 n= 0.010, Flow Area= 4.91 sf
#6	Device 5	800.00'	**30.0" Round Culvert** L= 112.0' Ke= 0.500 Inlet / Outlet Invert= 800.00' / 798.47' S= 0.0137 '/' Cc= 0.900 n= 0.010, Flow Area= 4.91 sf
#7	Device 6	806.00'	**30.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#8	Secondary	813.00'	**25.0' long x 78.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

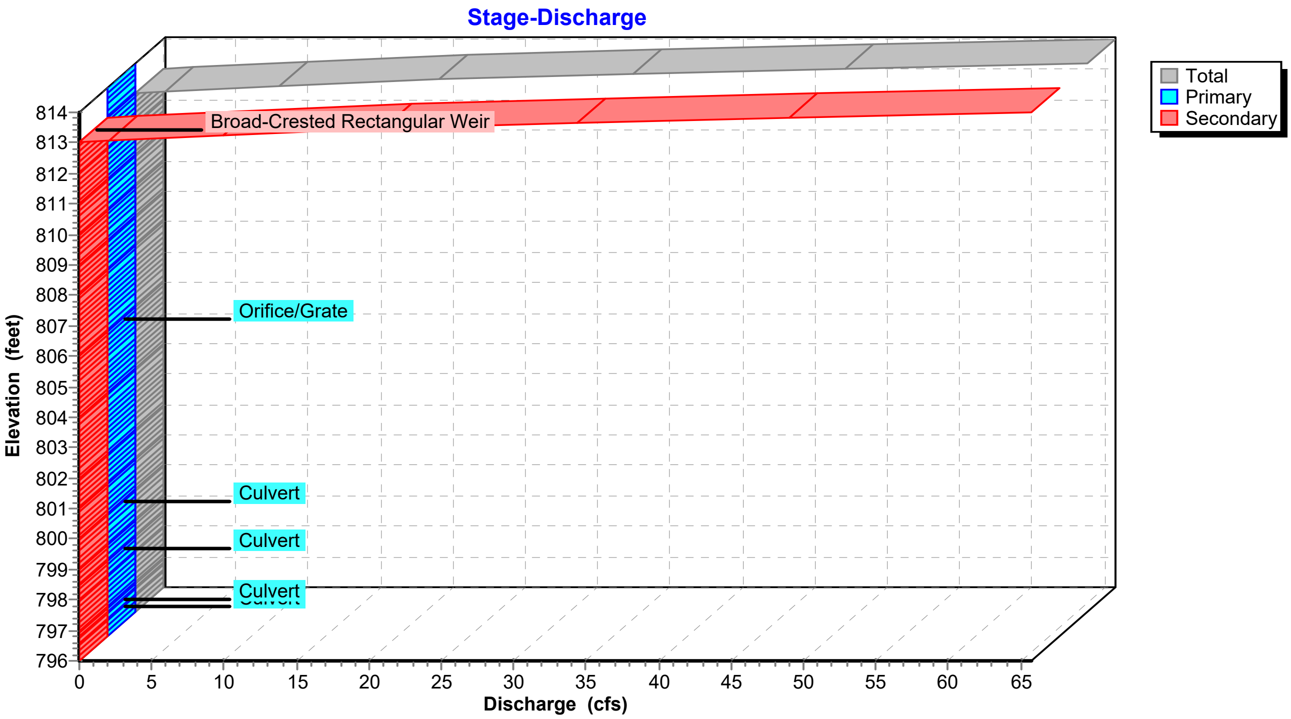
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=806.00' TW=792.01' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)
2=Culvert (Passes 0.00 cfs of 82.05 cfs potential flow)
3=Culvert (Passes 0.00 cfs of 67.64 cfs potential flow)
4=Culvert (Passes 0.00 cfs of 66.68 cfs potential flow)
5=Culvert (Passes 0.00 cfs of 59.23 cfs potential flow)
6=Culvert (Passes 0.00 cfs of 51.51 cfs potential flow)
7=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=47.37 cfs @ 85.86 hrs HW=813.80' TW=793.90' (Dynamic Tailwater)
8=Broad-Crested Rectangular Weir (Weir Controls 47.37 cfs @ 2.36 fps)

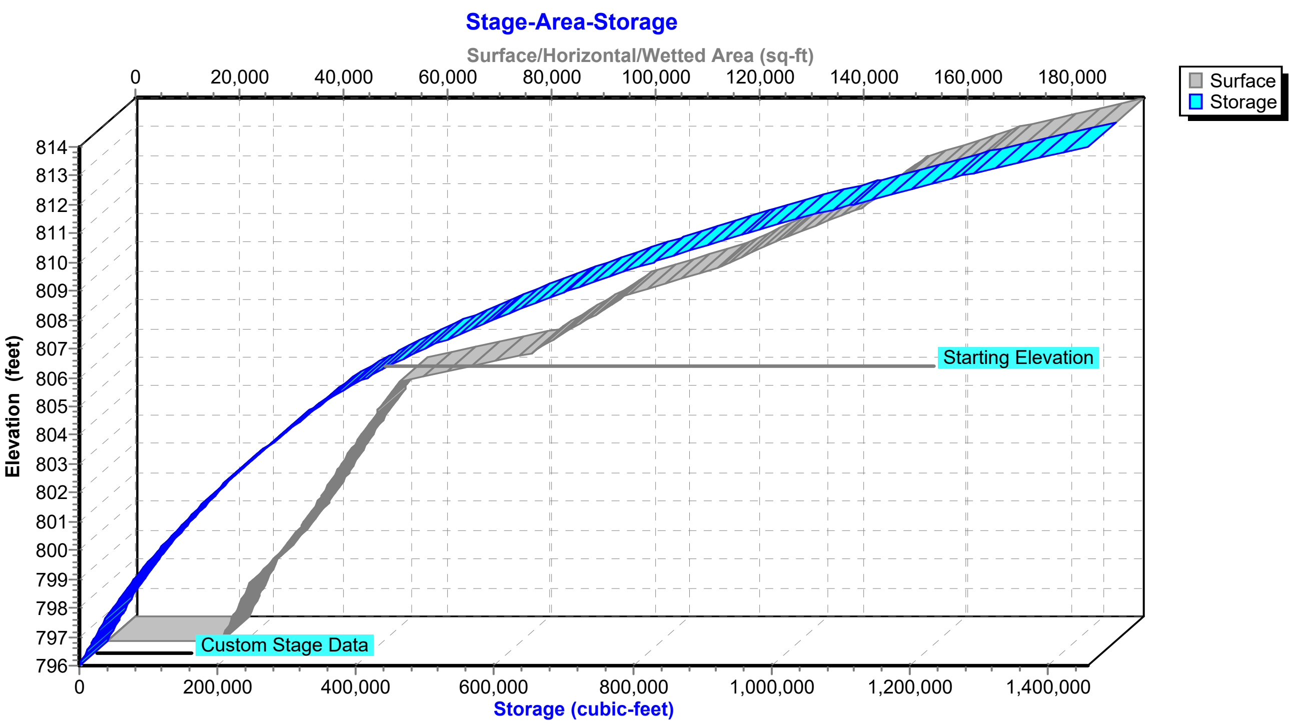
Pond P-1: Panther Hollow Lake



Pond P-1: Panther Hollow Lake



Pond P-1: Panther Hollow Lake



Hydrograph for Pond P-1: Panther Hollow Lake

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	415,213	806.00	0.00	**0.00**	0.00
5.00	0.00	415,213	806.00	0.00	0.00	0.00
10.00	0.00	415,213	806.00	0.00	0.00	0.00
15.00	0.00	415,213	806.00	0.00	0.00	0.00
20.00	0.00	415,213	806.00	0.00	0.00	0.00
25.00	0.00	415,213	806.00	0.00	0.00	0.00
30.00	0.00	415,213	806.00	0.00	0.00	0.00
35.00	0.00	415,213	806.00	0.00	0.00	0.00
40.00	0.00	415,213	806.00	0.00	0.00	0.00
45.00	0.00	415,213	806.00	0.00	0.00	0.00
50.00	0.09	415,561	806.00	0.00	0.00	0.00
55.00	0.12	417,595	806.03	0.00	0.00	0.00
60.00	0.12	419,695	806.05	0.00	0.00	0.00
65.00	0.12	421,794	806.08	0.00	0.00	0.00
70.00	0.12	423,893	806.11	0.00	0.00	0.00
75.00	0.39	426,783	806.14	0.00	0.00	0.00
80.00	**1.58**	442,875	806.33	0.00	0.00	0.00
85.00	**120.80**	**1,312,382**	**813.21**	**6.57**	0.00	**6.57**
90.00	9.33	**1,331,265**	**813.32**	**12.17**	0.00	**12.17**
95.00	3.67	1,303,583	813.16	4.37	0.00	4.37
100.00	2.37	1,295,224	813.11	2.57	0.00	2.57
105.00	2.25	1,293,811	813.11	2.30	0.00	2.30
110.00	2.07	1,292,890	813.10	2.12	0.00	2.12
115.00	1.72	1,291,272	813.09	1.83	0.00	1.83
120.00	1.48	1,289,558	813.08	1.54	0.00	1.54
125.00	1.37	1,288,727	813.08	1.40	0.00	1.40
130.00	1.29	1,288,162	813.07	1.31	0.00	1.31
135.00	1.22	1,287,700	813.07	1.24	0.00	1.24
140.00	1.15	1,287,251	813.07	1.17	0.00	1.17
145.00	1.08	1,286,786	813.06	1.10	0.00	1.10
150.00	1.01	1,286,318	813.06	1.03	0.00	1.03
155.00	0.94	1,285,853	813.06	0.97	0.00	0.97
160.00	0.87	1,285,349	813.06	0.89	0.00	0.89
165.00	0.80	1,284,846	813.05	0.83	0.00	0.83

Stage-Discharge for Pond P-1: Panther Hollow Lake

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
796.00	0.00	**0.00**	0.00
796.20	0.00	0.00	0.00
796.40	0.00	0.00	0.00
796.60	0.00	0.00	0.00
796.80	0.00	0.00	0.00
797.00	0.00	0.00	0.00
797.20	0.00	0.00	0.00
797.40	0.00	0.00	0.00
797.60	0.00	0.00	0.00
797.80	0.00	0.00	0.00
798.00	0.00	0.00	0.00
798.20	0.00	0.00	0.00
798.40	0.00	0.00	0.00
798.60	0.00	0.00	0.00
798.80	0.00	0.00	0.00
799.00	0.00	0.00	0.00
799.20	0.00	0.00	0.00
799.40	0.00	0.00	0.00
799.60	0.00	0.00	0.00
799.80	0.00	0.00	0.00
800.00	0.00	0.00	0.00
800.20	0.00	0.00	0.00
800.40	0.00	0.00	0.00
800.60	0.00	0.00	0.00
800.80	0.00	0.00	0.00
801.00	0.00	0.00	0.00
801.20	0.00	0.00	0.00
801.40	0.00	0.00	0.00
801.60	0.00	0.00	0.00
801.80	0.00	0.00	0.00
802.00	0.00	0.00	0.00
802.20	0.00	0.00	0.00
802.40	0.00	0.00	0.00
802.60	0.00	0.00	0.00
802.80	0.00	0.00	0.00
803.00	0.00	0.00	0.00
803.20	0.00	0.00	0.00
803.40	0.00	0.00	0.00
803.60	0.00	0.00	0.00
803.80	0.00	0.00	0.00
804.00	0.00	0.00	0.00
804.20	0.00	0.00	0.00
804.40	0.00	0.00	0.00
804.60	0.00	0.00	0.00
804.80	0.00	0.00	0.00
805.00	0.00	0.00	0.00
805.20	0.00	0.00	0.00
805.40	0.00	0.00	0.00
805.60	0.00	0.00	0.00
805.80	0.00	0.00	0.00
806.00	0.00	0.00	0.00
806.20	0.00	0.00	0.00
806.40	0.00	0.00	0.00
806.60	0.00	0.00	0.00
806.80	0.00	0.00	0.00
807.00	0.00	0.00	0.00
807.20	0.00	0.00	0.00
807.40	0.00	0.00	0.00
807.60	0.00	0.00	0.00
807.80	0.00	0.00	0.00
808.00	0.00	0.00	0.00
808.20	0.00	0.00	0.00
808.40	0.00	0.00	0.00
808.60	0.00	0.00	0.00
808.80	0.00	0.00	0.00
809.00	0.00	0.00	0.00
809.20	0.00	0.00	0.00
809.40	0.00	0.00	0.00
809.60	0.00	0.00	0.00
809.80	0.00	0.00	0.00
810.00	0.00	0.00	0.00
810.20	0.00	0.00	0.00
810.40	0.00	0.00	0.00
810.60	0.00	0.00	0.00
810.80	0.00	0.00	0.00
811.00	0.00	0.00	0.00
811.20	0.00	0.00	0.00
811.40	0.00	0.00	0.00
811.60	0.00	0.00	0.00
811.80	0.00	0.00	0.00
812.00	0.00	0.00	0.00
812.20	0.00	0.00	0.00
812.40	0.00	0.00	0.00
812.60	0.00	0.00	0.00
812.80	0.00	0.00	0.00
813.00	0.00	0.00	0.00
813.20	5.99	0.00	5.99
813.40	17.08	0.00	17.08
813.60	31.37	0.00	31.37
813.80	47.23	0.00	47.23
814.00	**65.75**	0.00	**65.75**

Stage-Area-Storage for Pond P-1: Panther Hollow Lake

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
796.00	21,779	0	806.40	85,238	448,571
796.20	22,334	4,411	806.60	87,080	465,803
796.40	22,889	8,934	806.80	88,921	483,403
796.60	23,445	13,567	807.00	90,762	501,372
796.80	24,000	18,312	807.20	92,458	519,694
797.00	24,555	23,167	807.40	94,154	538,355
797.20	25,138	28,136	807.60	95,850	557,355
797.40	25,721	33,222	807.80	97,546	576,695
797.60	26,303	38,425	808.00	99,242	596,374
797.80	26,886	43,743	808.20	102,975	616,595
798.00	27,469	49,179	808.40	106,708	637,564
798.20	28,507	54,777	808.60	110,442	659,279
798.40	29,546	60,582	808.80	114,175	681,740
798.60	30,584	66,595	809.00	117,908	704,949
798.80	31,623	72,816	809.20	120,305	728,770
799.00	32,661	79,244	809.40	122,701	753,070
799.20	33,594	85,870	809.60	125,098	777,850
799.40	34,528	92,682	809.80	127,494	803,109
799.60	35,461	99,681	810.00	129,891	828,848
799.80	36,395	106,866	810.20	132,865	855,124
800.00	37,328	114,239	810.40	135,840	881,994
800.20	38,054	121,777	810.60	138,814	909,460
800.40	38,779	129,460	810.80	141,789	937,520
800.60	39,505	137,288	811.00	144,763	966,175
800.80	40,230	145,262	811.20	146,273	995,279
801.00	40,956	153,381	811.40	147,783	1,024,684
801.20	41,662	161,642	811.60	149,292	1,054,392
801.40	42,368	170,045	811.80	150,802	1,084,401
801.60	43,073	178,589	812.00	152,312	1,114,713
801.80	43,779	187,275	812.20	155,807	1,145,524
802.00	44,485	196,101	812.40	159,303	1,177,035
802.20	45,213	205,071	812.60	162,798	1,209,246
802.40	45,941	214,186	812.80	166,294	1,242,155
802.60	46,668	223,447	813.00	169,789	1,275,763
802.80	47,396	232,853	813.20	174,565	1,310,198
803.00	48,124	242,406	813.40	179,341	1,345,589
803.20	48,898	252,108	813.60	184,118	1,381,935
803.40	49,672	261,965	813.80	188,894	1,419,236
803.60	50,447	271,977	814.00	**193,670**	**1,457,493**
803.80	51,221	282,143			
804.00	51,995	292,465			
804.20	52,790	302,944			
804.40	53,586	313,581			
804.60	54,381	324,378			
804.80	55,177	335,334			
805.00	55,972	346,449			
805.20	61,089	358,155			
805.40	66,206	370,884			
805.60	71,322	384,637			
805.80	76,439	399,413			
806.00	81,556	415,213			
806.20	83,397	431,708			

EMERGENCY DRAWDOWN PIPE CALCULATION

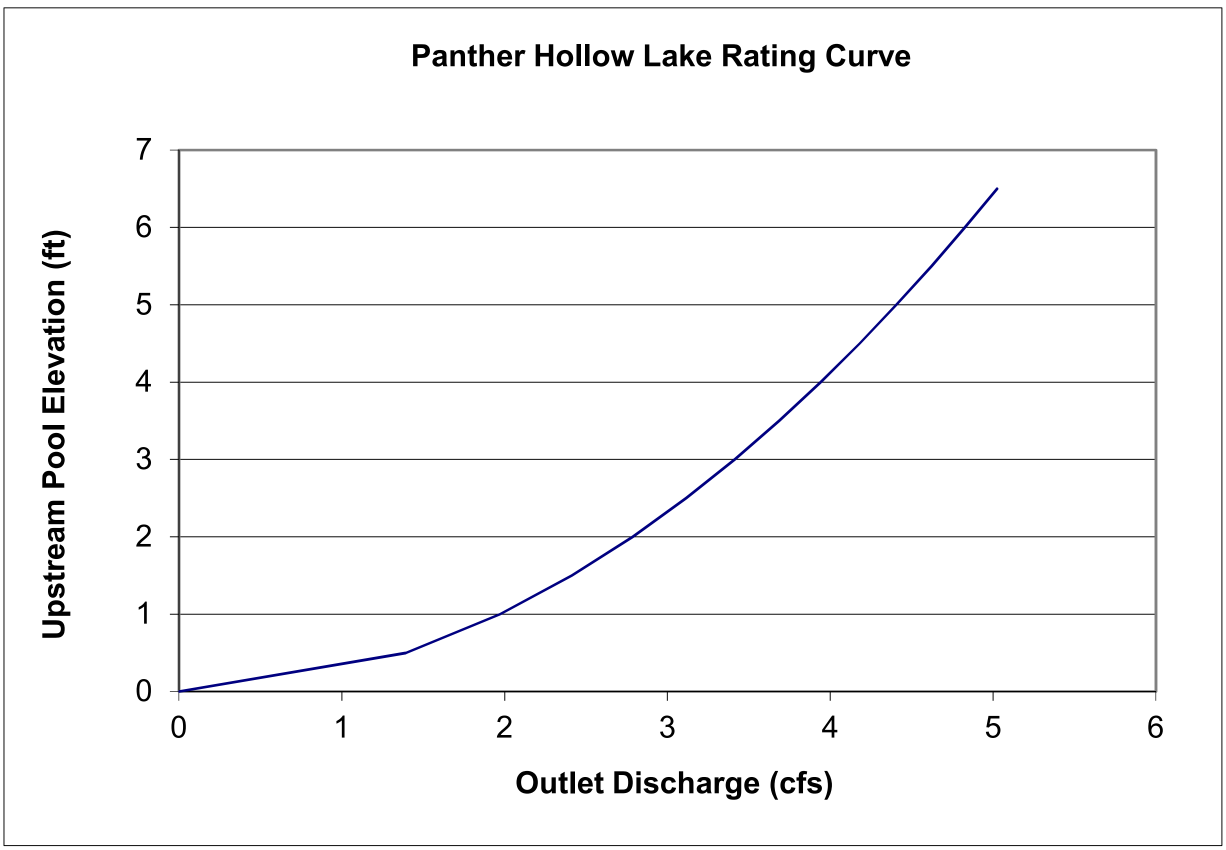
Lake Dewatering Time Data			
PROJECT NAME:	**Four Mile Run Stormwater Improvement Project**		
LOCATION:	**Panther Hollow Lake Dam Rahabilitation**		
PREPARED BY:	**CLR**	DATE:	**10/14/2019**
CHECKED BY:	**JAL**	DATE:	**10/17/2019**
CEC PROJECT #:	**174-960**		

Emergency Emptying Pipe Sizing Analysis		
Flow rate information		
Lake Volume at the crest	414,406.76	cft
Lake Volume 2 ft below crest	292,415.88	cft
Required emptying volume in 24 hr	121,990.88	cft
Rate of Lake emptying	1.41	cfs
Highest mean inflow	2.85	cfs
70% of the highest mean inflow	2.00	cfs
Total flow	3.41	cfs
Required average flow	3.41	cfs
Required emptying volume in 24 hr (including the 70% of the highest mean monthly flow)	294,626.42	cft
Average discharge flow (cfs)	4.83	cfs
Time Required to Empty (hr)	16.96	hr
Time Required to Empty (min)	1017.30	min

Parameter	**Value**	**Reference**		
Conduit				
Number of Equal size outlets	1.000			
Culvert width (ft.)	0.833	ft	10	in
Culvert height (ft.)	0.833			
Culvert area (sq. ft.)	0.545			
Culvert perimeter (ft.)	2.618			
Hydraulic radius (ft.)	0.208			
Mannings "n"	0.011			
Length (ft.)	105.000			
Minor losses				
Entrance loss	0.5			
Gate Valve (fully opened)	0.15			
elbow	0.3			
None	0			
None	0			
None	0			
None	0			
None	0			
None	0			
Exit loss	1	Standard practice		
Total	1.95			
Conduit Losses				
Conduit Losses	2.983			

Upstream Pool (Elevation, ft.)	6
Downstream Pool (Elevation, ft.)	0
Head (ft.)	6
Velocity (ft./sec.)	8.850
Discharge (cfs)	4.83

Upstream Pool (Elevation, ft.)	Velocity (ft./sec)	Discharge Cfs	Elevation relative to the crest	
0	0.00	0.00	-6	
0.5	2.55	1.39	-5.5	
1	3.61	1.97	-5	
1.5	4.43	2.41	-4.5	
2	5.11	2.79	-4	
2.5	5.71	3.12	-3.5	
3	6.26	3.41	-3	
3.5	6.76	3.69	-2.5	
4	7.23	3.94	-2	
4.5	7.66	4.18	-1.5	
5	8.08	4.41	-1	
5.5	8.47	4.62	-0.5	
6	8.85	4.83	0	4.384039421
6.5	9.21	5.02	0.5	



Rainfall Data for Lake Dewatering Calculations

PROJECT NAME:	**Four Mile Run Stormwater Improvement Project**
LOCATION:	**Panther Hollow Lake Dam Rahabilitation**
PREPARED BY:	**CLR** DATE: **10/14/2019**
CHECKED BY:	**JAL** DATE: **10/17/2019**
CEC PROJECT #:	**174-960**

Month		Rain Gauge Location										
		Carnegie Library SQ RG	Childrens Institute RG	CMU RG	Fire Station	Greenfield Giant Eagle	Magee Rec Center RG	Morrowfield Building	Union 95 Bldg	Veterans Pavillion	WQED RG	Average
Jul-18	Total Monthly Rainfall (in)	2.1	2.71	4.99				2.09	1.72		5.16	3.13
	Max. Rainfall, 24-hr storm event (in)	0.85	0.96	2.32				0.77	0.92		2.13	1.33
Aug-18	Total Monthly Rainfall (in)	2.27	2.78	1.01	0.45	2.75	2.69	1.05	2.65	2.55	2.14	2.03
	Max. Rainfall, 24-hr storm event (in)	0.93	1.06	0.83	0.25	0.98	0.92	0.86	0.98	0.88	0.77	0.85
Sep-18	Total Monthly Rainfall (in)	8.78	10.76	11.1	9.4	10.63	10.61	8.3	10.79	10.81	10.73	10.19
	Max. Rainfall, 24-hr storm event (in)	5.79	7.17	7.57	6.92	7.03	7.13	5.12	7.07	7.44	7.51	6.88
Oct-18	Total Monthly Rainfall (in)	3.3	3.67	3.97	3.86	4.27	4.04	2.97	4.3	3.93	4.21	3.85
	Max. Rainfall, 24-hr storm event (in)	1.04	1.06	1.43	1.41	1.49	1.52	0.74	1.54	1.47	1.5	1.32
Nov-18	Total Monthly Rainfall (in)	3.08	3.43	4.28	4.12	4.16	4.15	1.66	4.42	4.09	4.36	3.78
	Max. Rainfall, 24-hr storm event (in)	0.56	0.76	1.15	1.09	0.8	1.1	0.43	1.24	1.11	1.15	0.94
Dec-18	Total Monthly Rainfall (in)	3.88	3.64	5.46	5.08	5.05	5.06	3.33	5.36	4.99	5.46	4.73
	Max. Rainfall, 24-hr storm event (in)	1.28	1.64	1.81	1.74	1.7	1.71	1.13	1.8	1.64	1.79	1.62
Jan-19	Total Monthly Rainfall (in)	0.33	2.26	2.72	2.54	2.82	2.52	1.6	2.84	2.49	2.84	2.30
	Max. Rainfall, 24-hr storm event (in)	0.17	1.06	1.03	1.01	1.03	1.02	0.69	1.05	1.11	1.06	0.92
Feb-19	Total Monthly Rainfall (in)	3.11	3.91	4.26	4.01	4.29	4.36	2.96	4.34	3.69	4.14	3.91
	Max. Rainfall, 24-hr storm event (in)	1.27	1.53	1.55	1.48	1.63	1.63	1.4	1.63	1.44	1.51	1.51
Mar-19	Total Monthly Rainfall (in)	1.35	1.7	1.84	1.74	1.91	1.72	0.44	1.8	1.85	1.72	1.61
	Max. Rainfall, 24-hr storm event (in)	0.57	0.82	0.81	0.72	0.76	0.73	0.17	0.76	0.71	0.74	0.68
Apr-19	Total Monthly Rainfall (in)	3.49	4.38	4.19	3.75	4.3	4.02	3.71	4.03	3.96	3.8	3.96
	Max. Rainfall, 24-hr storm event (in)	1.12	1.35	1.31	1.32	1.31	1.19	1.11	1.26	1.37	1.27	1.26
May-19	Total Monthly Rainfall (in)	4.89	2.66	5.85	4.77	5.53	5.05	5.33	5.31	2.67	5.61	4.77
	Max. Rainfall, 24-hr storm event (in)	1.84	1.37	2.26	2.03	2.47	2.32	2.26	2.54	0.98	2.19	2.03
Jun-19	Total Monthly Rainfall (in)			3.82					4.11	0.17		2.70
	Max. Rainfall, 24-hr storm event (in)			2.04					2.26	0.53		1.61
Jul-19	Total Monthly Rainfall (in)			8.32					7.4	3.69		6.47
	Max. Rainfall, 24-hr storm event (in)			2.73					2.54	2.27		2.51
Aug-19	Total Monthly Rainfall (in)			3.33					3.8	3.48		3.54
	Max. Rainfall, 24-hr storm event (in)			0.81					0.86	0.85		0.84
Sep-19	Total Monthly Rainfall (in)			2.87					2.9	3.06		2.94
	Max. Rainfall, 24-hr storm event (in)			1.77					1.63	1.71		1.70

Highest Mean Monthly Inflow Calculation	
Max. Total Rainfall Amount, in	10.19
Max. Total Rainfall Amount, ft	0.85
PHL Drainage Area, ac	200
PHL Drainage Area, sf	8,712,000
Rainfall Depth, cf (using highest monthly total rainfall)	7,398,666
Highest monthly inflow, cfs	2.854
70% of highest monthly inflow, cfs	1.998

FILTER DRAINAGE DIAPHRAGM

Project Name:	Four Mile Run	**By:**	EJB	10/16/2019
Project Number:	174-960	**Checked By:**	JAL	10/17/2019

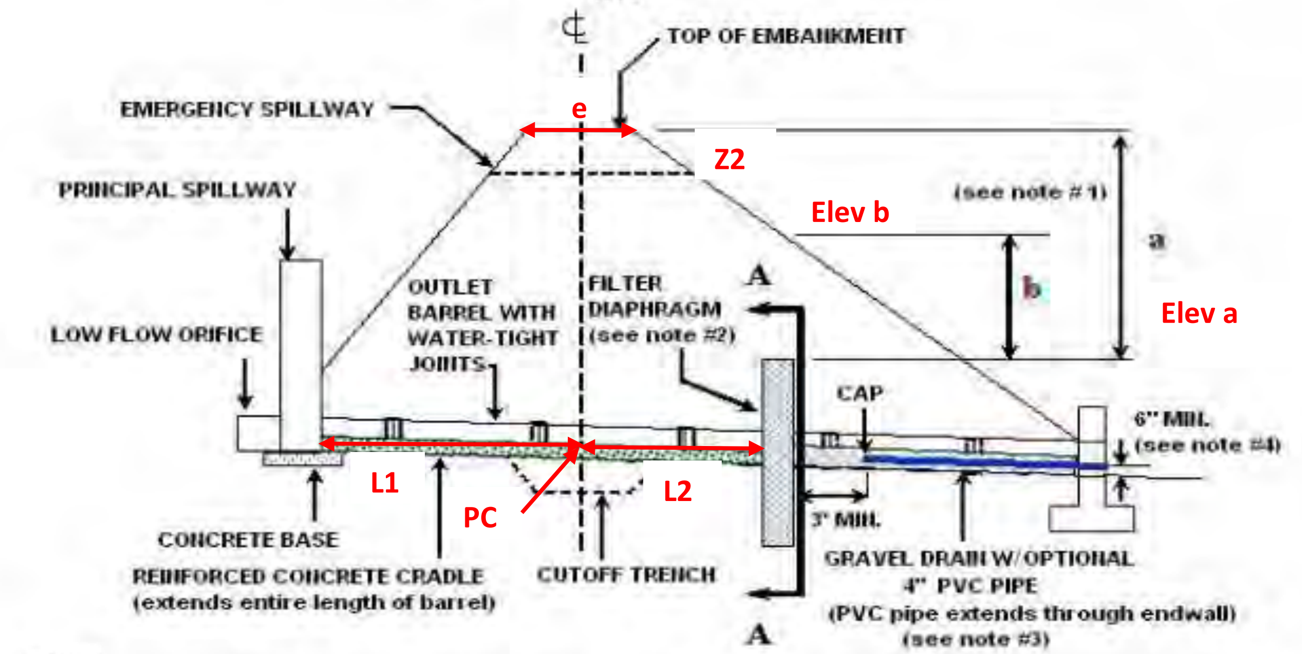
Diameter of Outlet Pipe (D) (in) =	30
Bottom of Pond Elevation (ft) =	796
Top of Embankment Elevation (ft) =	814
Width of Embankment e (ft) =	360.5
Outside Embankment Slope (Z2) =	3
Pipe Invert Elevation (ft)=	800
Pipe Outvert Elevation (ft)=	794.14
Pipe Length (ft) =	420
Horizontal Distance from Pipe invert to Centerline of Berm (L1) (ft) =	211
Slope (%) =	1.40%
W (ft) = 3D	7.5
L (ft) = 1.5D	3.75
a (ft) =	9.66
b (ft) =	4.83
Elevation a (ft) =	804.34
Elevation b (ft) =	809.1666667
Berm Centerline along Pipe (PC) (ft) =	797.06

Horizontal Length from CL (L2) to diaphragm(horizontal) (ft):	194.75
a/b = 2	2.00

a/b must equal 2, test L2 until a/b=2.0

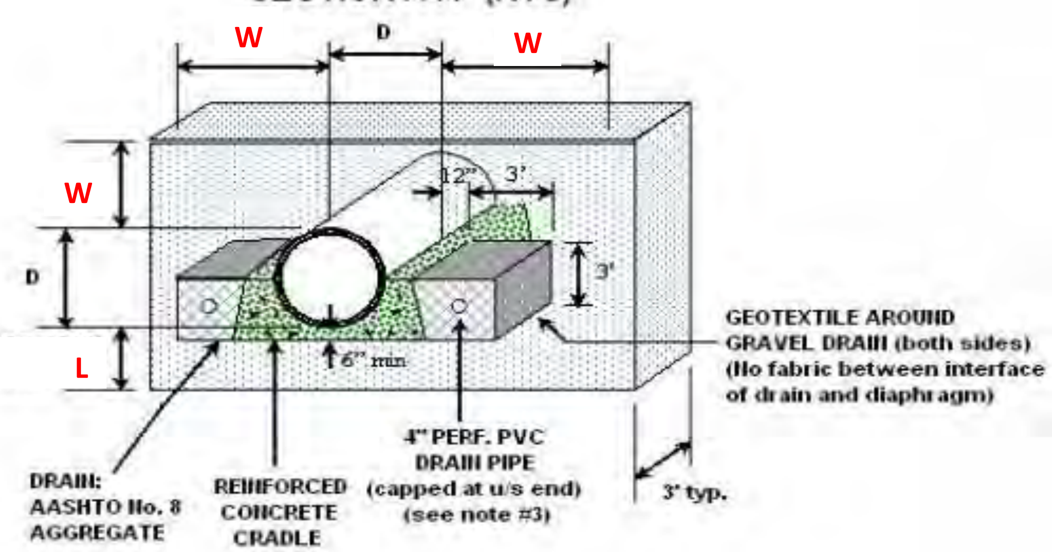
The Diaphragm should be placed	**195**	ft from berm centerline
The Diaphragm should extend to	**7.5**	ft above the top of pipe
and	**3.75**	ft beneath the pipe
In plan view, the diaphragm is	**17.5**	ft in width (perpindicular to flow)
by	**3**	ft in depth (parallel to flow)

FIGURE 7.8
Typical Filter Diaphragm Installation
NTS



Notes:
1. Diaphragm should belocated d/s of embankment centerline and cutoff trench and u/s of a point where b = 0.5 a
2. Diaphragm should be constructed using a specially graded sand (Typically Type A concrete sand)
3. Optional drin pipe should have maximum 3/16" perforations if used in AASHTO No. 8 drain.
4. Outlet of drain should be located at least 6" above invert of outlet conduit.

SECTION A-A (NTS)



PRINCIPAL SPILLWAY PIPE - BUCKLING ANALYSIS

Civil & Environmental Consultants, Inc.

PROJECT Four Mile Run PROJECT NO. 174-960

30" HDPE DR 26 DIPS Pipe PAGE 1 OF 12

Buckling Calculation

PREPARED BY EJB DATE 10-20-19 CHECKED BY CLR DATE 10/21/19

Buckling Analysis for 30" HDPE DR 26 DIPS Pipe.

Purpose: A 30" Dia. HDPE DR 26 DIPS pipe is proposed to be constructed in Panther Hollow Lake for for the principal spillway. The pipe is to be placed under a maximum fill height of 18 (ft). This calculation will determine if the pipe can withstand wall buckling & the hydrostatic pressure.

Reference: Plastic Pipe used in Embankment Dams. Chapter 3 - Structural & Hydraulic Design, Pgs. 10, 58-61, 74-75

Pipe Specification: 30" - HDPE DIPS DR 26 (80 psi) $t_w = 1.231"$ min. ✓

Buckling Analysis: Allowable Buckling Pressure $Av_{ID} = 29.390"$ ✓

Weight = 52.31 lb/ft ✓

Man. JMM

✓ Formula: $q_a = \frac{1}{FS}\left(32\, R_w\, B'\, E'\, \frac{EI_{pw}}{D_o^3}\right)^{1/2}$

$h =$ Top of Berm − Top of Pipe $= 814 - 796.74 = 17.26 \cong 18' = 216"$

$D_o = Avg_{ID} + t_w = 29.390" + = 30.621"$ ✓

$t_w = 1.231"$

$\gamma = 125$ lb/cf ✓

$E' = 2000$ lb/in² [REF: Design of PE Piping Systems, Pg 214]

✓ $E = 28{,}250$ lb/in² [REF: Method for Prediction of flex Pipe deflection, pg 10]

$\frac{h}{D_o} = \frac{216}{30.621} = 7.05 \geq 2 \quad FS = 2.5$ ✓

Civil & Environmental Consultants, Inc.

PROJECT Four Mile Run PROJECT NO. 174-960

30" HDPE DR 26 DIPS Pipe PAGE 2 OF 12

Buckling Calculation

PREPARED BY EJB DATE 10-20-19 CHECKED BY ______ DATE ______

$R_w = 1 - 0.33(h_w/h)$ ✓

$h_w = 0$ Ft. ✓

$R_w = 1 - 0.33(0/216) = 1 - 0 = 1$ ✓

$\underline{R_w = 1}$ ✓

$$B' = \frac{4(h^2 + D_o h)}{1.5(2h + D_o)^2} = \frac{4(216)^2 + 30.621(216)}{1.5(2 \times 216 + 30.621)^2} = 0.60 \checkmark$$

$\underline{B' = 0.60}$

$$I_{P_W} = \frac{t_w^3}{12} = \frac{(1.231)^3}{12} = 0.155 \text{ in}^4/\text{in.} \checkmark$$

$$q_a = \frac{1}{2.5}\left(32 \times 1.0 \times 0.60 \times 2000 \left(\frac{28{,}250}{(30.621)^3} \times 0.155\right)\right)^{1/2}$$

$$q_a = \frac{1}{2.5}(76.53) = 30.61 \text{ lb/in}^2 \checkmark$$

Actual Load Over Pipe

$$\left(18' \times 125 \frac{\text{lb}}{\text{ft}^3}\right) + \left(0' \times 62.5 \frac{\text{lb}}{\text{ft}^3}\right) = 2{,}250 \frac{\text{lb}}{\text{ft}^2} \times \frac{1 \text{ ft}^2}{144 \text{ in}^2} = 15.625 \text{ psi}$$

$$\text{Actual FS} = \frac{76.53}{15.625} = 4.89$$

PROJECT Four Mile Run

30'' HDPE DR26 DIPS Pipe

Buckling Calculation

PREPARED BY EJB DATE 10-2019 CHECKED BY ________ DATE ________

Civil & Environmental Consultants,

PROJECT NO. 174-960

Critical Buckling

$$P_{cr} = \frac{2E}{1-\nu^2}\left(\frac{1}{SDR-1}\right)^3, \text{ For Solid Wall Pipe.}$$

$\nu = 0.45$ for HDPE

$$SDR = \frac{D_o}{t_w} = \frac{30.621}{1.231} = 24.87$$

$$P_{cr} = \frac{2(28,250)}{1-0.45^2}\left(\frac{1}{24.87-1}\right)^3$$

$$P_{cr} = \underline{5.2\ psi}$$

Conclusion: A 30'' HDPE SDR 26 DIPS Pipe under 15,625 psi will be appropriate.

Note: Above calculation Assumes no deflection. Max Deflection of PE Pipe can be 5%.

Typical failure modes of flexible pipes are shown in figure 43. Flexible pipe design of buried plastic pipe includes analyses of the wall crushing, buckling resistance, allowable long-term deflection, and allowable strain. Deflection and buckling most often control the design of flexible pipe. Table 9 in section 3.5.6 provides the appropriate method of determining the soil load based on soil type and type of conduit.

3.1.1 Wall crushing

Wall crushing in plastic pipe is characterized by localized yielding when the in-wall stress reaches the yield stress of the pipe material (Moser, 2001, p. 499). Wall crushing typically occurs at the 3 and 9 o'clock positions as illustrated in figure 43a. Figure 44 shows an example of wall crushing. This localized yielding can occur in improperly designed stiff flexible pipes installed in deep, highly compacted fill. Less stiff flexible pipe more frequently fails from wall buckling, as discussed in section 3.1.2.

Resistance to wall crushing of plastic pipe is evaluated by:

$$T_{pw} = \frac{PD_0}{2} \tag{3-1}$$

where:

T_{pw} = thrust in pipe wall, lb/in
D_0 = outside diameter of the pipe, in
P = design pressure ($P_S+P_V+P_W$), lb/in^2 (see equations 2-6, 2-15, and 2-17)

The required wall cross-sectional area is determined by:

$$A_{pw} = \frac{T_{pw}}{\sigma} \tag{3-2}$$

where:

A_{pw} = area of the pipe wall, in^2/in of pipe length
T_{pw} = thrust in pipe wall, lb/in
σ = allowable long-term compressive stress, lb/in^2
= $HDB/2$
HDB = hydrostatic design basis of the pipe, lb/in^2

The actual area for a solid wall pipe wall may be computed as:

$$A_{pw} = \frac{(D_0 - D_i)}{2} \text{ or } t \tag{3-3}$$

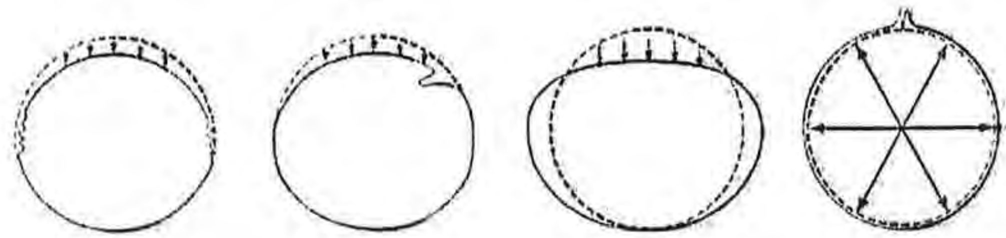


Figure 43.—Typical failure modes for flexible pipes.

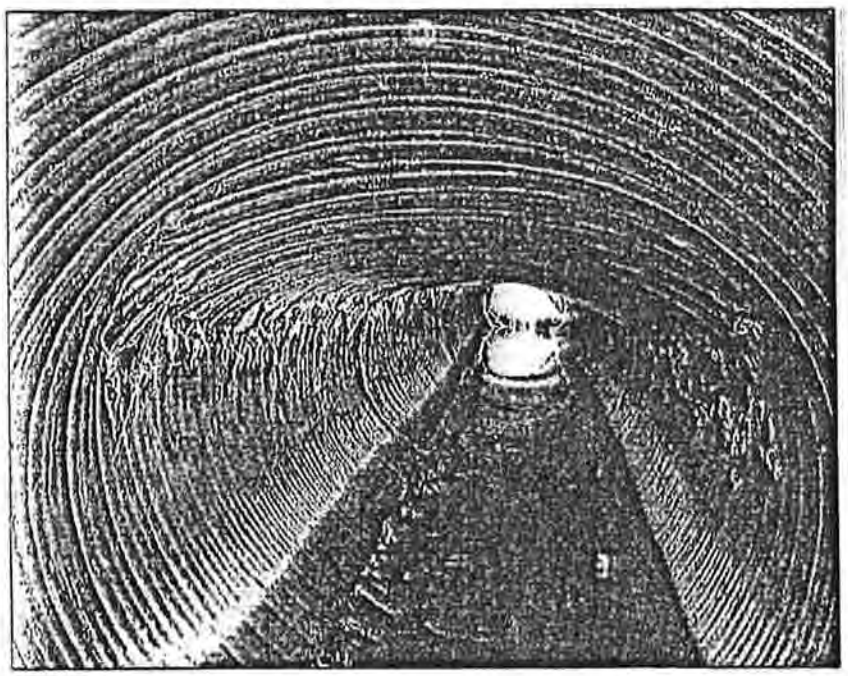


Figure 44.—Single wall corrugated HDPE pipe experiencing wall crushing.

where:

A_{pw} = area of the pipe wall, in^2/in of pipe length
D_O = outside diameter of the pipe, in
D_i = inside diameter of the pipe, in
t = wall thickness of the pipe, in

The actual area of the pipe wall for corrugated (single and profile wall) may be obtained from the manufacturer or ASTM standard.

3.1.2 Wall buckling

External loadings from soil pressures, external hydrostatic pressure, or internal vacuum can cause in inward deformation known as wall buckling (collapse). Wall buckling is characterized by localized yielding, as illustrated in figure 43b. Figure 45 shows an example of single wall corrugated HDPE drainpipe which has failed due to buckling. Wall buckling can occur due to insufficient pipe stiffness. The more flexible the plastic pipe, the more unstable the wall structure will be in resisting wall buckling (Moser, 2001, p. 110). Plastic pipe encased in soil may buckle due to excessive loads and deformations. The total load must be less than the allowable buckling pressure. If good backfill is used with sufficient stiffness, wall buckling is often not a concern and deflection will normally govern the design. This is true in most cases, with the exception for dam applications with shallow cover and internal vacuum pressures or fine grained backfill around embankment conduits used in low hazard potential dams.

The allowable buckling pressure may be computed with various equations (Moser, 2001; Chevron Phillips, 2002, p. 105; AWWA, 2006, p. 61-63; or Uni-Bell, 2001, p. 252). Equation 3-4 is from Moser (2001, p. 112).

$$q_a = \frac{1}{FS}\left(32R_w B' E' \frac{EI_{pw}}{D_O^3}\right)^{1/2} \tag{3-4}$$

where:

q_a = allowable buckling pressure, lb/in^2

FS = factor of safety

= 2.5 for $(h/D_O) \geq 2$

= 3.0 for $(h/D_O) < 2$

where h = height of fill above the top of pipe, in

D_O = outside diameter of the pipe, in

R_w = water buoyancy factor

$$= 1 - 0.33(h_w/h),\ 0 < h_w < h \tag{3-5}$$

where h_w = height of water above top of the pipe, in

B' = empirical coefficient of elastic support

$$= \frac{4(h^2 + D_O h)}{1.5(2h + D_O)^2} \tag{3-6}$$

E' = modulus of soil reaction, lb/in^2

E = modulus of elasticity[1] of pipe material, lb/in^2

[1] A long-term modulus of elasticity is recommended if the pipe is subject to external soil or internal vacuum pressure in normal operations. If the pipe is subject to the pressure for short time periods and infrequently, use of the short-term modulus of elasticity is recommended.

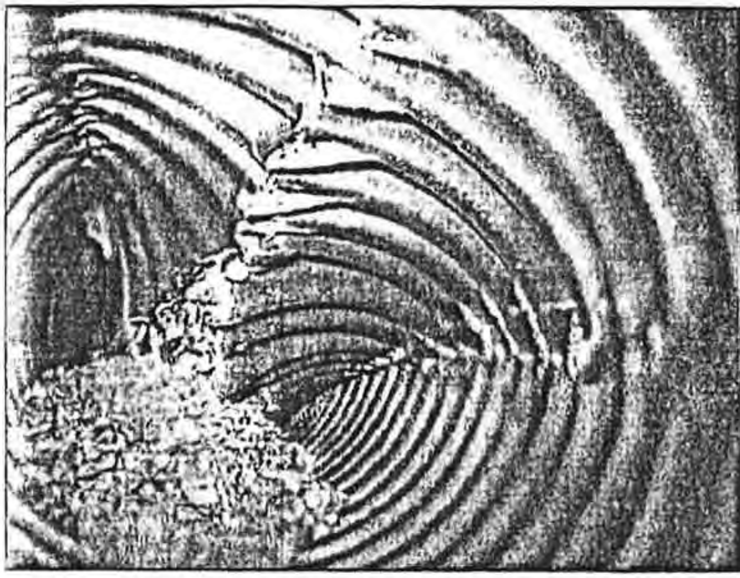


Figure 45.—Single wall corrugated HDPE drainpipe experiencing failure due to buckling.

I_{pw} = pipe wall moment of inertia, in^4/in of pipe length

$$= \frac{t^3}{12} \text{ (for solid wall pipe)} \qquad (3\text{-}7)$$

where t = wall thickness of the pipe, in

(Note: To determine I_{pw} for corrugated single and profile wall pipe, contact the pipe manufacturer)

The allowable buckling pressure depends on the surrounding soil pressure. The allowable buckling pressure increases/decreases as the effective soil pressure surrounding the pipe increases/decreases. The effective soil pressure decreases as the height of water above the pipe increases. The water buoyancy factor, R_w, accounts for the reduction in effective soil pressure for water levels in the soil above the top of the pipe.

For a siphon extending over the crest of a dam that does not have the support of surrounding soil or controlled low strength material, the pipe should be designed to withstand unconstrained wall buckling as described in section 3.3.2 and illustrated in Example A-3 in appendix A.

If plastic pipe is encased in a rigid material, such as grout, the potential for the pipe to buckle as a result of external hydrostatic pressure needs to be considered in accordance with the guidance provided in section 3.3.2.

or precast concrete conduits, see chapter 4 in FEMA's *Technical Manual: Conduits through Embankment Dams* (2005).

3.3 Encased Plastic Pipe

Encased plastic pipe design applies to plastic pipe encased in concrete, flowable fill, grout in the annular space of a slipliner, and plastic pipe on a concrete cradle. The encasement provides uniform circumferential support to the pipe. Plastic pipe in this configuration should be designed as an encased pipe, rather than a flexible pipe, and cross-sectional deflection should be considered negligible. If the groundwater table is above the encasement, the potential exists to develop hydrostatic pressure between the encasement and the pipe through cracks, joints, imperfections in the encasement. Complete grouting of the annulus around a slipliner pipe is difficult and inspection is impractical. With these concerns, the structural design of encased plastic pipe should consider the wall crushing due to the soil load, internal hydrostatic pressure and wall buckling caused by external hydrostatic pressure. Example A-2 in appendix A demonstrates the principles used in encased plastic pipe design.

3.3.1 Wall crushing

Encased plastic pipe is analyzed for wall crushing due to the soil load using the equations for wall crushing described in section 3.1.1. Any support from the encasement or an existing pipe is ignored. If an encased conduit extends through an embankment dam, soil loads should be calculated for an embankment conduit in the positive projecting condition as discussed in section 2.1.2.

3.3.2 Wall buckling

The potential exists to develop an opening within the grouted annulus of a slipliner or between the concrete encasement and the plastic pipe. Therefore, plastic pipe should be designed to withstand external hydrostatic pressure on the pipe due to loadings from the reservoir or internal vacuum pressure. The pipe should be conservatively designed to withstand unconstrained buckling pressure by:

$$P_{CR} = \frac{3EI_{pw}}{\left(1-\nu^2\right)r^3} \text{ for all pipe} \qquad (3\text{-}18)$$

$$P_{CR} = \frac{0.447PS}{(1-\nu^2)} \text{ for short-term loading}^1 \text{ of corrugated plastic pipe} \qquad (3\text{-}19)$$

$$P_{CR} = \frac{2E}{(1-\nu^2)}\left(\frac{1}{SDR-1}\right)^3 \text{ for solid-wall pipe} \qquad (3\text{-}20)$$

where:

P_{CR} = unconstrained collapse pressure, lb/in^2

E = modulus of elasticity of the pipe material,* lb/in^2 (see section 3.1)

I_{pw} = pipe wall moment of inertia, in^4/in of pipe length

ν =Poisson's ratio (0.38 for PVC, 0.35 for short-term loading of HDPE, and 0.45 for long-term loading of HDPE)

r = mean pipe radius, in

PS = pipe stiffness, lb/in^2 (as determined in accordance with ASTM F 894 and D 2412)

$SDR = D_O/t$

where D_O = outside diameter of the pipe, in

t = wall thickness of the pipe, in

* A long-term modulus of elasticity and Poisson's ratio are recommended if the pipe is subject to the pressure in the normal operations. If the pipe is subject to the pressure for short time periods and infrequently, the short-term modulus of elasticity is recommended. The hydrostatic pressure from the maximum reservoir pool would be considered long term.

Research conducted by Ian Moore (El-Sawy and Moore, 1997) has shown that for plastic pipes fully encased in concrete, the unconstrained collapse pressure can be increased by an enhancement factor of 4 to 5 depending upon the pipe SDR and ovality. This assumes that the grouting process completely encases the pipe. However, for plastic pipe used in sliplining applications, a more conservative design is required for withstanding unconstrained buckling pressure, since complete grouting of the annulus (see section 3.5.4) can not be reasonably assured.

Pipes that are significantly out-of-round or deflected have less collapse (buckling) resistance than round pipes. Pipes that are out-of-round due to manufacturing or deflected due to external pressure from soil and wheel loads or internal vacuum pressure have a lower allowable buckling pressure due to an increase in the bending moment. The allowable buckling pressure for these out-of-round or deflected pipes should be reduced by the following factor:

[1] Equation 3-19 is to be used only for wall buckling due to short-term loads since the pipe stiffness (PS) is representative of short-term material properties.

10/12

TABLE 3-7
Values of E' for Pipe Embedment (See Howard [8])

Soil Type-pipe Embedment Material (Unified Classification System)[1]	E' for Degree of Embedment Compaction, lb/in²			
	Dumped	Slight, <85% Proctor, <40% Relative Density	Moderate, 85%-95% Proctor, 40%-70% Relative Density	High, >95% Proctor, >70% Relative Density
Fine-grained Soils (LL > 50)[2] Soils with medium to high plasticity; CH, MH, CH-MH	No data available: consult a competent soils engineer, otherwise, use E' = 0.			
Fine-grained Soils (LL < 50) Soils with medium to no plasticity, CL, ML, ML-CL, with less than 25% coarse grained particles.	50	200	400	1000
Fine-grained Soils (LL < 50) Soils with medium to no plasticity, CL, ML, ML-CL, with more than 25% coarse grained particles; Coarse-grained Soils with Fines, GM, GC, SM, SC[3] containing more than 12% fines.	100	400	1000	2000
Coarse-grained soils with Little or No Fines GW, GP, SW, SP[3] containing less than 12% fines	200	1000	2000	3000
Crushed Rock	1000	3000	3000	3000
Accuracy in Terms of Percentage Deflection[4]	±2%	±2%	±1%	±0.5%

REF

[1] ASTM D-2487, USBR Designation E-3
[2] LL = Liquid Limit
[3] Or any borderline soil beginning with one of these symbols (i.e., GM-GC, GC-SC).
[4] For ±1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%.

Note: Values applicable only for fills less than 50 ft (15 m). Table does not include any safety factor. For use in predicting initial deflections only; appropriate Deflection Lag Factor must be applied for long-term deflections. If embedment falls on the borderline between two compaction categories, select lower E' value, or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using 12,500 ft-lb/cu ft (598,000 J/m²) (ASTM D-698, AASHTO T-99, USBR Designation E-11). 1 psi = 6.9 KPa.

sufficient accuracy for the Reclamation Equation. Table 4 shows typical values for E. The values for PVC and HDPE are for solid wall pipe only.

Table 4. Typical Modulus of Elasticity Values (E)

Pipe type	E (lb/in^2)
HDPE	28,250 [1]
PVC	400,000 [2]
Steel	29,000,000 [3]
DI	24,000,000
Bar-wrapped concrete cylinder	4,000,000 [4]
Fiberglass	Varies [5]

~~REF~~ HDPE

REF PVC

[1] PE3408 and PE4710 Material at 73°degrees Fahrenheit (° F) (long-term E).
[2] Class 12454 Material.
[3] ASTM A1011 or A1018, Grade 36.
[4] Cement mortar lining and coating. Use transformed section for steel cylinder and bars.
[5] Pipe stiffness may be determined by the parallel plate test or be provided by manufacturer.

The pipe stiffness factor is the product of the modulus of elasticity, E, of the pipe wall material (lb/in^2) and the moment of inertia, I, ($inch^4/inch$) of a unit length of pipe divided by the mean pipe radius, r, (inches) cubed. For a unit length of straight wall pipe of homogeneous material, the moment of inertia is equal to $t^3/12$ where t is the wall thickness. The EI value may be found using assumed or empirical values for E and t; or EI can be determined by conducting parallel plate tests on a section of pipe as defined in American Society for Testing Materials (ASTM) D2412. During the test, deflections due to line loads on the top and bottom of the pipe are measured, and EI is calculated using either:

$$EI = 0.149 \frac{Pr^3}{\Delta Y} \quad \text{(Equation 3.2)}$$

$$EI = 0.136 \frac{Pr^3}{\Delta X} \quad \text{(Equation 3.3)}$$

Where:

P = load per linear inches
r = pipe radius, inches
ΔY = vertical deflection, inches
ΔX = horizontal deflection, inches

In the parallel plate tests, the pipe deforms elliptically with the horizontal deflection (theoretically about 91 percent of the vertical deflection).

HDPE DUCTILE IRON PIPE SIZE (DIPS) PRESSURE PIPE PE4710

		DR 7 (333 psi)			DR 9 (250 psi)			DR 11 (200 psi)			DR 13.5 (160 psi)			DR 17 (125 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
4	4.800	0.686	3.346	3.87	0.533	3.670	3.13	0.436	3.876	2.62	0.356	4.045	2.18	0.282	4.202	1.76
6	6.900	0.946	4.894	7.99	0.767	5.274	6.46	0.627	5.571	5.41	0.511	5.817	4.50	0.406	6.039	3.64
8	9.050	1.293	6.309	13.75	1.006	6.917	11.12	0.823	7.305	9.32	0.670	7.630	7.74	0.532	7.922	6.25
10	11.100	1.586	7.738	20.68	1.233	8.486	16.72	1.009	8.961	14.01	0.822	9.357	11.64	0.653	9.716	9.41
12	13.200	1.886	9.202	29.24	1.467	10.090	23.65	1.200	10.656	19.82	0.978	11.127	16.47	0.776	11.555	13.30
14	15.300	2.186	10.666	39.29	1.700	11.696	31.77	1.391	12.351	26.63	1.133	12.898	22.12	0.900	13.392	17.88
16	17.400	2.486	12.130	50.81	1.933	13.302	41.09	1.582	14.046	34.44	1.289	14.667	28.61	1.024	15.229	23.13
18	19.500	2.786	13.594	63.82	2.167	14.906	51.61	1.773	15.741	43.25	1.444	16.439	35.92	1.147	17.068	29.04
20	21.600				2.400	16.512	63.32	1.964	17.436	53.07	1.600	18.208	44.09	1.271	18.905	35.64
24	25.800				2.867	19.722	90.34	2.345	20.829	75.69	1.911	21.749	62.90	1.518	22.582	50.84
30	32.000							2.909	25.833	116.46	2.370	26.976	96.76	1.880	28.014	78.18
36	38.300										2.837	32.286	138.62	2.253	33.524	112.02
42	44.500													2.618	38.950	151.24
48	50.800													2.988	44.465	197.05

		DR 19 (111 psi)			DR 21 (100 psi)			DR 26 (80 psi)			DR 32.5 (64 psi)		
Pipe Size	Avg OD	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft	Min Wall	Avg ID	Weight lb/ft
4	4.800	0.253	4.264	1.59	0.229	4.315	1.44	0.185	4.408	1.18	0.148	4.486	0.95
6	6.900	0.363	6.130	3.28	0.329	6.203	2.98	0.265	6.338	2.43	0.212	6.451	1.96
8	9.050	0.476	8.041	5.64	0.431	8.136	5.13	0.348	8.312	4.18	0.278	8.461	3.37
10	11.100	0.584	9.862	8.48	0.529	9.979	7.72	0.427	10.195	6.29	0.342	10.375	5.08
12	13.200	0.695	11.727	11.99	0.629	11.867	10.91	0.508	12.123	8.91	0.406	12.339	7.18
14	15.300	0.805	13.593	16.11	0.729	13.755	14.66	0.588	14.053	11.95	0.471	14.301	9.65
16	17.400	0.916	15.458	20.83	0.829	15.643	18.96	0.669	15.982	15.46	0.536	16.264	12.49
18	19.500	1.026	17.325	26.16	0.929	17.531	23.81	0.750	17.910	19.42	0.600	18.228	15.67
20	21.600	1.137	19.190	32.10	1.029	19.419	29.22	0.831	19.838	23.84	0.665	20.190	19.24
24	25.800	1.358	22.921	45.80	1.229	23.195	41.68	0.992	23.697	33.99	0.794	24.117	27.44
30	32.000	1.684	28.430	70.45	1.524	28.769	64.11	1.231	29.390	52.31	0.985	29.912	42.22
36	38.300	2.016	34.026	100.93	1.824	34.433	91.84	1.473	35.177	74.92	1.179	35.801	60.43
42	44.500	2.342	39.535	136.25	2.119	40.008	123.96	1.712	40.871	101.17	1.370	41.596	81.59
48	50.800	2.674	45.131	177.55	2.419	45.672	161.55	1.954	46.658	131.83	1.563	47.486	106.34

EMERGENCY SPILLWAY STRUCTURAL DESIGN CALCULATION

QA REVIEW DOCUMENTATION

CREATED BY: AMH DATE: 10/21/19 CHECKED BY: RTJ DATE: 10/21/19

Purpose

The purpose of this calculation is to evaluate the design of a reinforced concrete slab for a spillway.

Assumptions

The following assumptions have been made to develop this calculation:

1) Allowable bearing capacity for the underlying soils is 2,000 psf
2) Modulus of subgrade reaction for the underlying soils is 50 pci
3) Concrete will have a minimum compressive strength of 4,000 psi
4) Reinforcing steel with have a yield strength of 60,000 psi
5) Water flow over the slab will not exceed 12" deep
6) Additional live load of 100 psf will be applied to account for potential maintenance traffic on slab

References

1) ACI 350-06, "Code Requirements for Environmental Engineering Concrete Structures.
2) ACI 318-14, "Building Code Requirements for Structural Concrete
3) "Slab Thickness Design for Industrial Concrete Floors on Grade," Portland Cement Association

1.0 Slab Design

Design Values:

Assumed modulus of subgrade reaction $k := 50\ pci$

Assumed concrete compressive strength $f'_c := 4000\ psi$

Modulus of elasticity for concrete $E_c := 57000 \cdot (f'_c \cdot psi)^{0.5} = (3.605 \cdot 10^6)\ psi$

[Ref. 2: 8.5.1]

Assumed slab thickness $h := 12\ in$

Allowable extreme fiber stress in tension $f_r := 7.5 \cdot (f'_c \cdot psi)^{0.5} = 474.342\ psi$

Slab Design for Uniform Load:

Load on slab (100 psf for live load + 65 psf for water load) $LL := 165\ psf$

Allowable stationary live load (for pressure only, FS=2)

$$W := 0.123 \cdot f_r \cdot \sqrt{h \cdot k \cdot \frac{1}{psi}} \cdot \frac{psf}{psi} = 1429.131\ psf$$

[Ref. 3: p. 13]

$$SLL_{Allow} := \frac{W}{2} = 715\ psf \quad \geq \quad LL = 165\ psf$$

Reinforcement Requirement:

Ref. 1; Table 7.12.2.1 - Minimum Shrinkage and Temperature Reinforcement;

For 20' - 30' between movement joints (assuming no joints in 12' x 25' section) and Grade 60 reinforcing steel:

Minimum shrinkage and temp reinforcement ratio $r := 0.0030$

For 12" wide cross section $A_s := h \cdot 12 \cdot in \cdot r = 0.432\ in^2$

One layer of #6 rebar @ 12" OC provides As = 0.44 in^2

Using RAM Elements, the slab was modeled as a 12" thick concrete shell with 3" min. clear cover. The slab was divided into 12" x 12" sections and each node (for interior shells) was modeled as a spring using a translational stiffness (in vertical direction) of 1 k/in (this would be much less than the 50 pci modulus of subgrade reaction for the shell sizes selected).

Pinned connections were modeled at the for corners of the overall slab - only to provide stability within the model.

The shells were loaded with self-weight for dead load, 100 psf live load, and 65 psf for water (modeled as live load).

The worst case design load combination was 1.2 DL + 1.6LL. For that combination, the maximum requirement for flexural reinforcement in the bottom of the slab was 0.4 in^2. For the top of slab, the reinforcement requirement was negligible.

Maximum stress in the slab was 660 psi.

APPENDIX F

DRAWING LIST, SPECIFICATIONS, QUANTITIES AND SCHEDULE (SECTION 8)

DRAWING LIST

SHEET NO.	DESCRIPTION
G100	COVER SHEET
G101	GENERAL NOTES/LEGEND/ABBREVIATIONS
C100	EXISTING CONDITIONS PLAN
C200	SITE PREPARATION PLAN
C300	PROPOSED SITE GRADING PLAN
C301	LAKE EMBANKMENT PROFILE AND SECTION VIEWS - SHEET 1 OF 2
C302	LAKE EMBANKMENT PROFILE AND SECTION VIEWS - SHEET 2 OF 2
C400	PANTHER HOLLOW LAKE PRINCIPLE AND EMERGENCY SPILLWAY PLAN & PROFILE VIEW
C800	CONSTRUCTION DETAILS - SHEET 1 OF 4
C801	CONSTRUCTION DETAILS - SHEET 2 OF 4
C802	CONSTRUCTION DETAILS - SHEET 3 OF 3
C803	CONSTRUCTION DETAILS - SHEET 4 OF 4
C900	EROSION AND SEDIMENT CONTROL PLAN
C901	EROSION AND SEDIMENT CONTROL PLAN
C902	EROSION AND SEDIMENT CONTROL PLAN
C903	EROSION AND SEDIMENT CONTROL PLAN

CONSTRUCTION DRAWINGS

PANTHER HOLLOW LAKE REHABILITATION PROJECT

CITY OF PITTSBURGH, ALLEGHENY COUNTY, PENNSYLVANIA

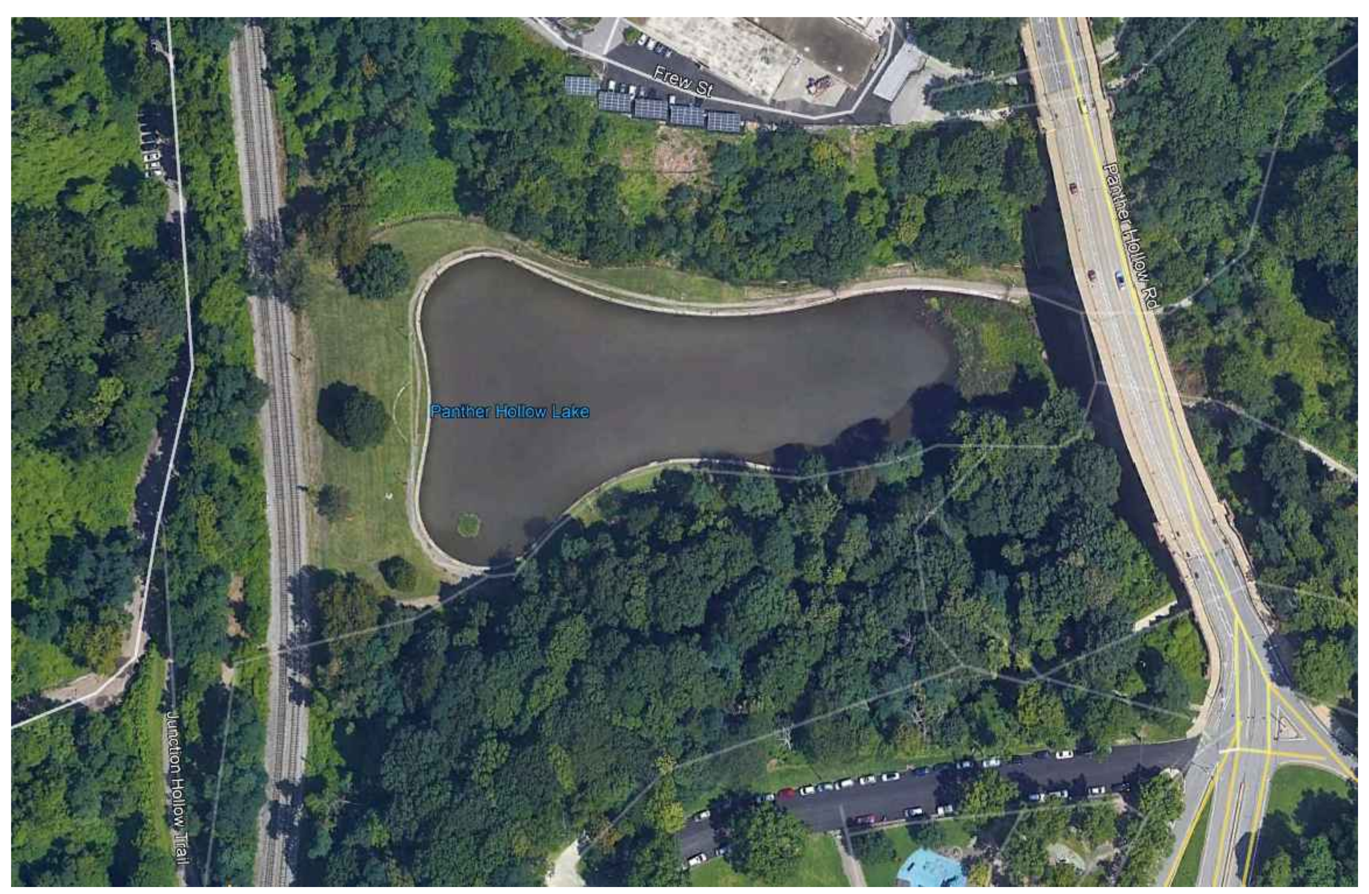
PREPARED FOR:
CITY OF PITTSBURGH, DEPARTMENT OF PUBLIC WORKS-PARKS MAINTENANCE DIVISION

AND

PITTSBURGH WATER & SEWER AUTHORITY
1200 PENN AVENUE
PITTSBURGH, PA 15222

OCTOBER 2019

NORTH



SITE AERIAL PHOTO

REFERENCE

1. AERIAL HAS BEEN GENERATED REFERENCING GOOGLE EARTH
2. APPROXIMATE SCALE 1"=500'

NORTH

VICINITY AERIAL PHOTO

REFERENCE

1. VICINITY MAP HAS BEEN GENERATED REFERENCING GOOGLE EARTH
2. APPROXIMATE SCALE 1"=2.5 MILE

DRAWING LIST

SHEET NO.	DESCRIPTION
G100	COVER SHEET
G101	GENERAL NOTES/LEGEND/ABBREVIATIONS
C100	EXISTING CONDITIONS PLAN
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C801	CONSTRUCTION DETAILS - SHEET 2 OF 4
C802	CONSTRUCTION DETAILS - SHEET 3 OF 3
C803	CONSTRUCTION DETAILS - SHEET 4 OF 4
C900	EROSION AND SEDIMENT CONTROL PLAN
C901	EROSION AND SEDIMENT CONTROL PLAN
C902	EROSION AND SEDIMENT CONTROL PLAN
C903	EROSION AND SEDIMENT CONTROL PLAN

PREPARED BY:
CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
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PITTSBURGH, PA 15205
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REVISION RECORD

NO	DATE	DESCRIPTION

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PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	CLR	CHECKED BY:	JAL	APPROVED BY:	PJS
DATE:	OCTOBER 2019	DWG SCALE:		PROJECT NO:	174-960

COVER SHEET
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: G100

GENERAL NOTES

1. BEFORE ANY EARTHWORK ACTIVITIES ARE ALLOWED TO BEGIN ONSITE, THE CONTRACTOR SHALL CONTACT THE PENNSYLVANIA ONE CALL SYSTEM AT 1–800–962–7962 OR 811 A MINIMUM OF 3 DAYS PRIOR TO EARTHWORK ACTIVITIES TO ALLOW THE UTILITY COMPANIES TO MARK THE LOCATIONS OF EXISTING LINES OWNED AND MAINTAINED BY THE UTILITY COMPANIES.

2. THE FOLLOWING PERMIT APPLICATIONS HAVE BEEN SUBMITTED FOR WORK TO BE PERFORMED UNDER THIS CONTRACT. THE OWNER HAS RECEIVED PERMISSION FROM THE APPROPRIATE AGENCY TO PROCEED WITH WORK IN ADVANCE OF PERMIT APPROVAL. THE CONTRACTOR SHALL FOLLOW ALL STIPULATIONS OF THE PERMIT APPLICATIONS.

   A. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FROM PADEP FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

   B. STORMWATER POLLUTION PROTECTION PLAN (SWPPP).

   C. EROSION AND SEDIMENT CONTROL PLAN.

   D. PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (PADEP) DAM PERMIT.

3. EXISTING TOPOGRAPHY AND DIMENSIONS WERE OBTAINED FROM A COMPILATION OF TOPOGRAPHIC GROUND SURVEY AND GIS DATA INFORMATION. TOPOGRAPHIC ELEVATIONS AND DIMENSIONS SHOULD BE VERIFIED IN THE FIELD AND INVERTS SHOULD BE CHECKED IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE OWNER AND THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

4. EXACT PLAN LOCATION, SURFACE ELEVATION, AND INVERT ELEVATION LOCATION OF ALL EXISTING UTILITIES SHOULD BE VERIFIED.

5. A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT, GRAVEL AREAS OR TOPOGRAPHY, AND NEW PAVEMENT, GRAVEL AREAS OR TOPOGRAPHY SHOULD BE PROVIDED. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY.

6. ONE SET OF AS–BUILT / RECORD DRAWINGS SHOULD BE MAINTAINED ON THE JOB SITE DURING CONSTRUCTION FOR DISTRIBUTION TO THE OWNER AND/OR OWNER'S REPRESENTATIVE UPON COMPLETION.

7. EARTHWORK SHALL INCLUDE CLEARING AND GRUBBING, STRIPPING AND STOCKPILING TOPSOIL, GRADING, EXCAVATION, FILLING, UNDERCUT AND REPLACEMENT, AND COMPACTION.

8. ALL AREAS NOT PAVED OR GRAVELED SHALL BE STABILIZED IN ACCORDANCE WITH THE SPECIFICATIONS, UNLESS NOTED OTHERWISE.

9. DISTANCES SHOWN ON PIPING ARE HORIZONTAL DISTANCES FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE, UNLESS OTHERWISE NOTED.

10. ALL STORMWATER MANAGEMENT FACILITIES, INCLUDING COLLECTION AND CONVEYANCE STRUCTURES, SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE STATE CODES AND REGULATIONS.

11. REFER TO AND FOLLOW THE RECOMMENDATIONS OF THE "GEOTECHNICAL ENGINEERING REPORT" PREPARED FOR THIS PROJECT BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION, TESTING AND FINAL ACCEPTANCE OF ALL NEW STORMWATER FACILITIES CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE REGULATING AGENCIES CONCERNING INSTALLATION, INSPECTION AND APPROVAL OF THE STORMWATER CONSTRUCTION.

LAYOUT GENERAL NOTES

1. CARE SHALL BE TAKEN TO PROTECT UTILITIES THAT ARE TO REMAIN. RELOCATE EXISTING UTILITIES AS INDICATED, OR AS NECESSARY FOR CONSTRUCTION. INSTALL ALL UTILITIES, INCLUDING CONDUITS, PRIOR TO INSTALLATION OF PAVED SURFACES.

2. PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT. FIELD ADJUSTMENT OF FINAL GRADES MAY BE NECESSARY.

3. ALL DAMAGE TO EXISTING PAVEMENT TO REMAIN WHICH RESULTS FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED WITH LIKE MATERIALS AT THE CONTRACTOR'S EXPENSE.

4. CONTRACTOR SHALL ADJUST THE PROPOSED ELEVATION AT THE TOP OF EXCAVATION SLOPES AS NEEDED TO TIE INTO EXISTING GROUND.

5. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD.

DEMOLITION GENERAL NOTES

1. ALL UTILITY DISCONNECTION, REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED WITH THE APPROPRIATE UTILITY COMPANY/AGENCY. UTILITY CONTACTS ARE LISTED BELOW.

2. CONTRACTOR SHALL PROTECT ALL CORNER PINS, MONUMENTS, PROPERTY CORNERS AND BENCHMARKS DURING DEMOLITION ACTIVITIES. IF DISTURBED, CONTRACTOR SHALL HAVE DISTURBED ITEMS RESET BY A LICENSED SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.

3. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND FEATURES TO REMAIN. ANY ITEMS TO REMAIN THAT HAVE BEEN DISTURBED OR DAMAGED AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.

4. CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND AS REQUIRED BY LOCAL AGENCIES WHEN WORKING IN AND/OR ALONG STREETS, ROADS, HIGHWAYS, ETC. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL AND COORDINATE WITH LOCAL AND/OR STATE AGENCIES REGARDING THE NEED, EXTENT AND LIMITATIONS ASSOCIATED WITH INSTALLING AND MAINTAINING TRAFFIC CONTROL MEASURES.

5. PROVIDE NEAT, STRAIGHT, FULL DEPTH, SAW CUTS OF EXISTING PAVEMENT WHERE INDICATED ALONG LIMITS OF PAVEMENT DEMOLITION.

6. ALL UTILITY AND STRUCTURE REMOVAL, RELOCATION, CUTTING, CAPPING AND/OR ABANDONMENT SHALL BE COORDINATED AND PROPERLY DOCUMENTED BY A CERTIFIED PROFESSIONAL, WHEN APPLICABLE, WITH THE APPROPRIATE UTILITY COMPANY, MUNICIPALITY AND/OR AGENCY.

7. NO TREES SHALL BE REMOVED, NOR VEGETATION DISTURBED BEYOND THE LIMITS OF CONSTRUCTION WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.

8. THE CONTRACTOR SHALL USE SUITABLE METHODS TO CONTROL DUST AND DIRT CAUSED BY THE DEMOLITION ACTIVITY.

UTILITY GENERAL NOTES

1. ALL PROPOSED UTILITY LINES AND EXTENSIONS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH ALL APPLICABLE UTILITY COMPANY SPECIFICATIONS. CONTRACTOR SHALL COORDINATE UTILITY DISCONNECTIONS WITH THE APPROPRIATE AGENCY.

2. THE CONTRACTOR IS PARTICULARLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF THE EXISTING UTILITIES SHOWN HEREON IS BASED ON TOPOGRAPHIC SURVEYS AND RECORD DRAWINGS. THE CONTRACTOR SHALL NOT RELY UPON THIS INFORMATION AS BEING EXACT OR COMPLETE. SHOULD UNCHARTED UTILITIES BE ENCOUNTERED DURING EXCAVATION OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR INSTRUCTIONS. THE CONTRACTOR SHALL CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION AND REQUEST FIELD VERIFICATION OF UTILITY LOCATIONS.

3. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED UTILITY WORK PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

4. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE SEQUENCING OF CONSTRUCTION FOR ALL UTILITY LINES SO THAT WATER LINES AND UNDERGROUND ELECTRIC CONDUITS DO NOT CONFLICT WITH SANITARY SEWERS OR STORM SEWERS. INSTALL UTILITIES PRIOR TO PAVEMENT CONSTRUCTION.

5. ADJUST ALL EXISTING UTILITY SURFACE FEATURES INCLUDING BUT NOT LIMITED TO CASTINGS, VALVE BOXES, PEDESTALS, CLEANOUTS, ETC. TO MATCH PROPOSED FINISHED GRADES, UNLESS OTHERWISE INDICATED.

6. CONTRACTOR IS TO COORDINATE WITH EACH UTILITY PROVIDER REGARDING INSTALLATION OF UTILITY CONDUITS FOR ELECTRICAL WORK. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR FOR THE TRENCHING AND CONDUIT INSTALLATION. COST FOR INSTALLATION AND MATERIALS SHALL BE INCLUDED IN VARIOUS BID ITEMS.

DATUM AND TOPOGRAPHIC SURVEY

VERTICAL DATUM: NAVD88 (GEIOD 12A)

HORIZONTAL DATUM: NAD83 NORTH ZONE (2011)

BENCHMARKS TABLE:

CONTROL POINTS			
CONTROL POINT NO.	NORTHING	EASTING	ELEVATION
16	1356619.682'	409503.329'	811.576'
17	1357146.573'	409614.972'	816.632'
1000	1356377.623'	409670.92'	808.985'
1001	1356664.538'	409548.924'	806.256'

DATUM NOTES:

1. SITE BENCHMARKS OBTAINED FROM AWK CONSULTING ENGINEERS, INC. USING GROUND SURVEY TECHNIQUES IN MAY 2018.

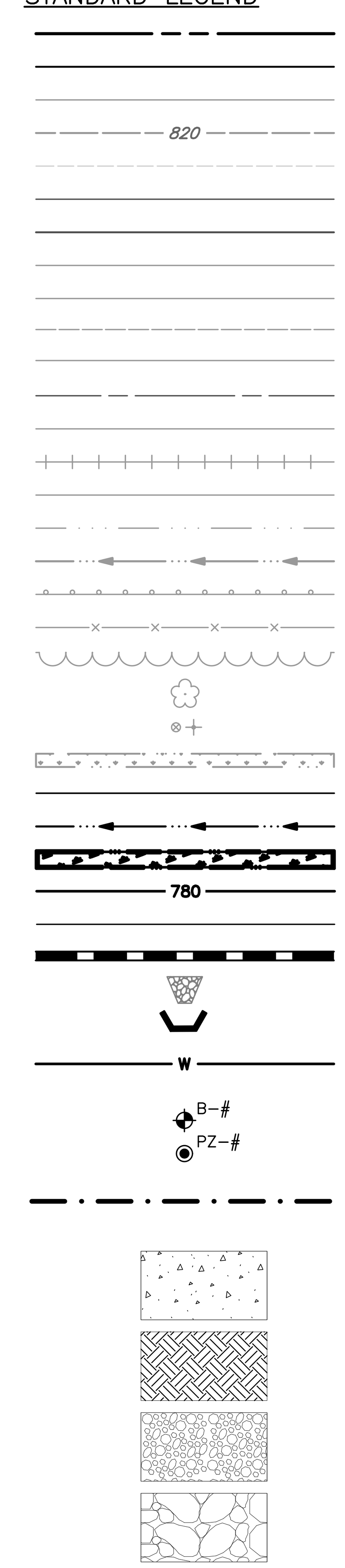
REFERENCE

1. PANTHER HOLLOW LAKE BATHYMETRICAL SURVEY PERFORMED BY AWK CONSULTING ENGINEERS, INC., DATED OCTOBER 2017.
2. POTHOLING UTILITY INVESTIGATION PERFORMED BY TERRA TESTING INC., DATED OCTOBER AND NOVEMBER 2018.
3. EXISTING TOPOGRAPHY AND CONTOURS DERIVED FROM PHOTOGRAMETRY SURVEY PERFORMED BY LAND MAPPING, INC. DATED NOVEMBER 2016, AWK CONSULTING ENGINEERS, INC. FIELD SURVEY, DATED JUNE 2018, CIVIL & ENVIRONMENTAL CONSULTANTS, INC. FIELD SURVEY, DATED JULY–AUGUST 2018, AND ALLEGHENY COUNTY, PA LIDAR, DATED 2017.
4. STREAM AND WETLAND DELINEATION PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. DATED MAY–JULY 2018.

STANDARD ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE
ALT	ALTERNATE
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
B.O.	BY OTHERS
℄	CENTERLINE
CIP	CAST–IN–PLACE, CAST IRON PIPE
CONC	CONCRETE
CWL	CONTRACTOR WORK LIMITS
CY	CUBIC YARD
DIA	DIAMETER
DWG	DRAWING
E&S	EROSION AND SEDIMENT
EL	ELEVATION
EXIST	EXISTING
FT	FOOT, FEET
GA	GAGE
HDPE	HIGH–DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
IN	INCH, INCHES
LB	POUND, POUNDS
LOD	LIMITS OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
MISC	MISCELLANEOUS
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NO	NUMBER
NTS	NOT TO SCALE
O&M	OPERATION AND MAINTENANCE
OD	OUTSIDE DIAMETER
OPNG	OPENING
PA	PENNSYLVANIA
PI	POINT OF INTERSECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
REINF	REINFORCEMENT
REQ'D	REQUIRED
SCH	SCHEDULE
STA	STATION
STD	STANDARD
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
WP	WORK POINT

STANDARD LEGEND



EXISTING PROPERTY LINE
EXISTING BUILDING
EXISTING AUXILIARY BUILDING
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
EXISTING CURB
EXISTING EDGE ROAD
EXISTING EDGE OF SIDEWALK
EXISTING EDGE OF CONCRETE TRAIL
EXISTING EDGE OF UNPAVED TRAIL
EXISTING EDGE OF PAVED DRIVEWAY
EXISTING ROAD CENTERLINE
EXISTING BRIDGE
EXISTING RAILROAD
EXISTING WALL
EXISTING BODY OF WATER
EXISTING STREAM
EXISTING GUIDERAIL
EXISTING FENCE
EXISTING TREE/SHRUB LINE
EXISTING TREE
EXISTING POST/SIGN
EXISTING GIS WETLAND
PROPOSED PAVED LIMITS
PROPOSED ROADSIDE DITCH
PROPOSED WETLAND
PROPOSED INDEX CONTOUR
PROPOSED INTERMEDIATE CONTOUR
PROPOSED STORM SEWER LINE
PROPOSED RIPRAP OUTFALL APRON
PROPOSED HEADWALL/ENDWALL
PROPOSED WATERLINE
GEOTECHNICAL BORING LOCATION
PIEZOMETER INSTALLATION LOCATION
PROPOSED CONTRACTOR LIMITS OF DISTURBANCE

CONCRETE
EARTH
GRAVEL
RIPRAP

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DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

GENERAL NOTES/LEGEND/ABBREVIATIONS
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: G101

SITE PREPARATION PLAN

SCALE: 1" = 30'

0 30 60

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EXISTING CONDITIONS PLAN
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: C100

SITE PREPARATION PLAN

SCALE: 1" = 30'

0 30 60

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SITE PREPARATION PLAN
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: C200

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PANTHER HOLLOW LAKE AND FOREBAY POND PLAN

SCALE 1"=30'
0 30 60

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DRAWN BY:	CLR	CHECKED BY:	JAL	APPROVED BY:	PJS
DATE:	OCTOBER 2019	DWG SCALE:	1"=30'	PROJECT NO:	174-960

PROPOSED SITE GRADING PLAN
PANTHER HOLLOW LAKE DAM RESTORATION
AND FOREBAY POND

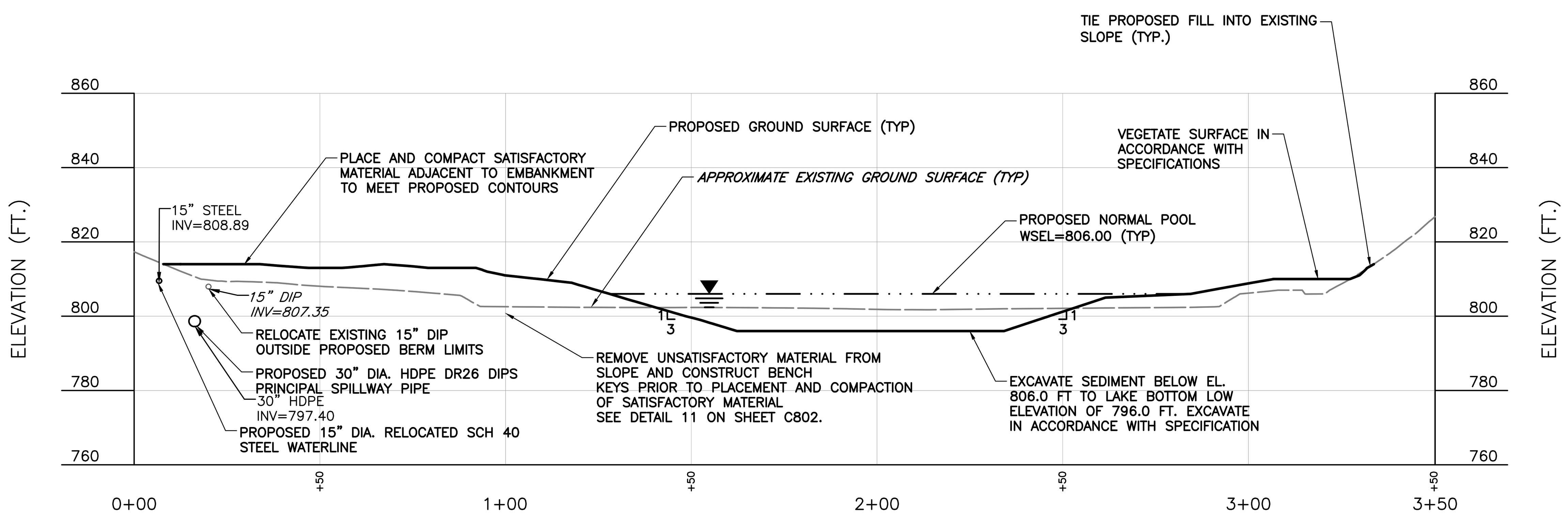
DRAWING NO.: **C300**

PANTHER HOLLOW LAKE - LONGITUDINAL SECTION A

SCALE H:1"=30'; V:1"=15'

SCALE IN FEET 0 30 60

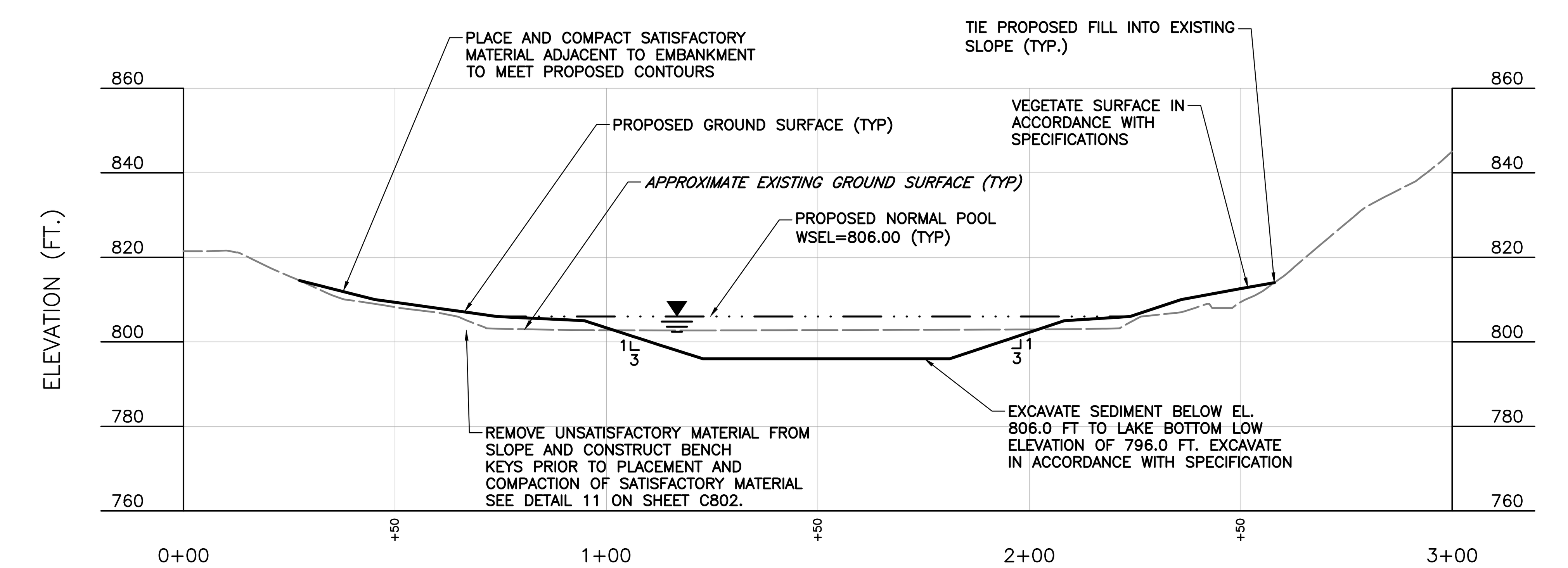
SCALE IN FEET 0 15 30



PANTHER HOLLOW LAKE - SECTION B

SCALE H:1"=30'; V:1"=30'

SCALE IN FEET 0 30 60



PANTHER HOLLOW LAKE - SECTION C

SCALE H:1"=30'; V:1"=30'

SCALE IN FEET 0 30 60

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DATE:	OCTOBER 2019	DWG SCALE:	AS-SHOWN	PROJECT NO:	174-960

PANTHER HOLLOW LAKE SECTION VIEWS
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

DRAWING NO.: **C301**

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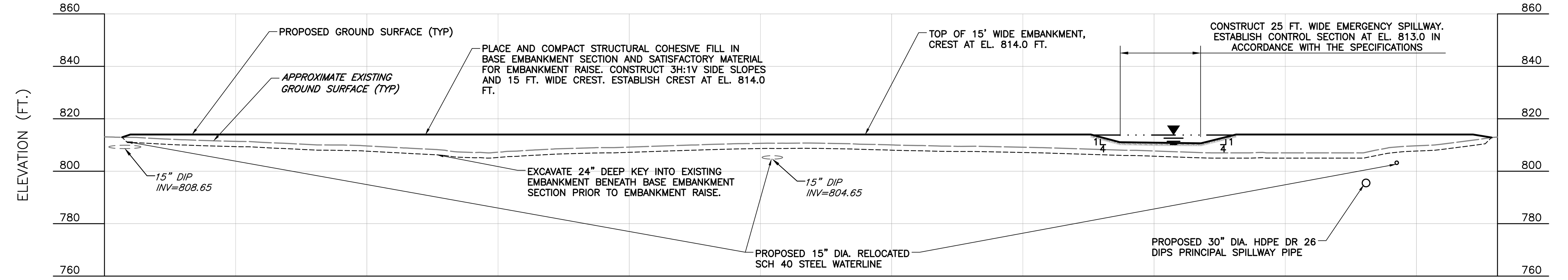
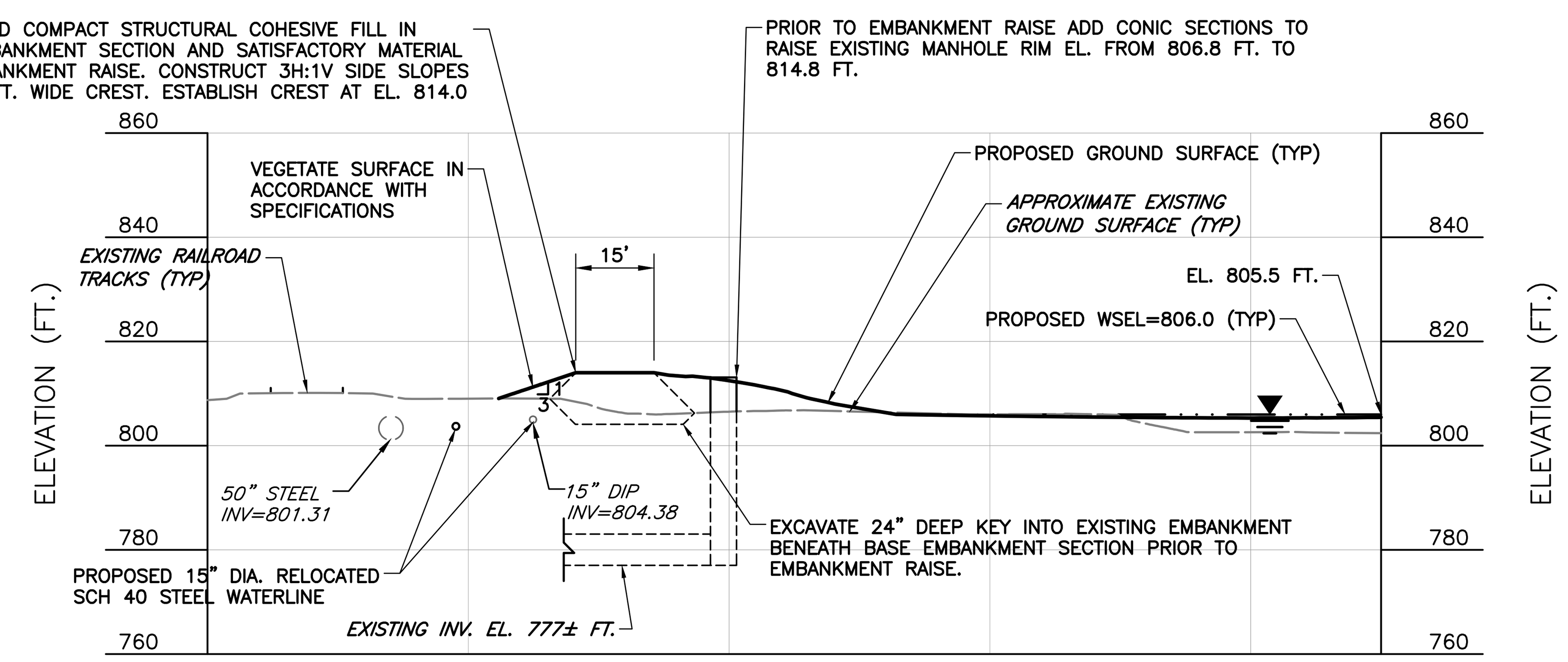


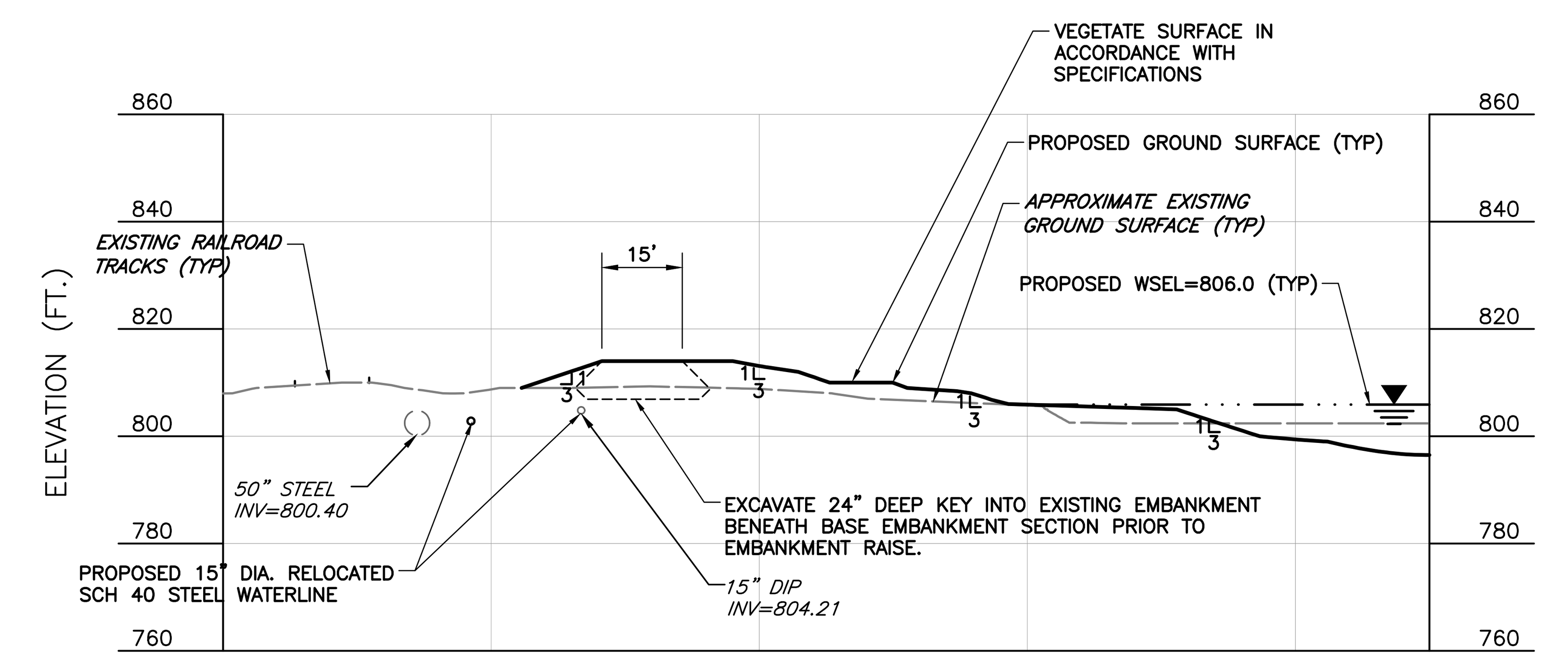
PANTHER HOLLOW LAKE - EMBANKMENT PROFILE

SCALE H:1"=30'; V:1"=30'



LAKE EMBANKMENT - SECTION D

SCALE H:1"=30'; V:1"=30'



LAKE EMBANKMENT - SECTION E

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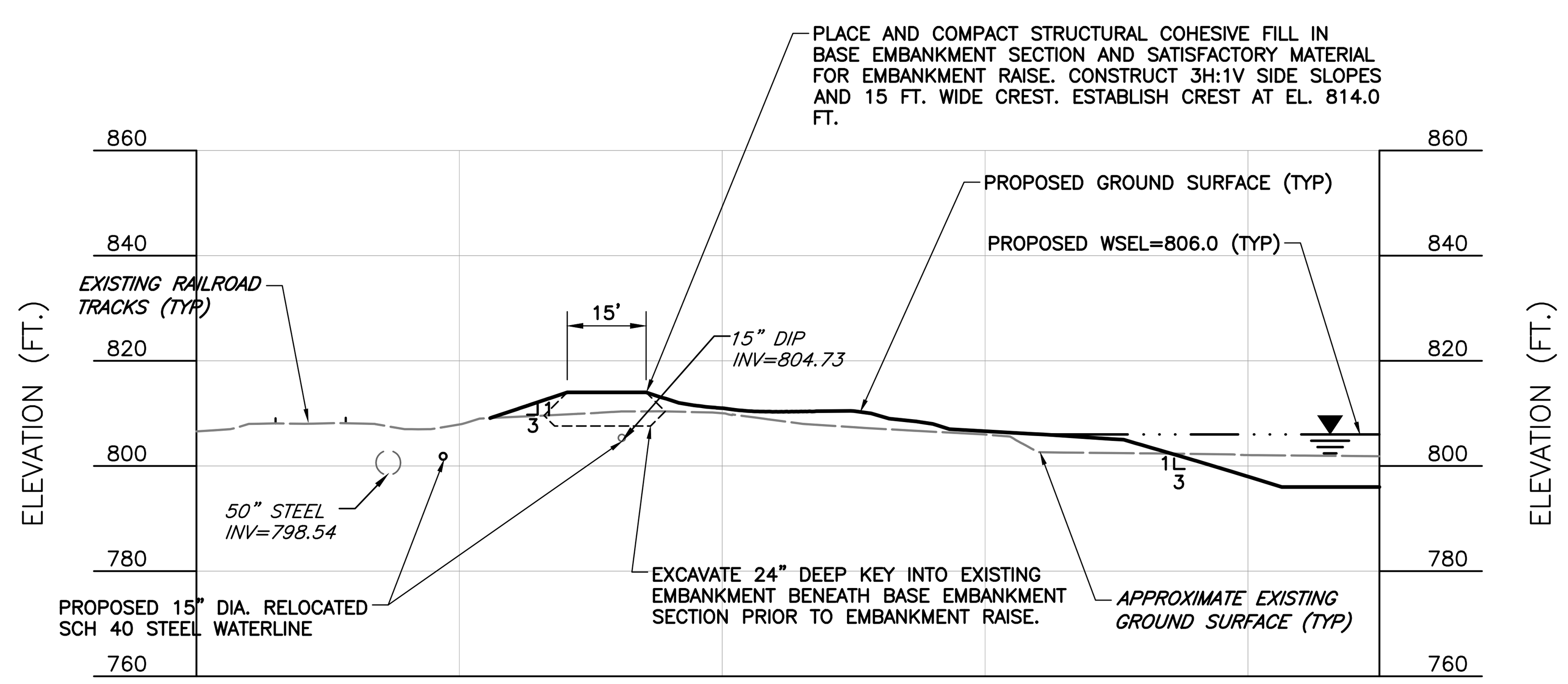
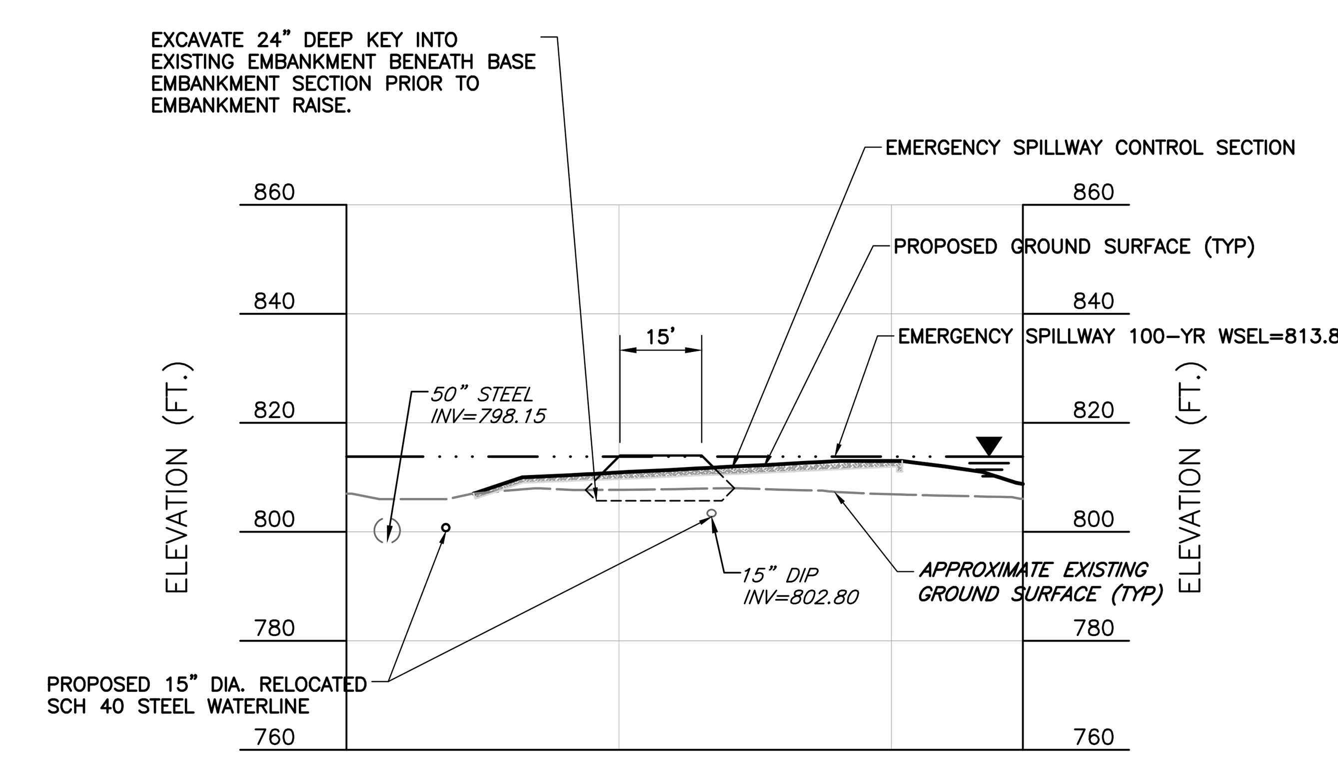


LAKE EMBANKMENT - SECTION F

SCALE H:1"=30'; V:1"=30'



LAKE EMBANKMENT - SECTION G

SCALE H:1"=30'; V:1"=30'

SCALE IN FEET
0 30 60

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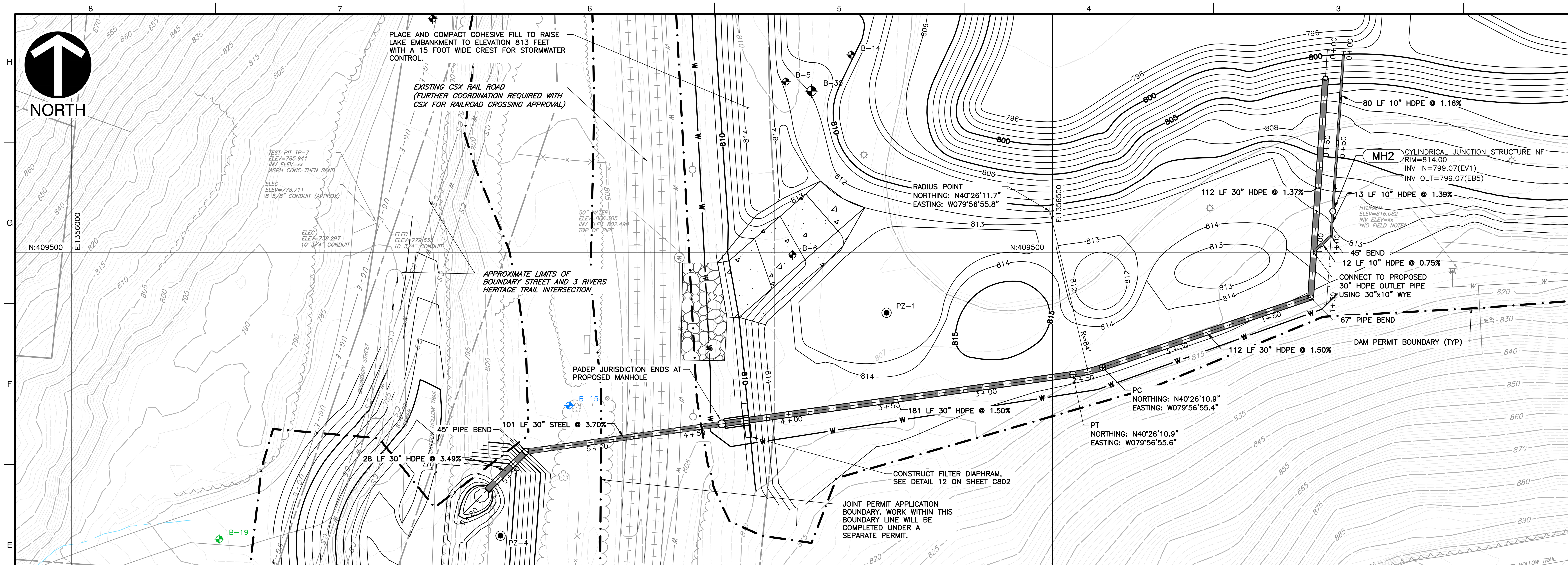
LAKE EMBANKMENT PROFILE AND SECTION VIEWS
PANTHER HOLLOW LAKE
REHABILITATION PROJECT

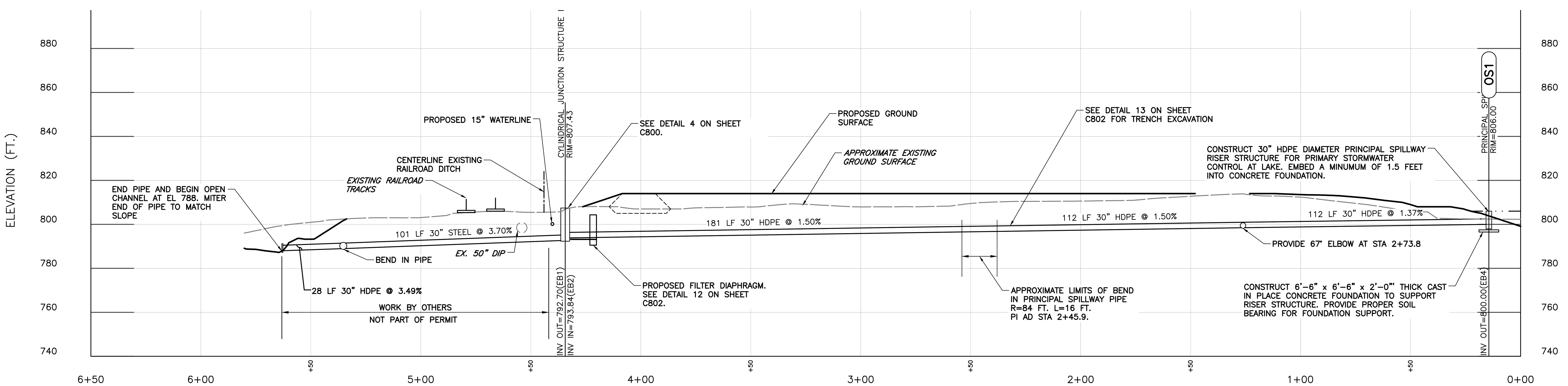
DRAWING NO.: C302



PRINCIPAL SPILLWAY PLAN

SCALE IN FEET

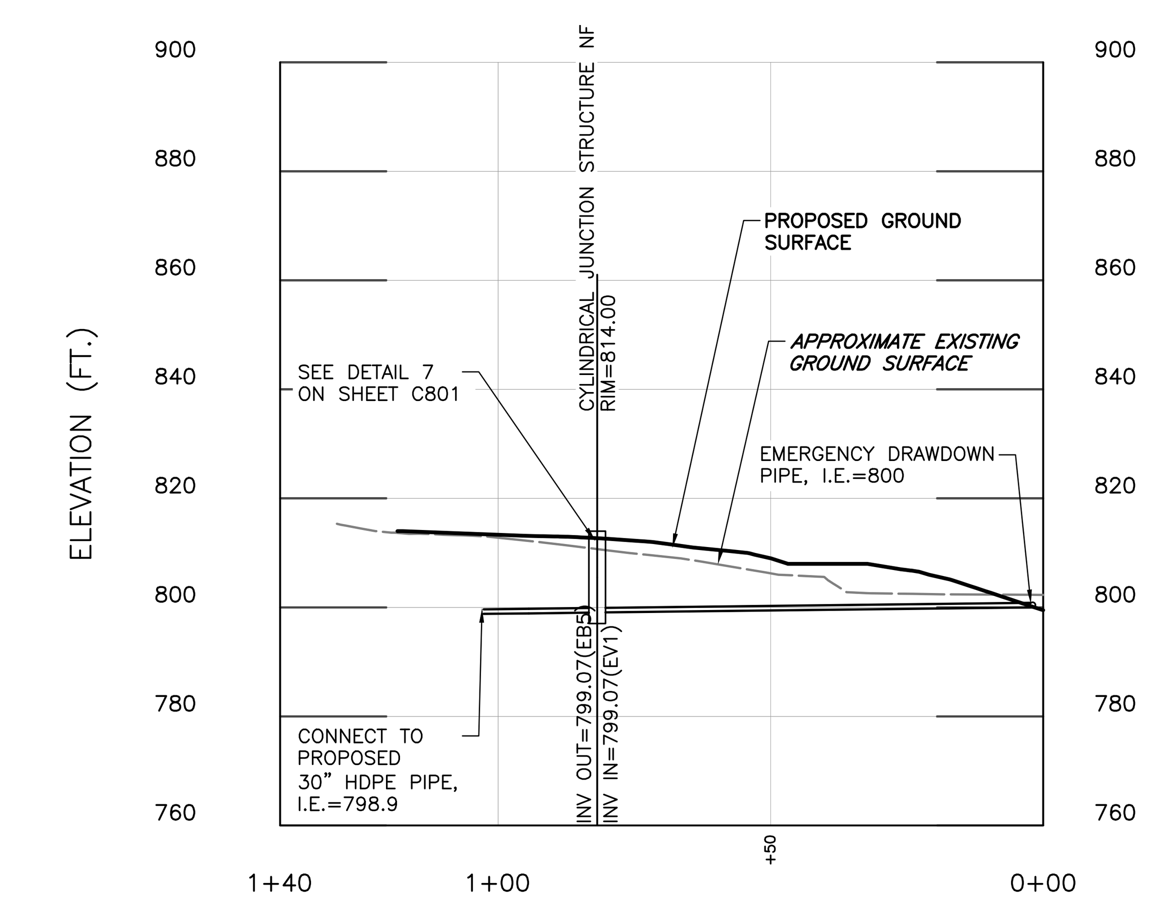
0 30 60



PRINCIPAL SPILLWAY PROFILE

SCALE IN FEET

0 30 60



LOW LEVEL EMERGENCY PIPE PROFILE

SCALE IN FEET

0 30 60

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PANTHER HOLLOW LAKE PRINCIPAL AND EMERGENCY SPILLWAY
PLAN & PROFILE VIEW

DRAWING NO.: C400

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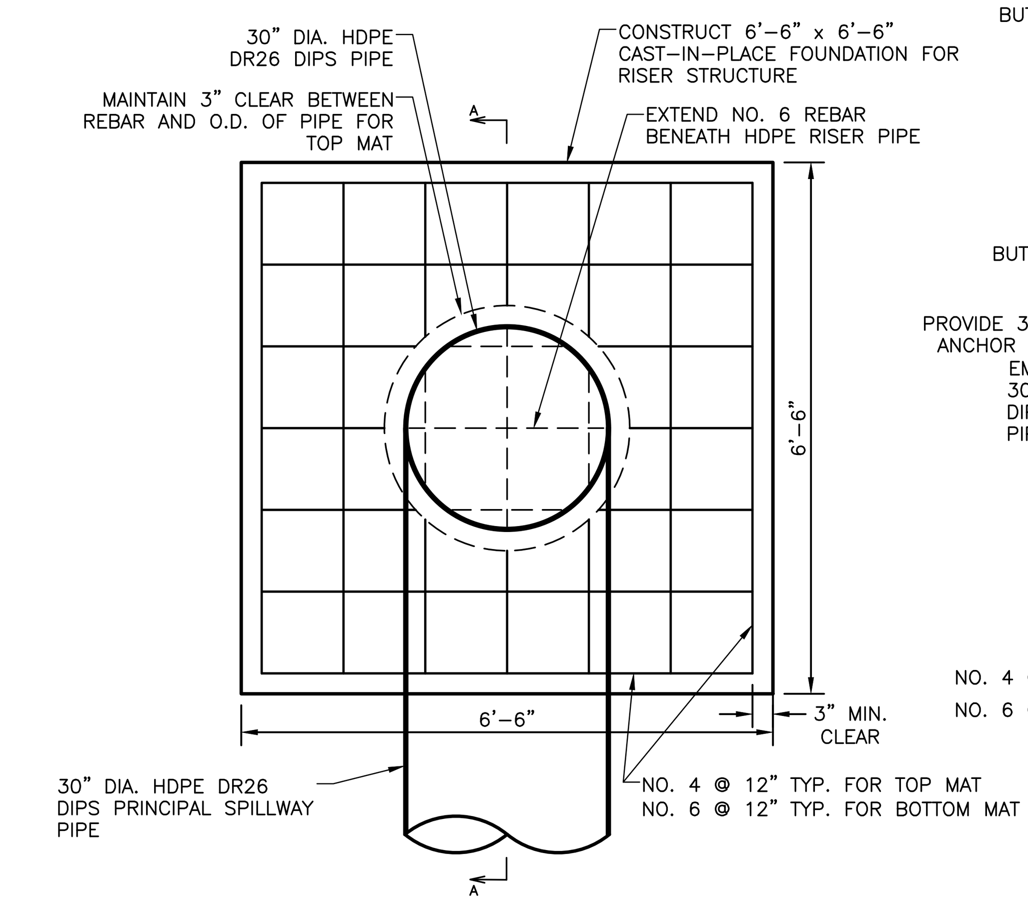
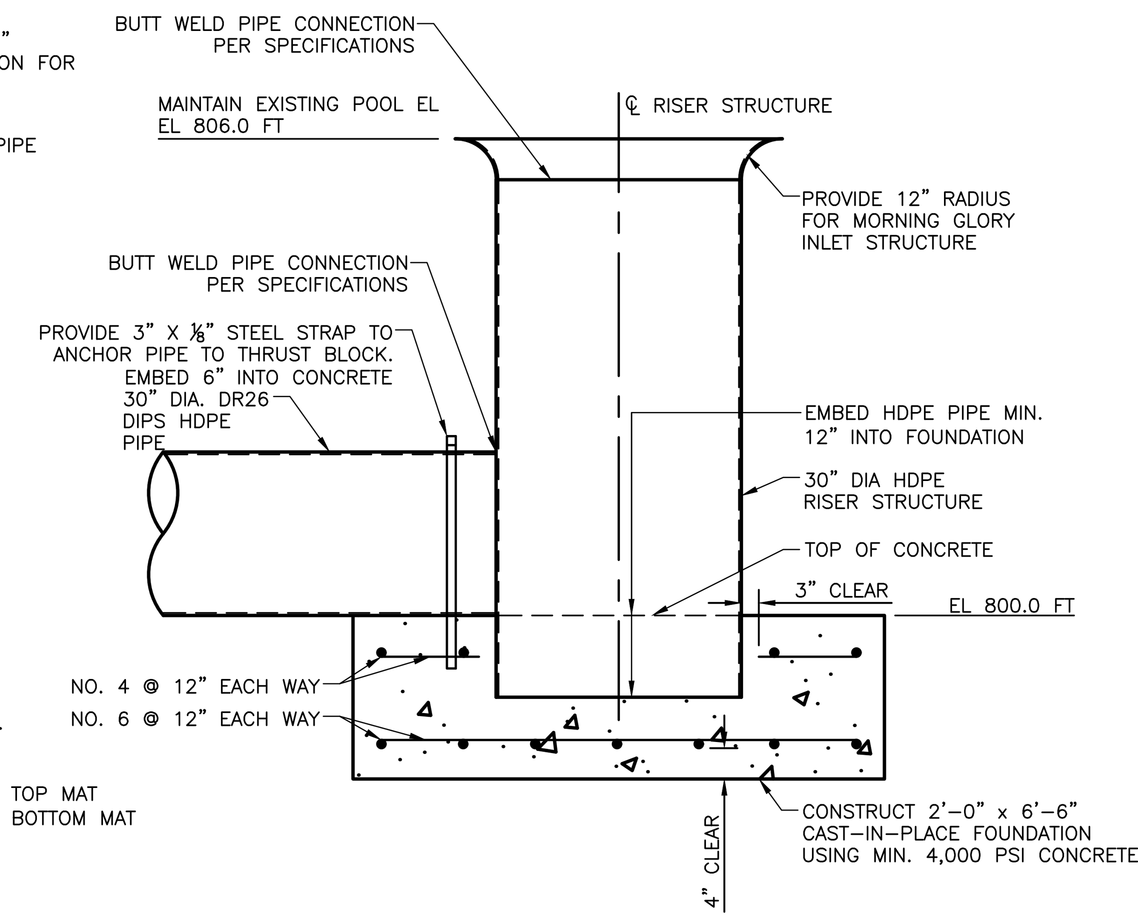
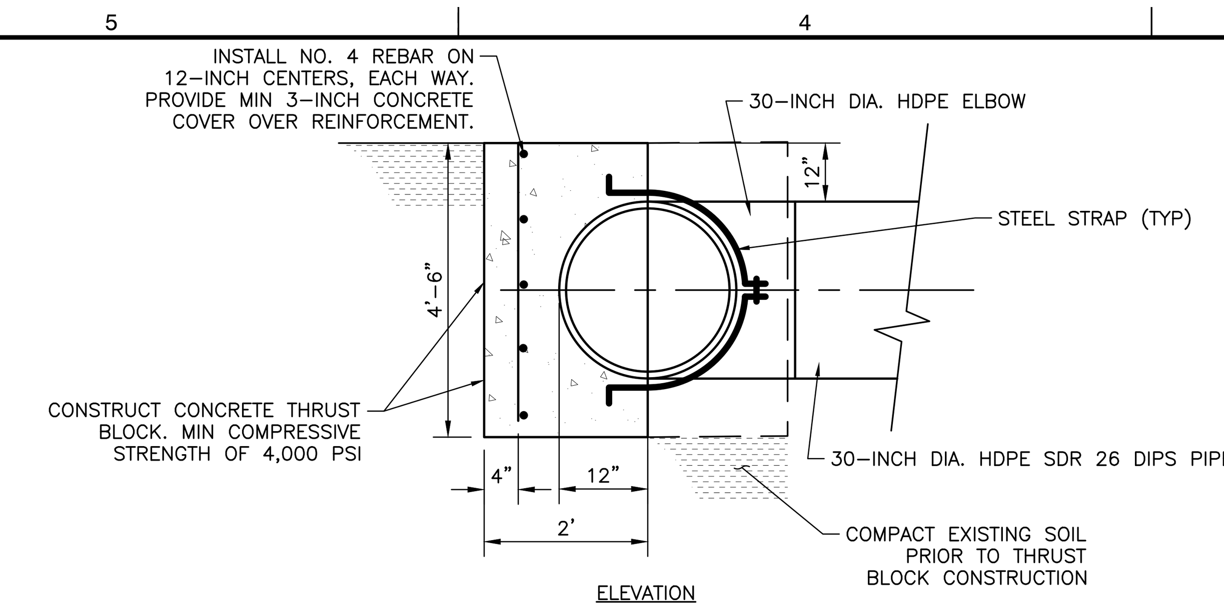
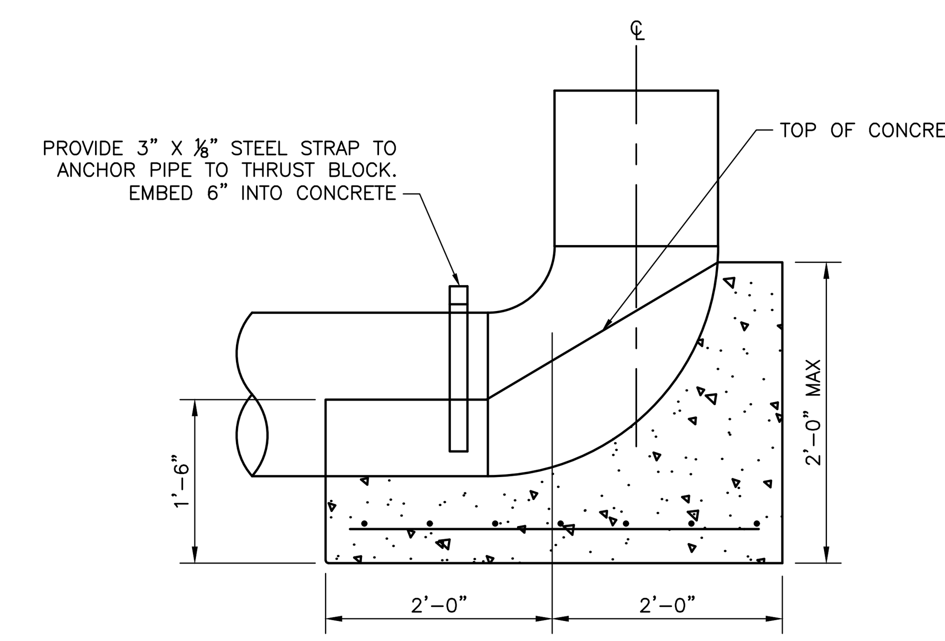


DETAIL 1
RISER STRUCTURE PLAN AND REINFORCEMENT
SCALE ½" = 1'-0"

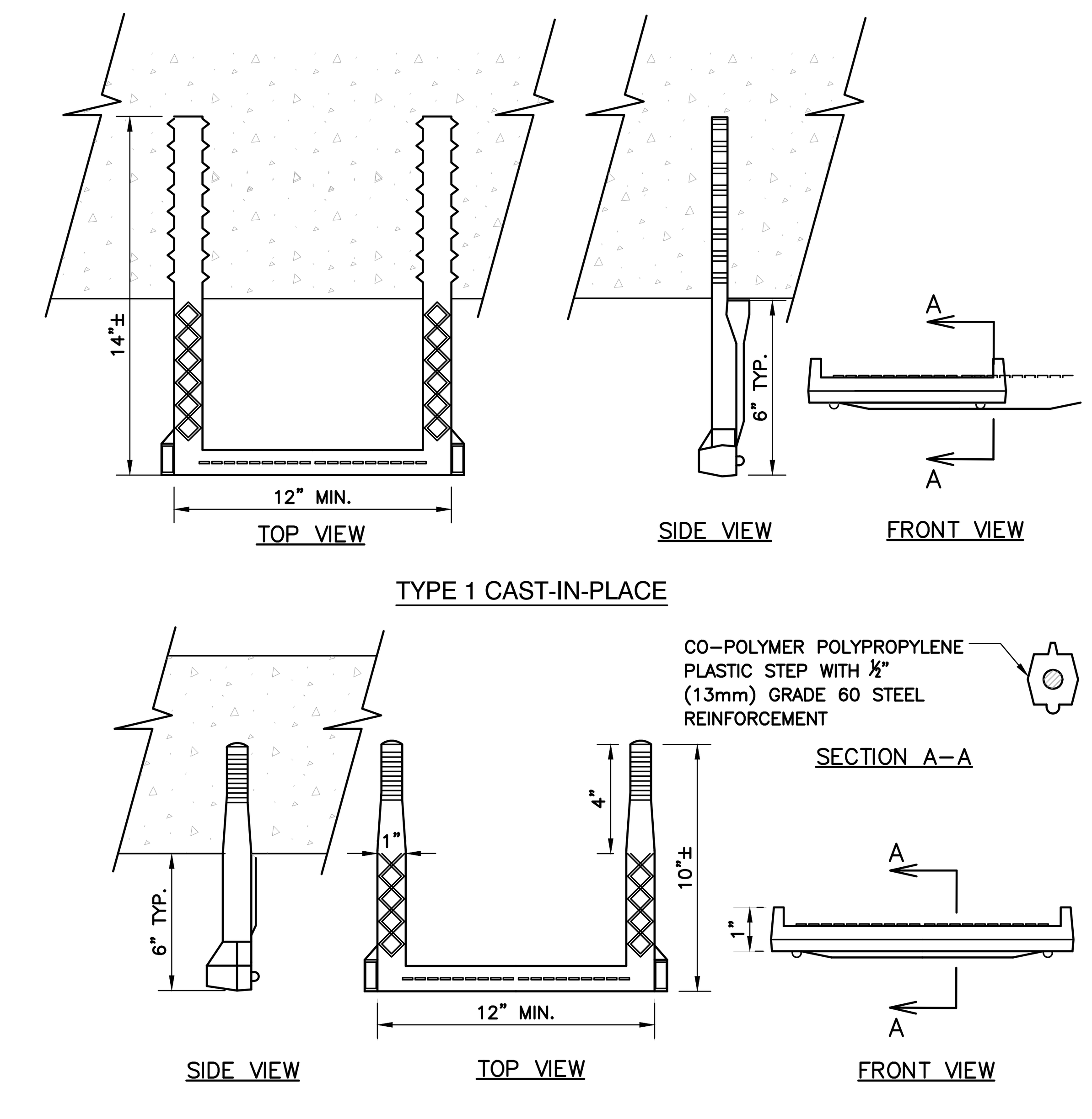


SECTION A-A
SCALE ½" = 1'-0"





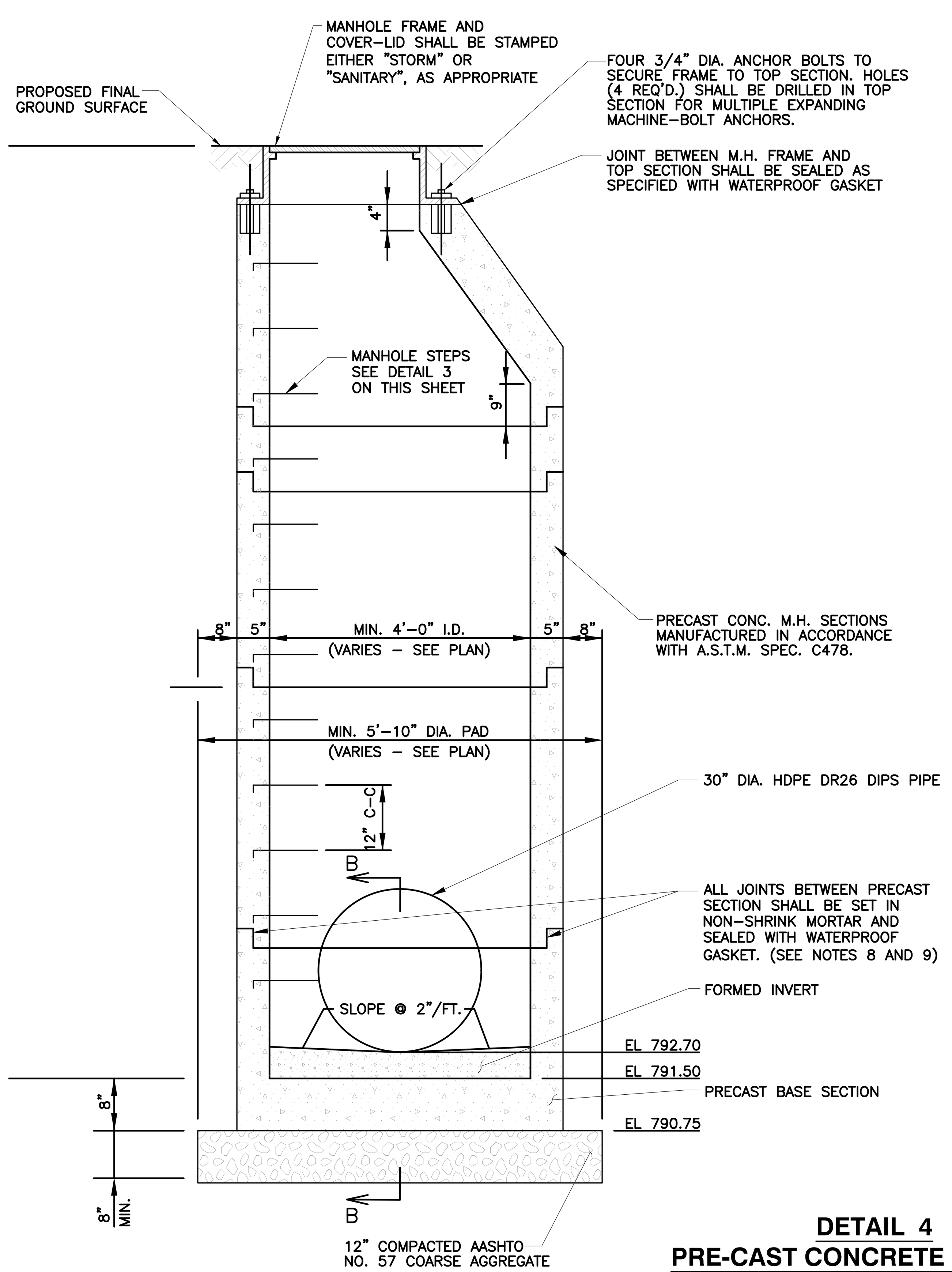
DETAIL 2
THRUST BLOCK - PLAN
N.T.S.



NOTES:

1. TYPICAL STEPS, SPACING AND MATERIAL AS PER ASTM DESIGNATION C-478, AASHTO M-199.
2. PLASTIC SHALL BE A CO-POLYMER POLYPROPYLENE MEETING THE REQUIREMENTS OUTLINED IN ASTM DESIGNATION D-4101 UNDER TYPE II, GRADE 49108.
3. STEEL REINFORCING BAR SHALL BE A ½" (13mm) DEFORMED BAR, GRADE 60 AND CONFORMING TO THE REQUIREMENTS OF ASTM DESIGNATION A-615.
4. USE TYPE 1 FOR CAST-IN-PLACE VAULTS. USE TYPE 2 FOR NEW PRECAST MANHOLES OR WHEN ADDING STEPS TO EXISTING STRUCTURES.
5. ALL STEPS SHALL BE SET VERTICALLY AT 12" CENTER TO CENTER.

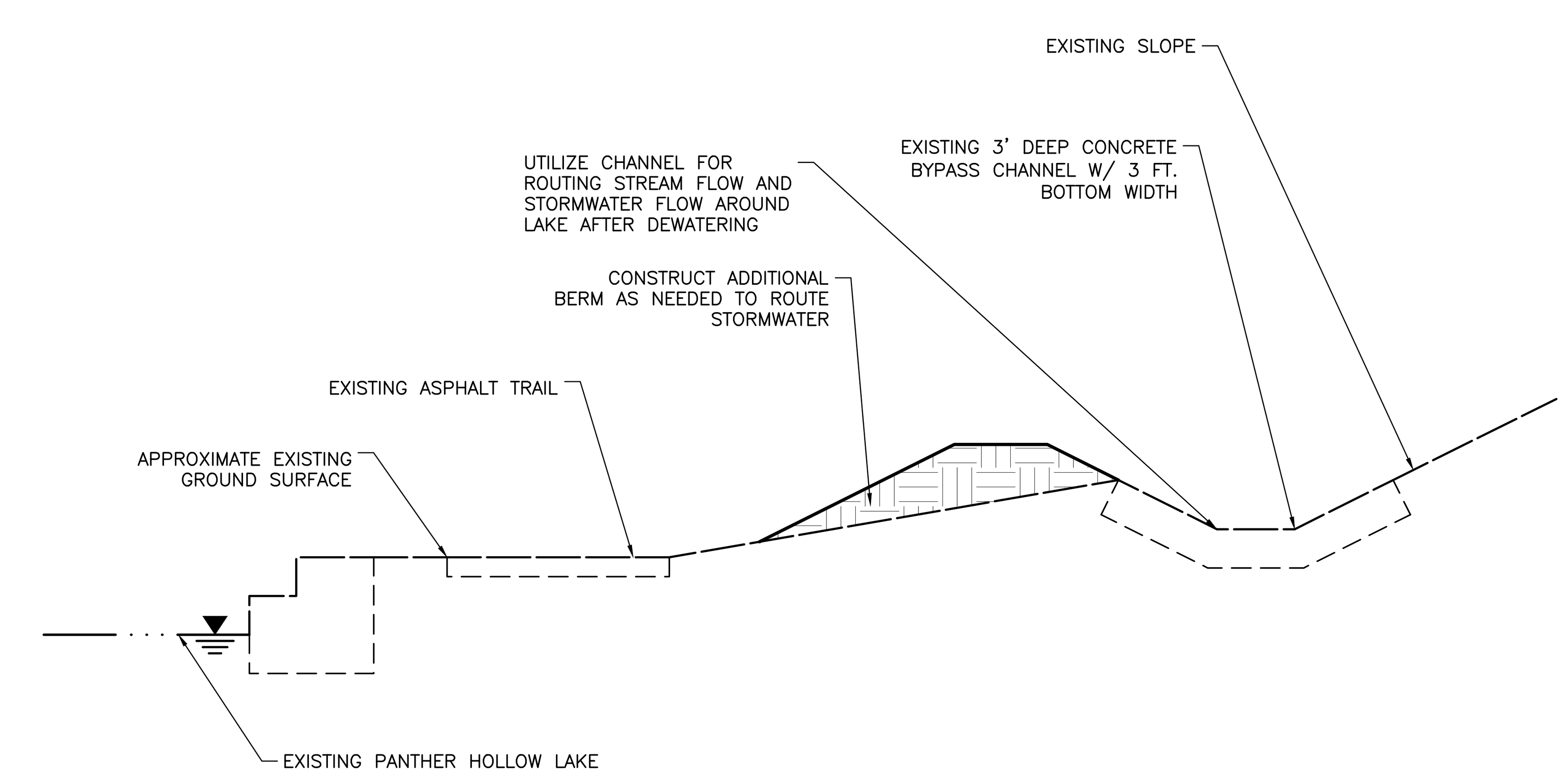
DETAIL 3
PLASTIC MANHOLE STEP
N.T.S.



NOTES:

1. CONSTRUCT IN ACCORDANCE WITH THE REQUIREMENTS OF COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PADOT) PUBLICATION 408, SECTION 605.
2. REFER TO PADOT BUREAU OF HIGHWAY DESIGN'S STANDARDS FOR ROADWAY CONSTRUCTION, SERIES RC-1 TO RC-100, SHEETS 1 THROUGH 5 OF RC-39, FOR DETAILS OF THE MANHOLE SECTIONS, GRADE ADJUSTMENT RINGS, STEPS, FRAMES AND COVERS.
3. ALL CEMENT CONCRETE USED TO CONSTRUCT THE MANHOLES SHALL BE CLASS AA, AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 704.
4. ALL REINFORCEMENT STEEL USED TO CONSTRUCT THE MANHOLES SHALL BE ASTM-A615, GRADE 60, DEFORMED OR PLAIN STEEL BARS, AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 709.1 AND 709.2 (IF APPLICABLE).
5. PRE-CAST REINFORCED CONCRETE MANHOLE SECTIONS AND GRADE ADJUSTMENT RINGS SHALL CONFORM TO THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 714, AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI.
6. ALL FRAMES AND COVERS/GRATES FOR STORM SEWER AND SANITARY SEWER MANHOLES SHALL BE NON-ROCKING AND MADE OF HEAVY DUTY CAST IRON, AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 605.2(b). ALL FRAMES SHALL BE SET IN A FULL BED OF MORTAR AND ANCHORED TO THE CONICAL TOP SECTION USING MINIMUM 4 ANCHOR BOLTS ON OPPOSITE SIDES.
7. ALL GRADE ADJUSTMENT RINGS SHALL BE OF MASONRY OR PRECAST CONCRETE CONSTRUCTION.
8. A RUBBER GASKET THAT SATISFIES THE REQUIREMENTS OF ASTM C-443 SHALL BE INSTALLED BETWEEN ALL STORM SEWER MANHOLE SECTIONS. INSTALL TWO CONTINUOUS RINGS OF BITUMINOUS MASTIC THAT SATISFY ASTM C-443 AT EACH JOINT FOR SANITARY SEWER MANHOLES.
9. ALL MANHOLE SECTIONS SHALL BE SET IN PLACE IN NON-SHRINK MORTAR OR BITUMINOUS MATERIAL AND CONFORM TO THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 705.7.
10. ALL MANHOLES SHALL HAVE LADDER RUNGS, SPACED 12 INCHES APART, TO FACILITATE ACCESS TO THE MANHOLE. ALL LADDER RUNGS SHALL BE MINIMUM NO. 4 REINFORCEMENT BARS THAT ARE COATED WITH CO-POLYMER POLYPROPYLENE PLASTIC THAT MEET THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 605.2(c). ALL LADDER RUNGS MUST MEET THE PERFORMANCE CRITERIA OF ASTM C478.
11. A MINIMUM OF 12" OF AASHTO #57 STONE SHALL BE USED AS BEDDING FOR THE MANHOLES. THE AASHTO #57 STONE SHALL BE PLACED IN MAXIMUM 6-INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 75% OF ITS RELATIVE DENSITY. ALL AASHTO #57 STONE SHALL BE CRUSHED LIMESTONE AND SATISFY THE REQUIREMENTS OF PADOT PUBLICATION 408, SECTION 703. ALL SOIL BACKFILL PLACED AROUND THE MANHOLES, AND ABOVE THE BEDDING, SHALL BE PLACED IN MAXIMUM 8-INCH THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AND WITHIN ±3% OF ITS OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR).
12. A FLEXIBLE RUBBER MANHOLE SLEEVE OR BOOT SHALL BE INSTALLED IN THE PIPE OPENINGS FOR THE SANITARY SEWER MANHOLES BY THE MANHOLE MANUFACTURER PRIOR TO SITE DELIVERY. THE SANITARY SEWER PIPE SHALL BE SECURED TO THE SLEEVE/BOOT USING STAINLESS STRAPPING UPON INSTALLATION. ANNULAR AREA BETWEEN PIPE OPENING AND CONCRETE BASE SHALL BE RAMMED WITH EMBECO GROUT.

DETAIL 4
PRE-CAST CONCRETE MANHOLE
N.T.S.



DETAIL 5
DEWATERING BYPASS CHANNEL
N.T.S.

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DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 174-960

SITE CONSTRUCTION DETAILS

DRAWING NO.: C800

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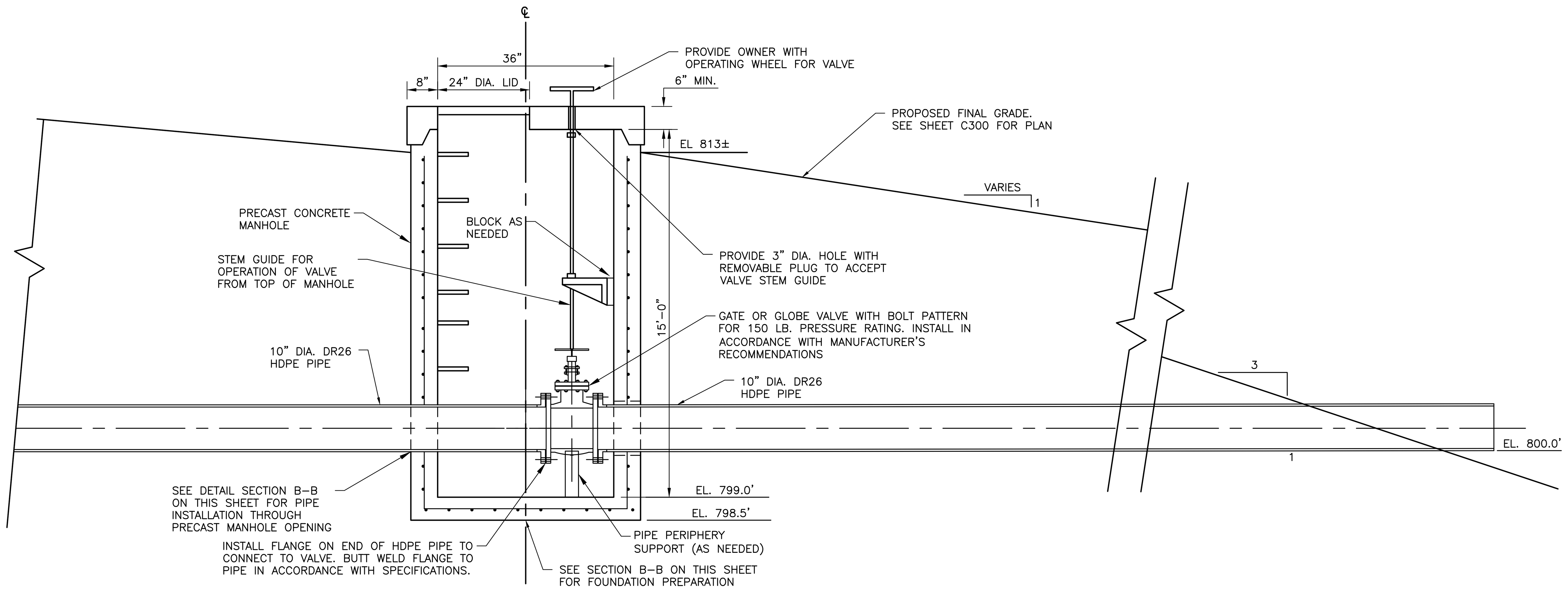
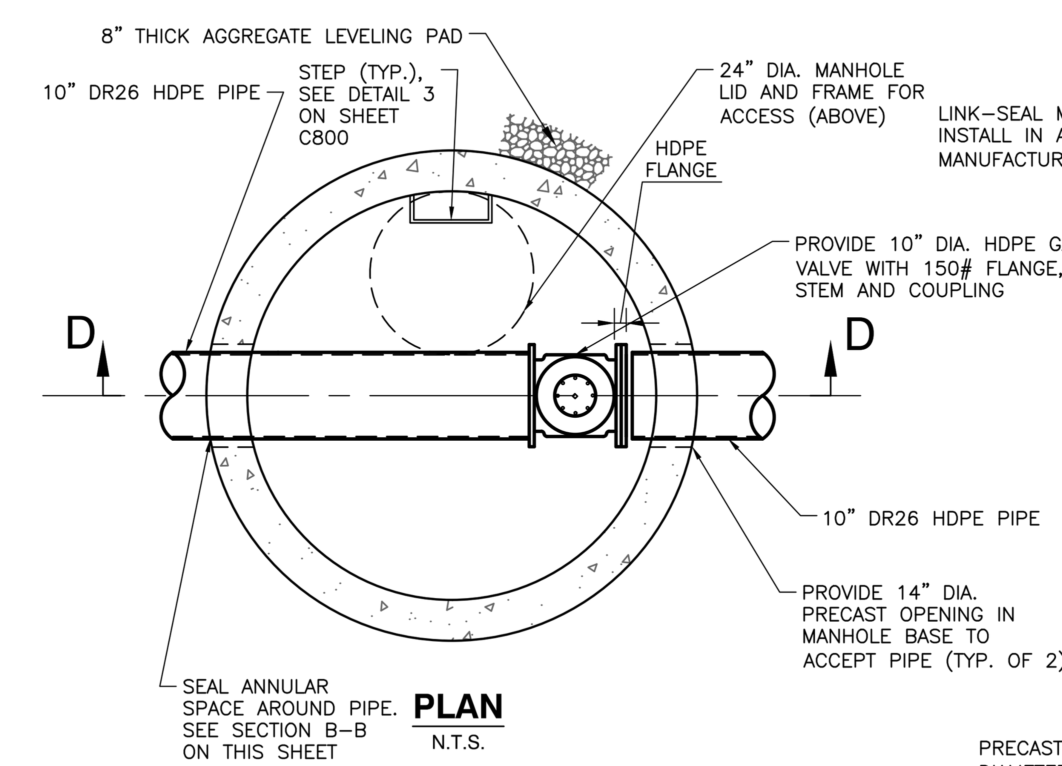


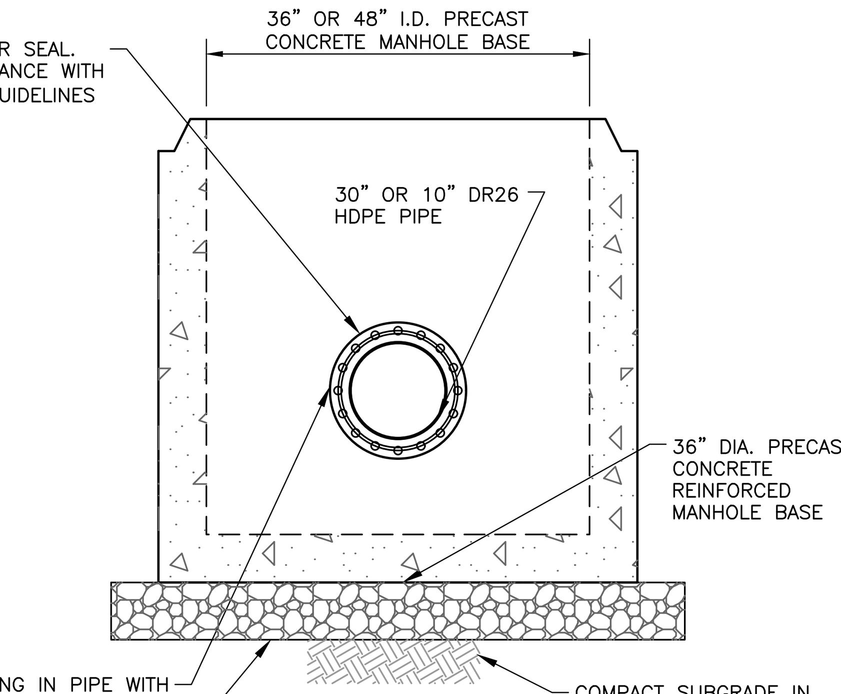
ELEVATION
N.T.S.

DETAIL 7
LOW LEVEL OUTLET
N.T.S.

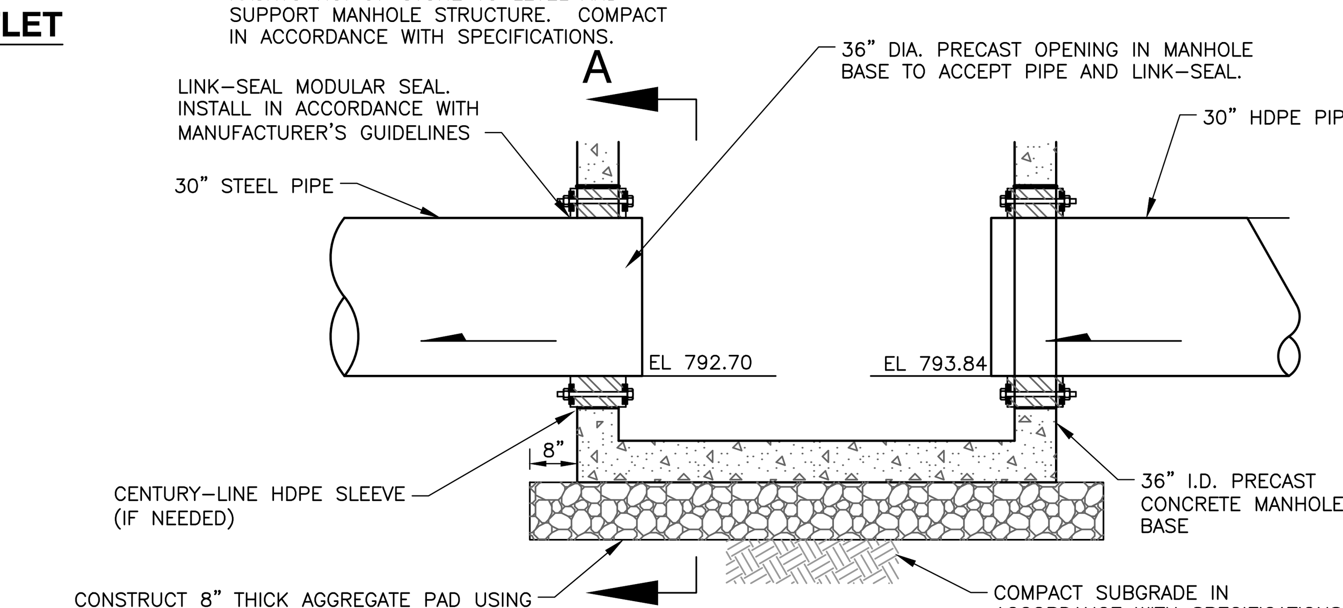


PLAN
N.T.S.

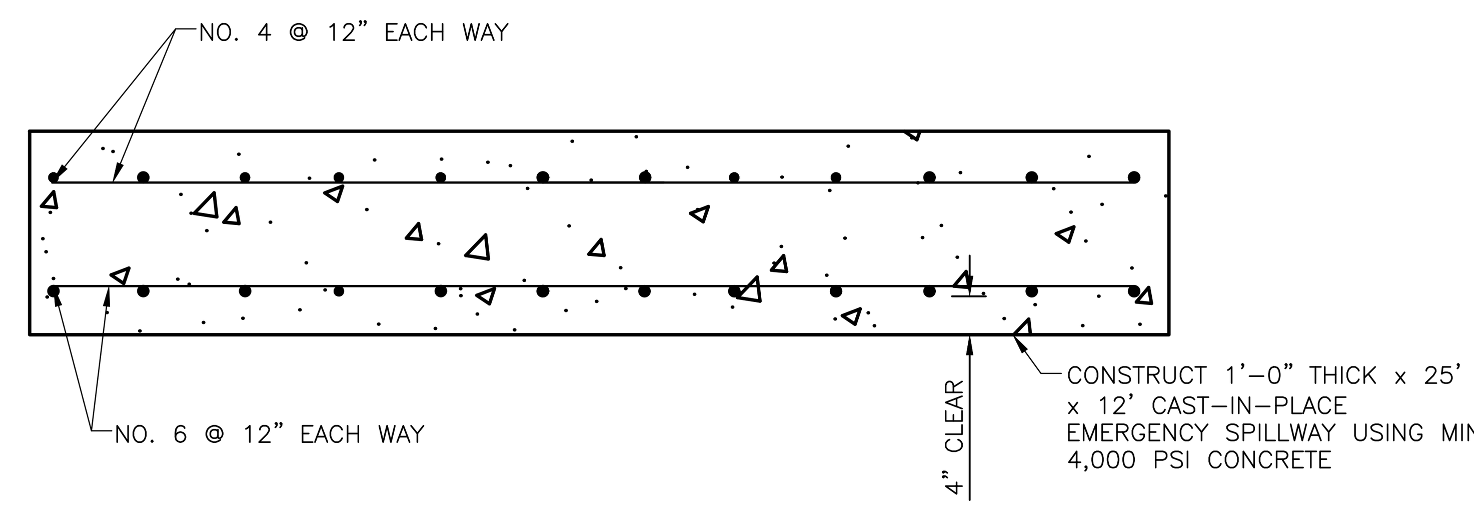
DETAIL 7
LOW LEVEL OUTLET
N.T.S.



SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



DETAIL 6
EMERGENCY SPILLWAY SECTION AND REINFORCEMENT
N.T.S.

Zone 1: Semi-Submerged

Zone 1A

Submerged Aquatics:

Nuphar spp.
Lilly species

Utricularia spp.
Bladderwort species

Zone 1B

Herbaceous:

Peltandra virginica
arrow arum : broad-leaf, emergent, 2'-4' tall

Pontedaria cordata
pickerelweed : leafy emergent, purple flower, 2'-4' tall

Sagittaria latifolia
duck potato : leafy emergent, white flower, 2'-4' tall

Scirpus tabernaemontanii
soft-stem bulrush : green, long-stemmed, emergent rush, 6'-8' tall

Shrub:

Cephalanthus occidentalis
buttonbush : wetland shrub, up to 8' tall in this setting (shallow soil)

Zone 2: Transitional

Flowering:

Chelone glabra
turtlehead : white flower, 2'-3' tall

Hibiscus moscheutos
swamp rose-mallow : white or pink flowers, tall plant to 6' tall

Iris versicolor
blueflag iris : iris with blue flowers, 2'-3' tall

Mimulus ringens
monkey flower : tubular blue flower, 2'-3' tall

Sedges and Rushes:

Carex comosa
longhair sedge

Carex crinita
fringed sedge

Carex lurida
shallow sedge

Carex stricta
tussock sedge

Carex vulpinoidea
fox sedge

Juncus canadensis
Canada rush

Juncus militaris
bayanet rush

Barrier Plants:

Cephalanthus occidentalis
buttonbush : up to 8' tall shrub

Leersia oryzoides
rice cutgrass : 5' tall, serrated leaves

Rosa palustris
swamp rose : thorny shrub, 6' tall, pink flowers

Zone 3: Water's Edge

Flowering:

Asclepias incarnata
swamp milkweed : pink showy flowers

Aster novi-belgii
New York aster

Chelone glabra
turtlehead : white flower, 2'-3' tall

Eupatorium perfoliatum
boneset : ivory flowers

Hibiscus moscheutos
swamp rose-mallow : white or pink flowers, tall plant to 6' tall

Iris versicolor
blueflag iris : iris with blue flowers, 2'-3' tall

Lobelia cardinalis
cardinal flower : bright red flowers

Mimulus ringens
monkey flower : tubular blue flower, 2'-3' tall

Verbena hastata
blue vervain : violet flowering spikes

Sedges, Rushes, and Grasses:

Elymus virginicus
Virginia wild-rye : 3' tall

Juncus effusus
soft rush : 3' tall

Scirpus cyperinus
woolgrass : 5' tall

Scirpus pungens
common 3 square : 4' tall

Barrier Plants:

Cephalanthus occidentalis
buttonbush : up to 8' tall shrub

Clethra alnifolia
sweet pepperbush : 6' tall

Cornus sericea
redosier dogwood : 8' tall

Ilex verticillata
winterberry holly : 8' tall

Rhododendron viscosum
swamp azalea : 6' tall

Salix discolor
pussy willow : can get very tall for a shrub, up to 20' tall

Zone 4: Upland

Flowering:

Aster novae-angliae
New England aster

Eupatorium coelestinum
blue mistflower

Eupatorium purpureum
purple Joe-pye weed

Rudbeckia hirta
black-eyed susan

Grasses:

Andropogen gerardii
big bluestem

Panicum virgatum
switchgrass

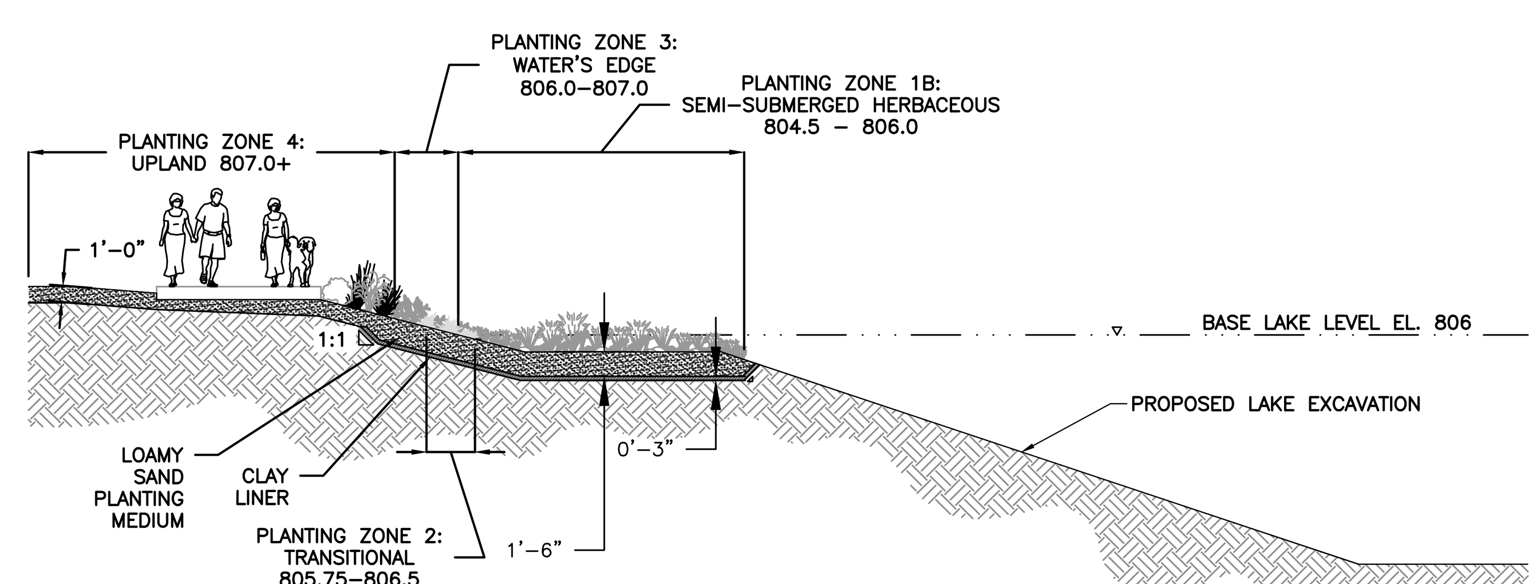
Schizachyrium scoparium
little bluestem

Sorghastrum nutans
Indian grass

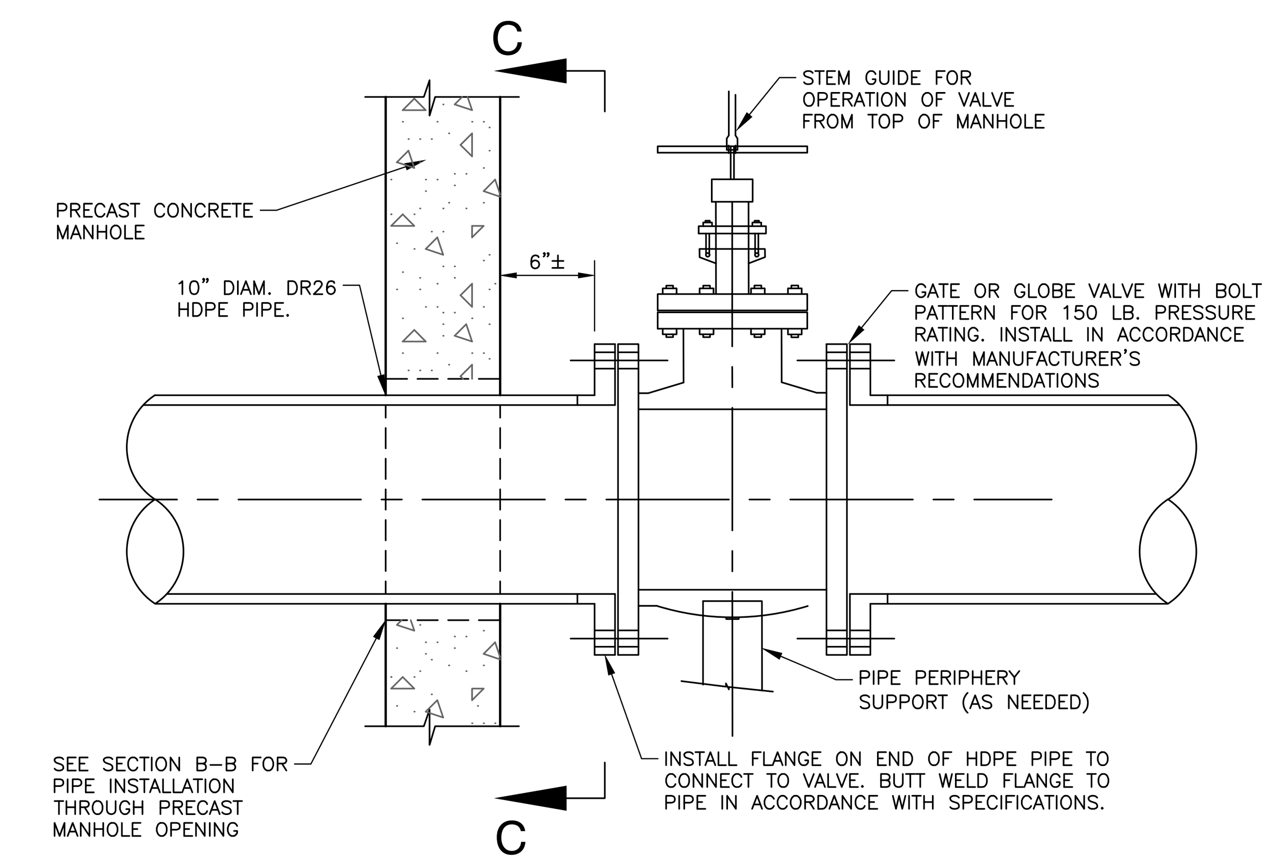
Barrier Plants:

Clethra alnifolia
sweet pepperbush

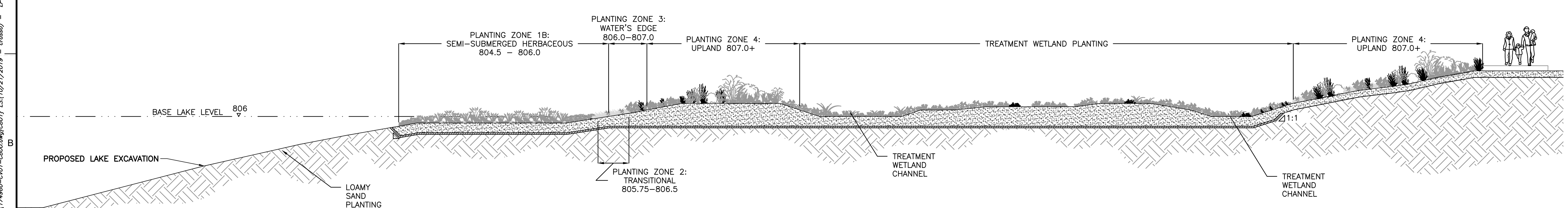
Cornus amomum
silky dogwood



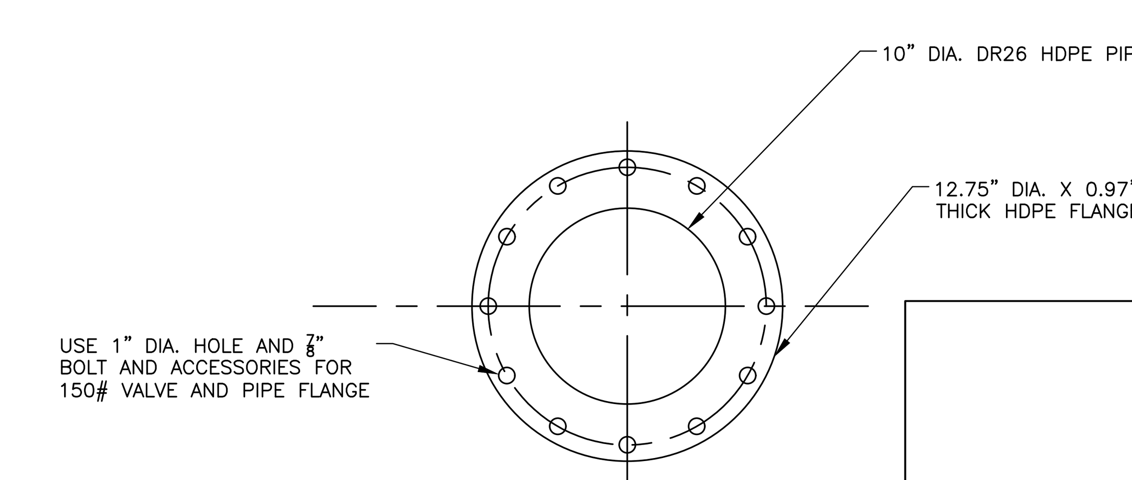
DETAIL 8
NARROW AQUATIC BENCH
SCALE 1"=10'



SECTION D-D
N.T.S.



DETAIL 9
WETLAND CROSS SECTION
SCALE 1"=10'



SECTION C-C
N.T.S.

REVISION RECORD		
NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
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PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

SITE CONSTRUCTION DETAILS

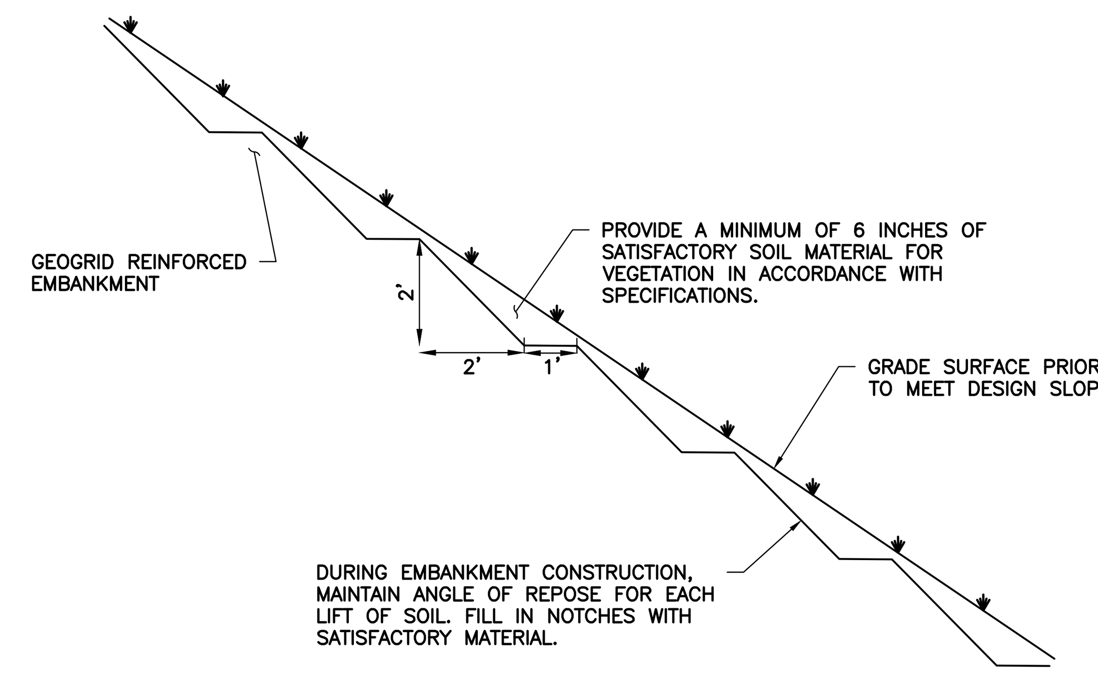
DRAWING NO.: C801

P:\2017\174-960\-CADD\Dwg\Civil2 – Dam Permit\174960-CV01-C800.dwg{C801} LS:(10/21/2019 – crasso) – LP: 10/21/2019 4:52 PM

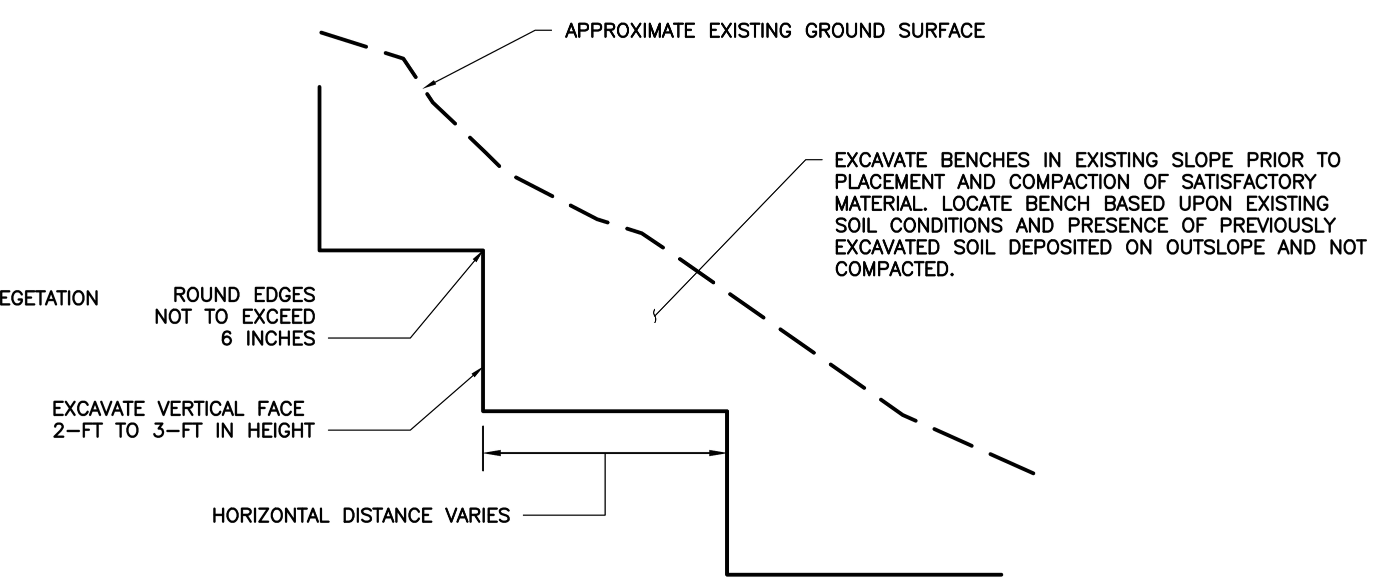
FILTER MATERIAL GRADATION

SIEVE SIZE	% PASSING BY WEIGHT
3/8 IN.	100
NO. 4	95–100
NO. 16	45–85
NO. 50	5–30
NO. 100	0–10

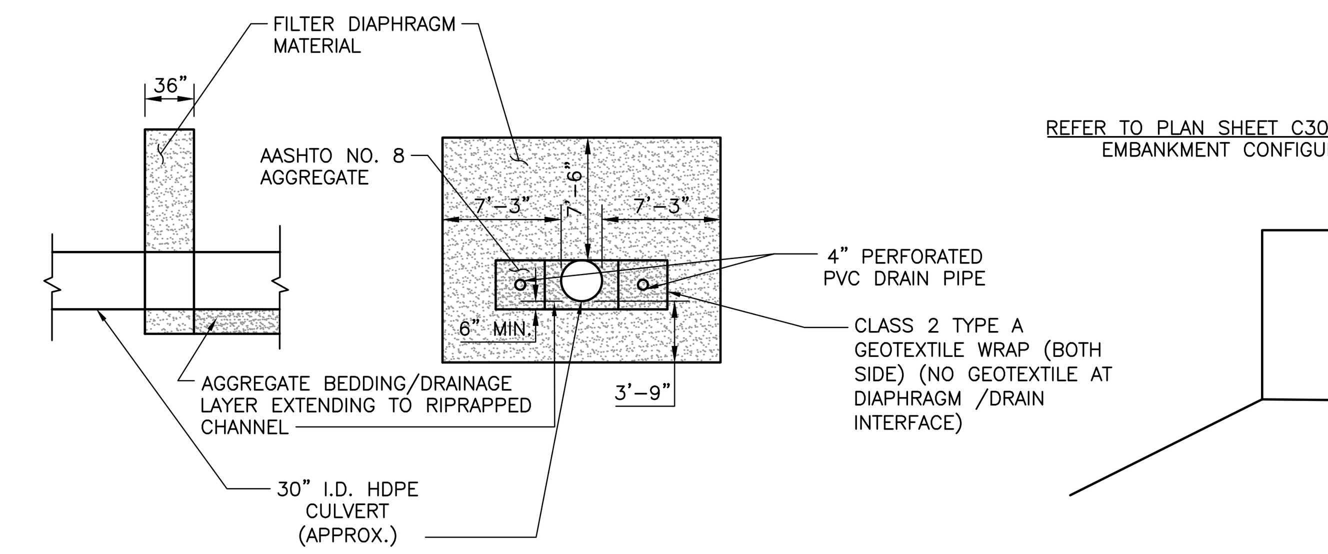
ASTM, C-33 FINE AGGREGATE



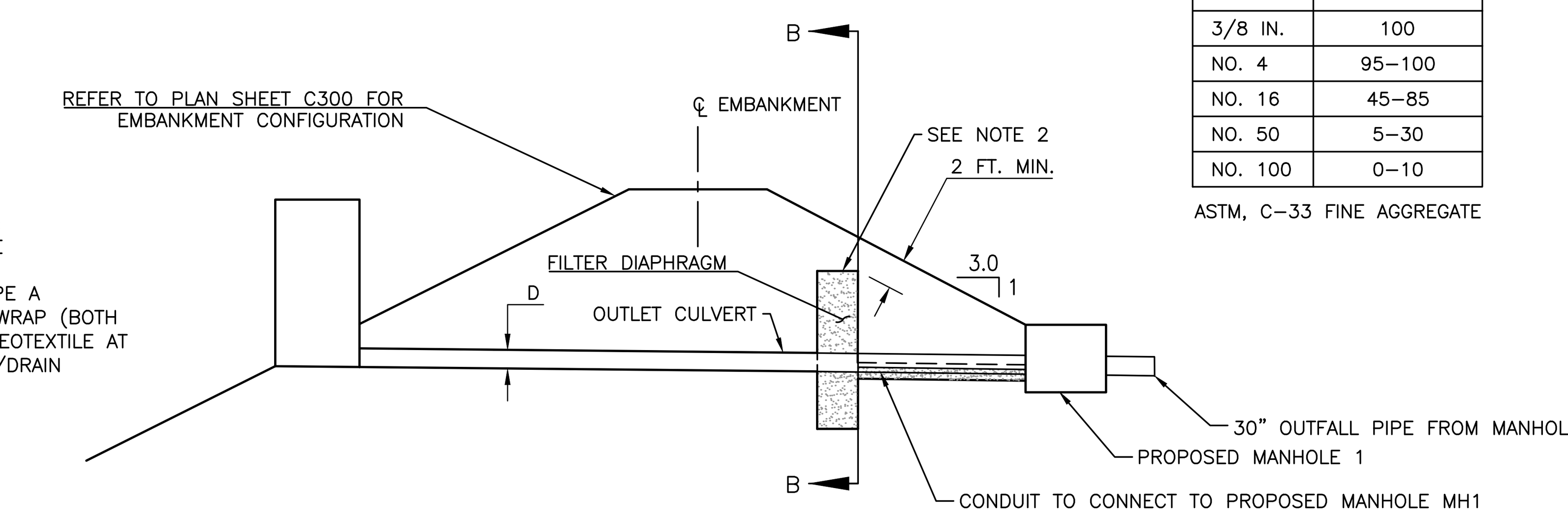
DETAIL 10
FINISHED GRADE DETAIL
N.T.S.



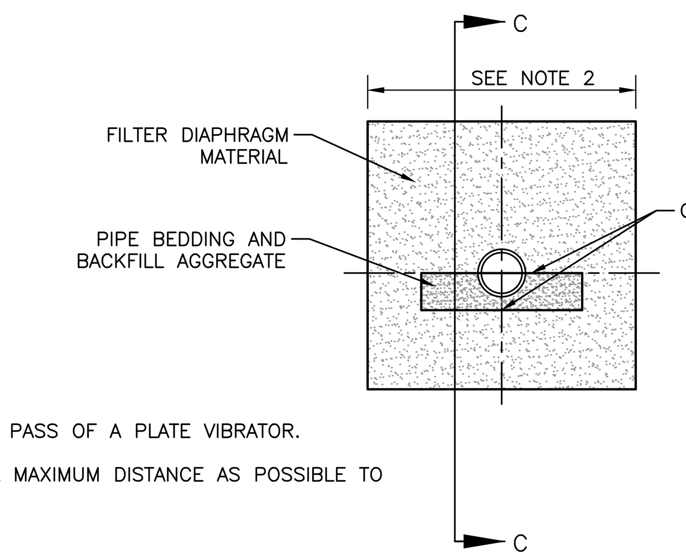
DETAIL 11
BENCHING DETAIL
N.T.S.



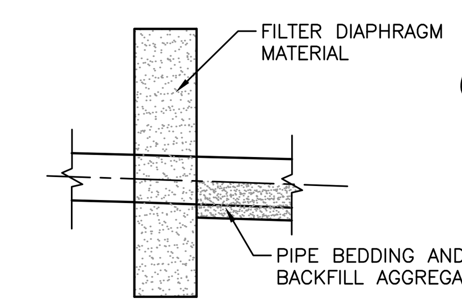
DETAIL 12
FILTER DIAPHRAGM DETAIL
N.T.S



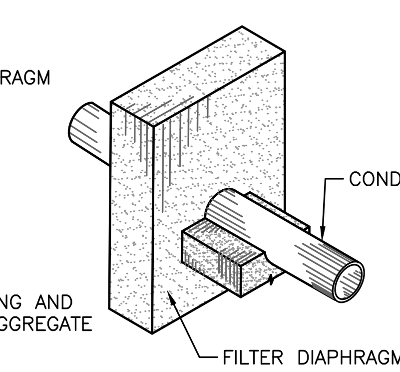
PROFILE ALONG CENTERLINE OF CONDUIT



SECTION B-B



SECTION C-C

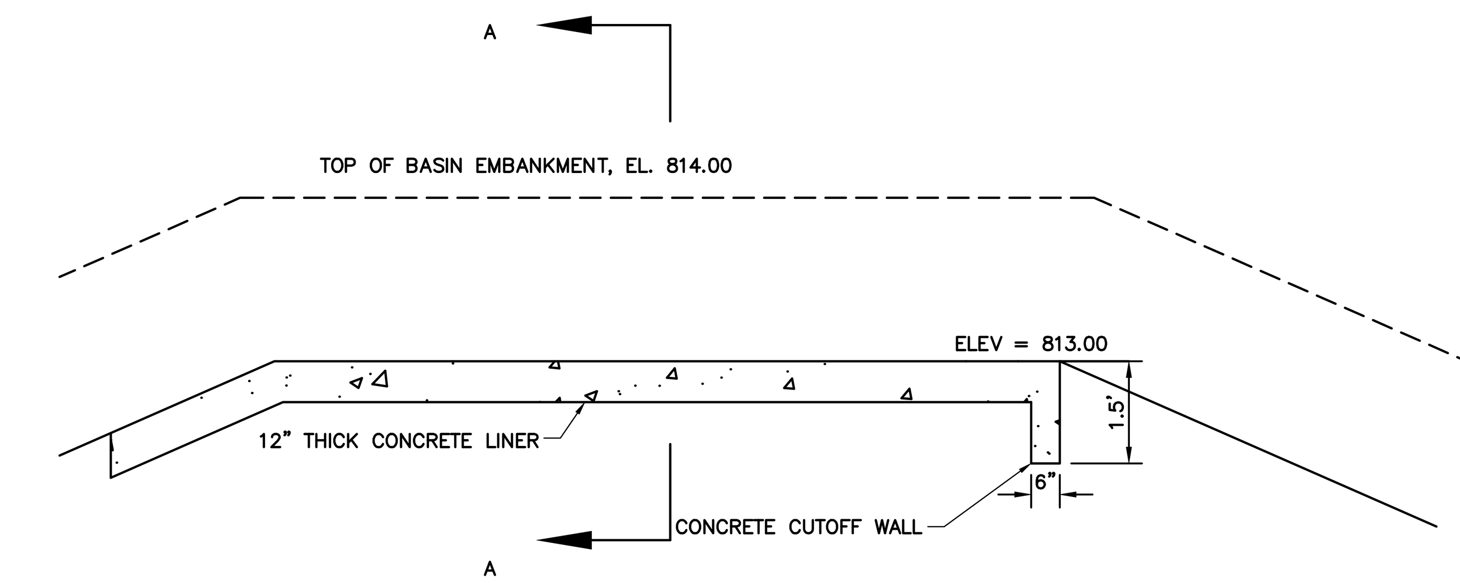


PARTIAL ISOMETRIC

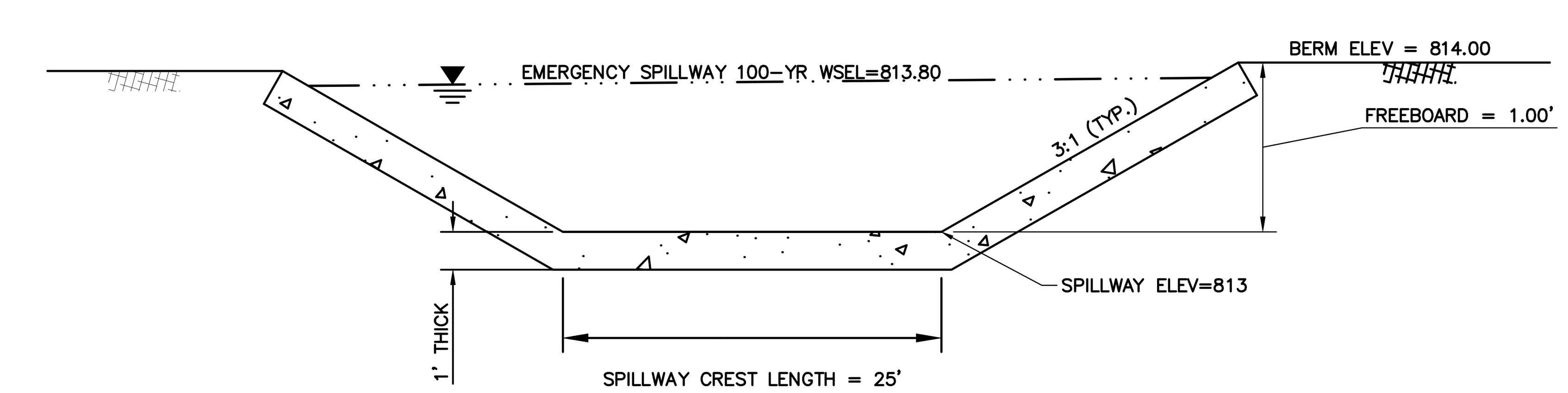
NOTES:

1. THE FILTER MATERIAL SHALL BE PLACED IN 6 INCH LIFTS AND COMPACTED WITH ONE PASS OF A PLATE VIBRATOR.
2. FILTER DIAPHRAGM SHALL BE LOCATED DOWNSTREAM FROM EMBANKMENT CENTERLINE A MAXIMUM DISTANCE AS POSSIBLE TO ACHIEVE A MINIMUM COVER OF 2 FEET.

DETAIL 14
NOT USED
N.T.S

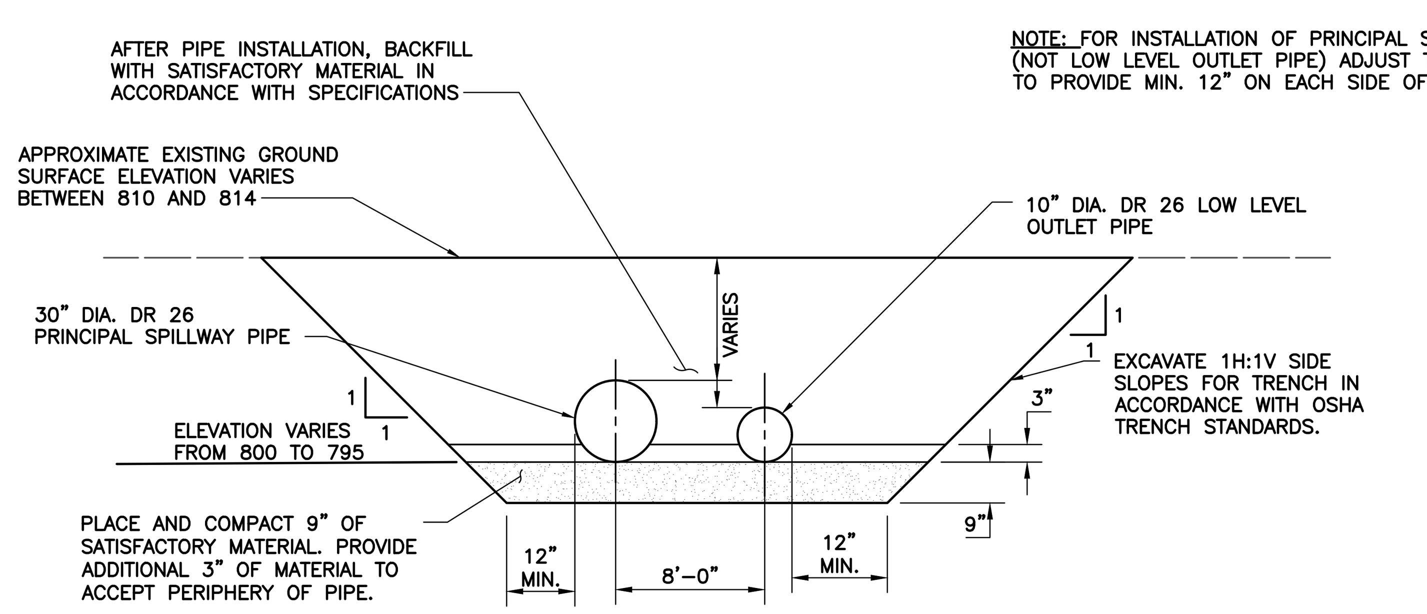


SPILLWAY



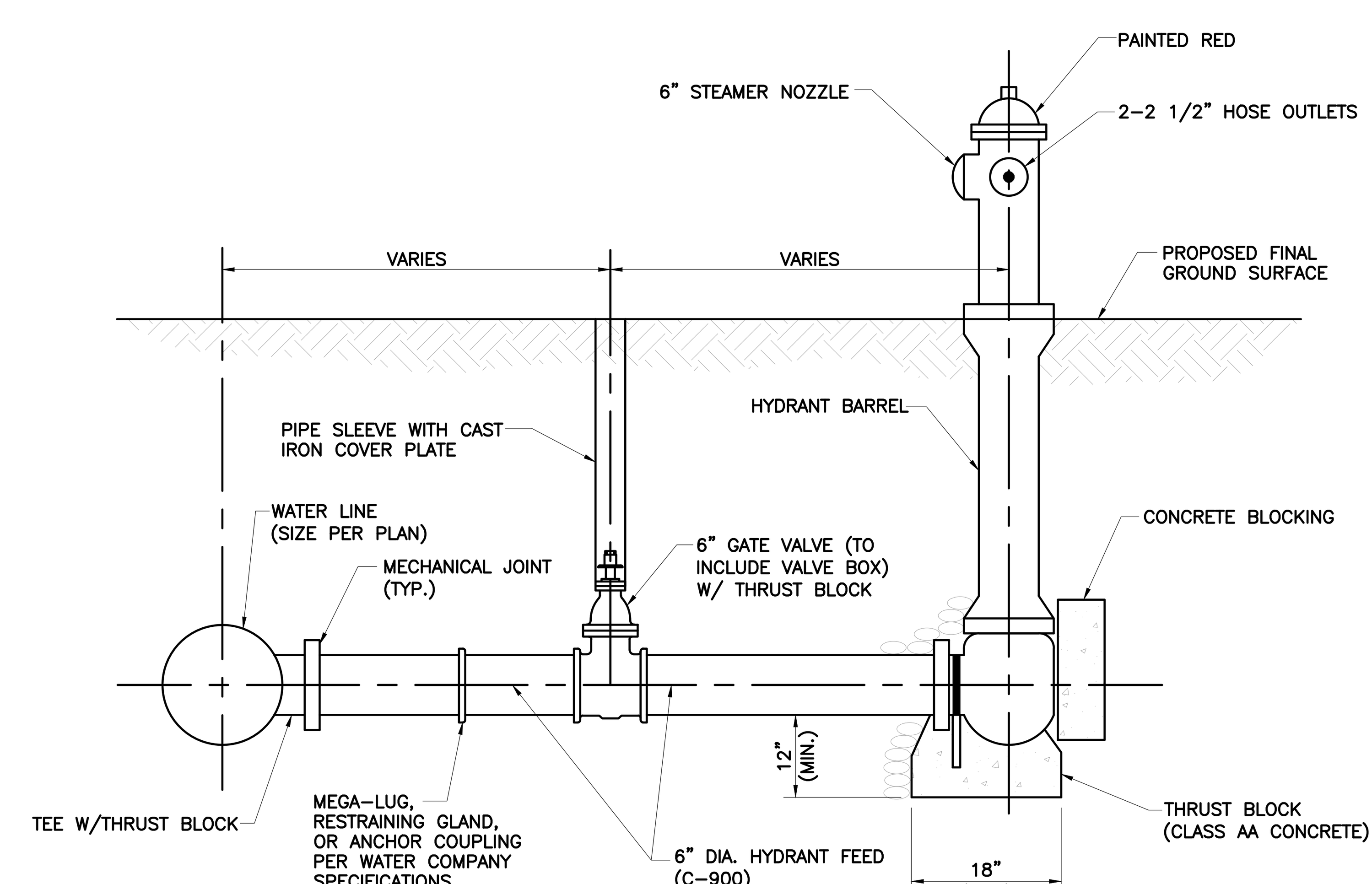
SECTION A-A

DETAIL 16
LAKE EMERGENCY SPILLWAY
N.T.S.



NOTE: FOR INSTALLATION OF PRINCIPAL SPILLWAY PIPE (NOT LOW LEVEL OUTLET PIPE) ADJUST TRENCH WIDTH TO PROVIDE MIN. 12" ON EACH SIDE OF PIPE

DETAIL 13
PRINCIPAL SPILLWAY PIPE AND LOW LEVEL OUTLET PIPE TRENCH
N.T.S



NOTES:

1. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE MUNICIPAL AUTHORITY AND PETERS TOWNSHIP FIRE DEPARTMENT REQUIREMENTS AND SPECIFICATIONS OF PA AMERICAN WATER COMPANY.
2. ALL FITTINGS, VALVES, AND HYDRANTS SHALL BE POLYETHYLENE WRAPPED.
3. FIRE HYDRANT TO MEET TOWNSHIP REQUIREMENT OF 6" FULL FLOW.

DETAIL 15
TYPICAL FIRE HYDRANT INSTALLATION
N.T.S

REVISION RECORD

NO	DATE	DESCRIPTION

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PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

SITE CONSTRUCTION DETAILS

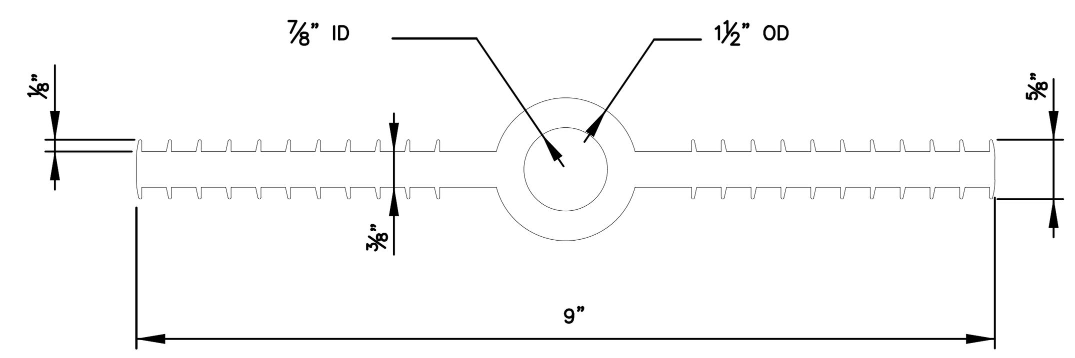
DRAWING NO.: **C802**

GENERAL NOTES

1. ALL ELEVATIONS AND COORDINATES ARE BASED VERTICAL AND HORIZONTAL DATUM INFORMATION PROVIDED ON SHEET G101.
2. ALL STATIONS AND ELEVATIONS ARE IN FEET, UNLESS NOTED OTHERWISE.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW ALL APPLICABLE SAFETY CODES, REGULATIONS, AND ORDINANCES DURING ALL PHASES OF CONSTRUCTION.
4. THE STRUCTURES ARE DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER CONSTRUCTION IS COMPLETED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURES IN A SAFE AND STABLE CONDITION DURING CONSTRUCTION, INCLUDING PROVIDING TEMPORARY BRACING, TIE-DOWNS, PROTECTION AGAINST DAMAGE OR OTHER ITEMS THAT MAY BE NECESSARY.

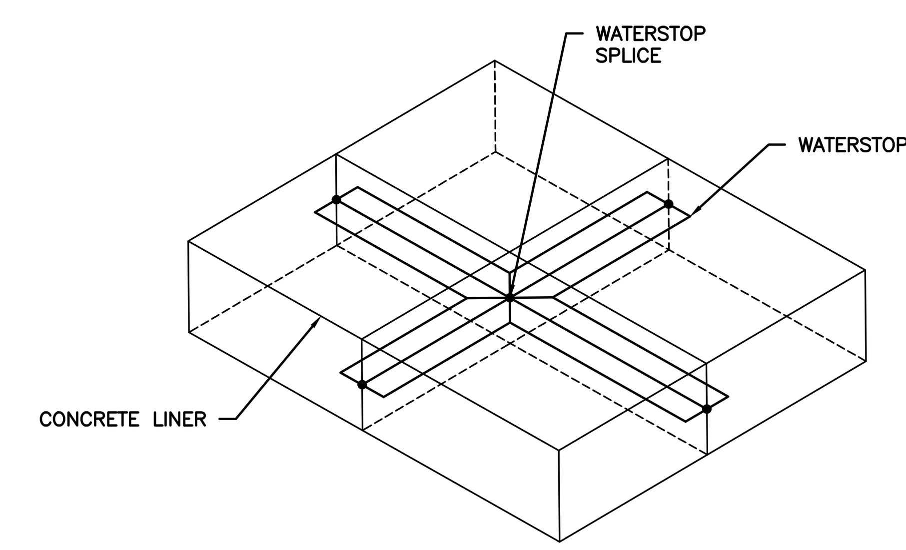
CONCRETE AND REINFORCEMENT

1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, UNLESS NOTED OTHERWISE.
2. STRUCTURAL CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE SPECIFICATIONS AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, f'c = 5,000 PSI AT 28 DAYS.
3. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWINGS.
4. FORMED AND UNFORMED CONCRETE SURFACE FINISHES SHALL BE AS NOTED IN THE SPECIFICATIONS.
5. PREPARE CONCRETE SURFACES AGAINST WHICH ADDITIONAL CONCRETE IS TO BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS. HORIZONTAL CONSTRUCTION JOINTS SHALL BE ROUGHENED TO A MINIMUM AMPLITUDE OF 1/4", EXPOSING CLEAN, SOUND AGGREGATE. SURFACE OF CONSTRUCTION JOINTS SHALL BE CLEANED AND LAITANCE REMOVED.
6. ALL EXPOSED EDGES SHALL BE FORMED WITH A 3/4 INCH CHAMFER, UNLESS OTHERWISE NOTED.
7. PROVIDE CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS, UNLESS OTHERWISE NOTED:
   A. UNFORMED CONCRETE PLACED AGAINST EARTH 4"
   B. SURFACES TO BE IN CONTACT WITH EARTH OR WATER:
      • LESS THAN OR EQUAL TO 2 FT THICK 3"
      • GREATER THAN 2 FT THICK 4"
   C. SURFACES SUBJECT TO ABRASION BY FLOWING WATER 6"
   D. OTHER LOCATIONS, UNO 2"
8. PROVIDE EMBEDMENT OF CONCRETE REINFORCEMENT AND CLASS B LAP SPLICES IN ACCORDANCE WITH TABLE 1 ON THIS SHEET, UNLESS NOTED OTHERWISE.
9. WHEN BARS OF DIFFERENT SIZES ARE SPLICED, THE SPLICE LENGTH SHALL BE BASED ON THE LARGER OF THE EMBEDMENT LENGTH OF THE LARGER BAR OR THE TENSION LAP SPLICE LENGTH OF THE SMALLER BAR.
10. REINFORCEMENT SPLICES MAY BE REQUIRED THAT ARE NOT SHOWN ON THESE PLANS. SPLICE LOCATIONS AND LENGTHS SHALL BE CLEARLY SHOWN ON THE REINFORCING STEEL SHOP DRAWINGS FOR APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE.
11. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE CONSTRUCTION IS FULLY COMPLETED. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, ETC. THAT MAY BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.
12. ADDITIONAL CONSTRUCTION JOINTS (HORIZONTAL AND VERTICAL) SHALL BE SUBMITTED WITH SHOP DRAWINGS FOR APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE. ALL CONSTRUCTION JOINTS SHALL HAVE WATERSTOPS, UNLESS NOTED OTHERWISE.
13. ALL REINFORCEMENT SHALL BE DISCONTINUED AT EXPANSION JOINTS, UNLESS NOTED OTHERWISE.
14. SUBJECT TO APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE, BARS MAY BE SHIFTED SLIGHTLY TO AVOID EMBEDDED ITEMS AND OTHER OBSTRUCTIONS.
15. REINFORCING BARS: ASTM A615, GRADE 60.
16. BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW.
17. ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 CURRENT EDITIONS).
18. REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR SUPPORTS MUST BE CLEARLY DETAILED.
19. HOOKS AND BENDS SHALL BE ACI STANDARD UNLESS OTHERWISE INDICATED.
20. CONTINUOUS REINFORCING BARS SHALL BE PROVIDED WITH TENSION LAPS AT ALL SPLICES, UNLESS NOTED OTHER WISE NOTED. ALL STEEL REINFORCING LAPS SHALL BE TENSION B LAPS TYPICAL, UNLESS NOTED OTHERWISE.
21. MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
22. REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
23. REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
24. WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
25. ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE.
26. NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
27. WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS (A325, A490) WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.

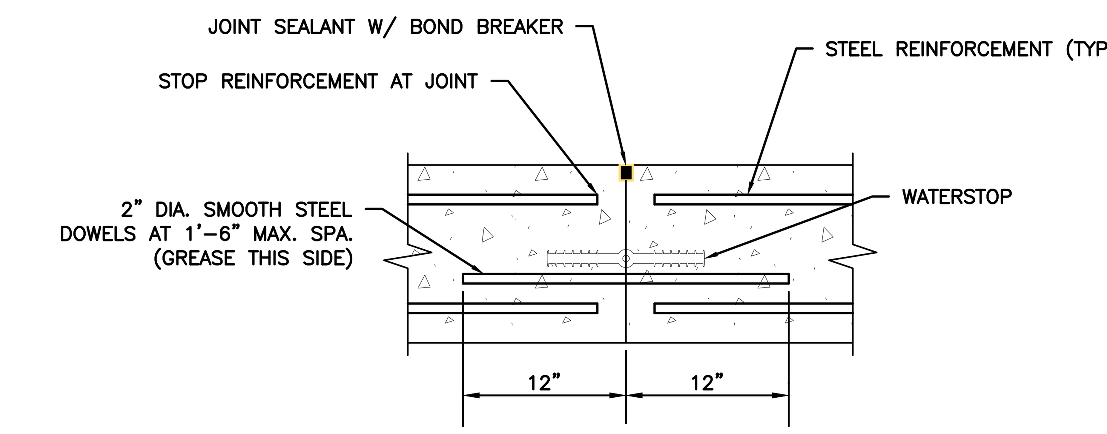


TYPICAL WATERSTOP DETAIL
N.T.S

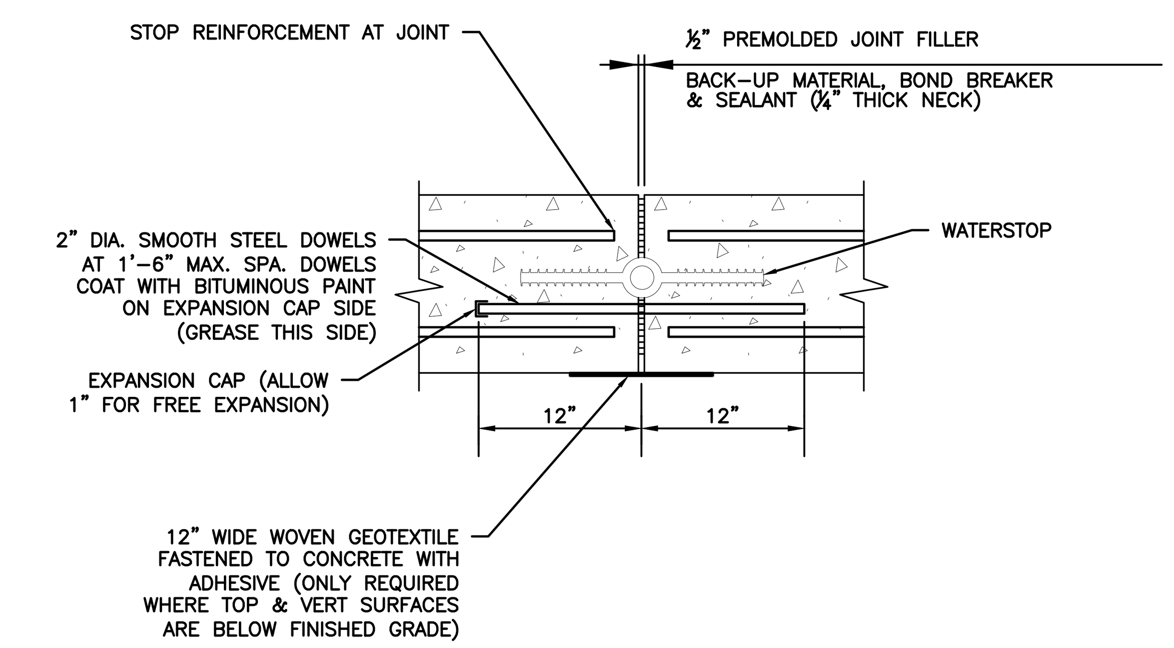
NOTES (FOR WATERSTOPS):
1. USE 9-INCH WATERSTOP AT ALL JOINTS.
2. AT LOCATIONS WHERE WATERSTOPS JOIN AT TWO DIFFERENT ANGLES OR WHERE DIFFERENT SIZE WATERSTOPS MEET OR JOIN, THE USE OF SPLIT OR WELDED SPLICE WATERSTOPS WILL BE PROHIBITED.



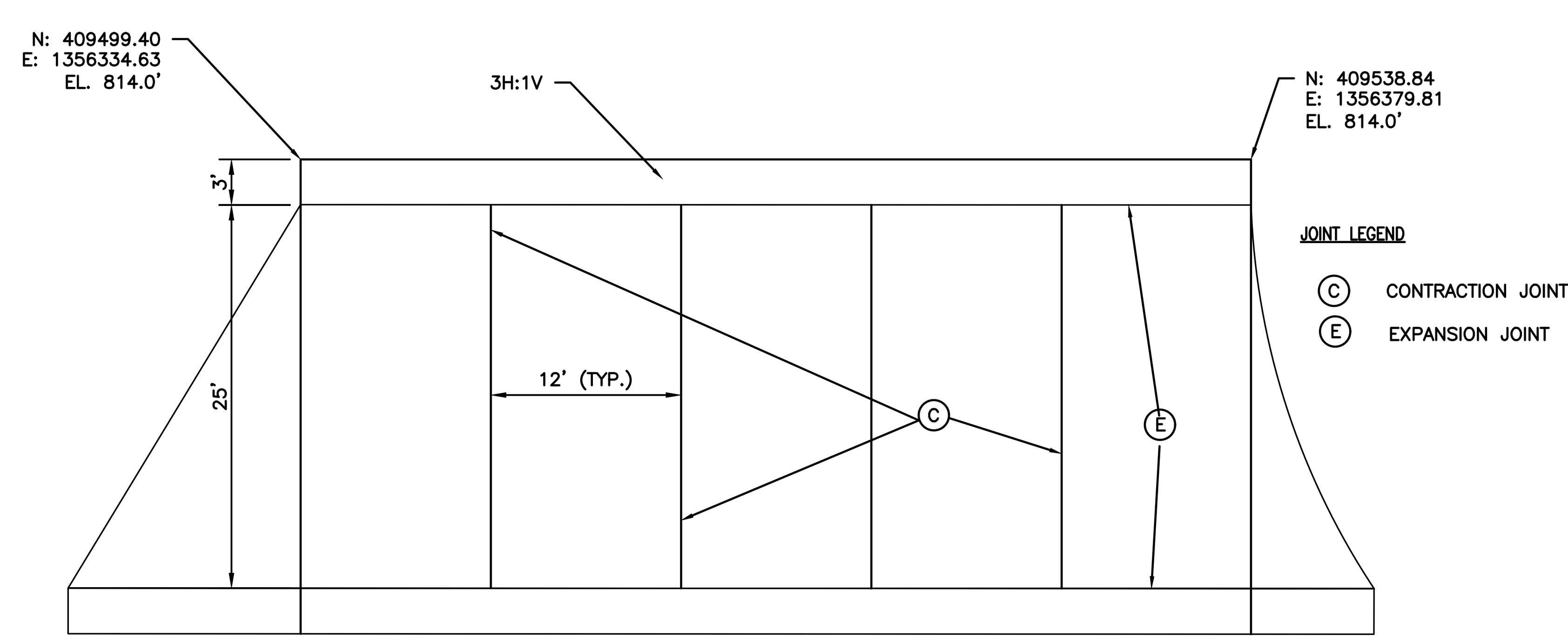
ISOMETRIC WATERSTOP DETAIL
N.T.S



CONTRACTION JOINT DETAIL - TYPE C JOINT
N.T.S



EXPANSION JOINT DETAIL - TYPE E JOINT
N.T.S



EMERGENCY SPILLWAY PLAN
N.T.S

TABLE 1

BAR EMBEDMENT LENGTH AND LAP SPLICE LENGTH

f'c=4,500psi	fy=60,000psi			
BAR SIZE	EMBEDMENT LENGTH		SPLICE LENGTH – CLASS B	
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS
#3	1'-0"	1'-0"	1'-2"	1'-0"
#4	1'-2"	1'-0"	1'-7"	1'-2"
#5	1'-6"	1'-2"	1'-11"	1'-6"
#6	1'-9"	1'-5"	2'-4"	1'-9"
#7	2'-7"	2'-0"	3'-4"	2'-7"
#8	2'-11"	2'-3"	3'-10"	2'-11"

NOTES FOR TABLE 1:
1. TOP BARS ARE DEFINED AS HORIZONTAL BARS (AND BARS INCLINED LESS THAN 45 DEGREES TO THE HORIZONTAL) SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER DIRECTLY BELOW THE BARS.
2. VALUES IN TABLE 1 ARE FOR UNCOATED REINFORCEMENT.
3. FOR CLASS A SPLICES, USE THE EMBEDMENT LENGTH.

REVISION RECORD		
NO	DATE	DESCRIPTION

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333 Baldwin Road · Pittsburgh, PA 15205
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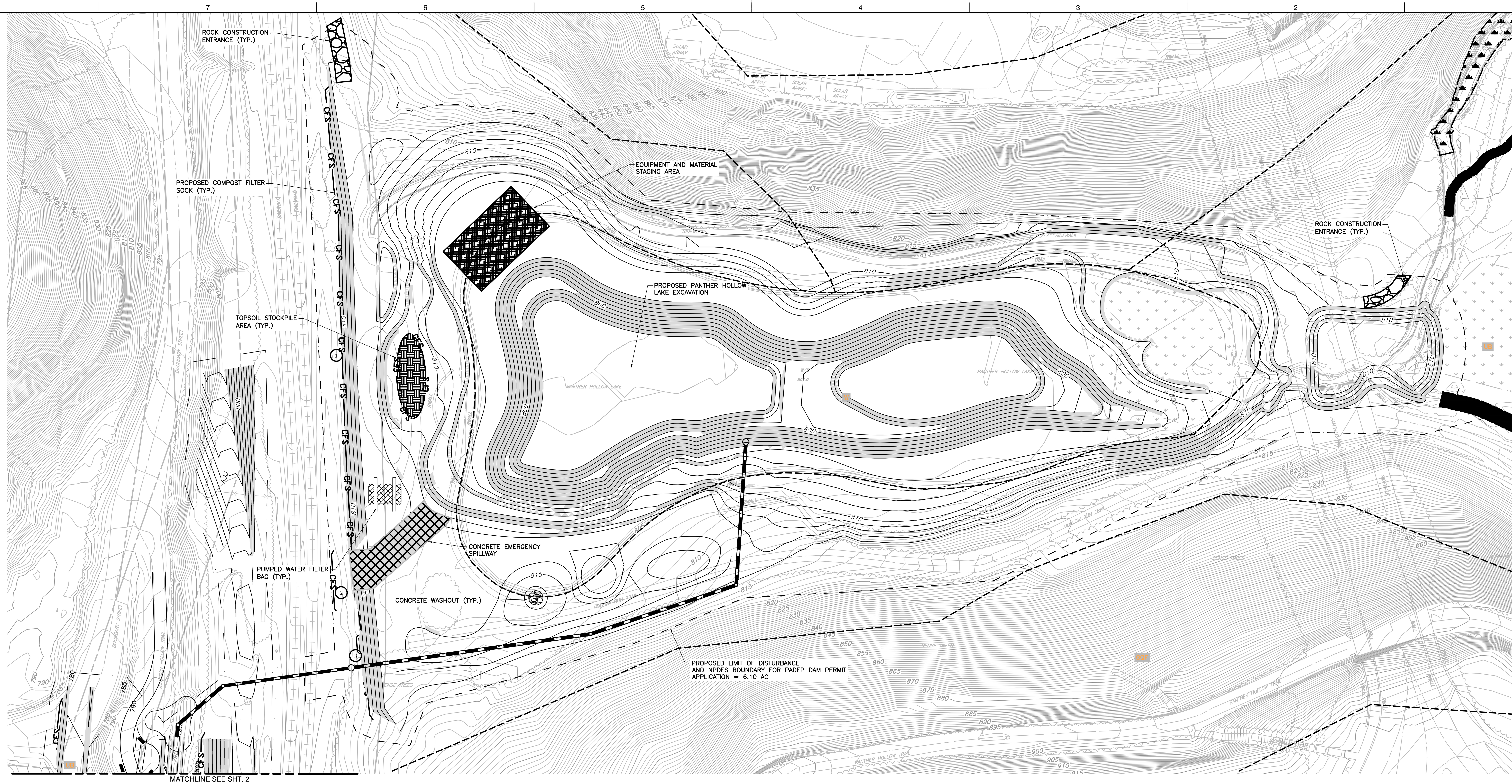
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: PJS
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

SITE CONSTRUCTION DETAILS

DRAWING NO.: C803

P:\2017\174-960\-CADD\Dwg\CV02 – Dam Permit\174960-CV01-C800.dwg[C803] LS:(10/21/2019 – crossa) – LP: 10/21/2019 5:08 PM



LEGEND

(1)	COMPOST FILTER SOCK NUMBER, REFER TO C5-301 FOR SCHEDULE		DUST COVERS		EROSION CONTROL BLANKET
CFS	COMPOST FILTER SOCK	IFM	INLET FILTER MAT		ROCK CONSTRUCTION ENTRANCE
	LIMIT OF DISTURBANCE		CONCRETE WASHOUT		MATERIAL AND EQUIPMENT STAGING AREA
	ROCK CONSTRUCTION ENTRANCE		PUMPED WATER FILTER BAG		SOIL STOCKPILE AREA
	SOIL DELINEATION	GQF	SOIL TYPE		

811

Pennsylvania One Call System, Inc.
Call 3 Business Days Before You Dig!
1-800-242-1776 or 8-1-1
POCS Serial NO. :_______________
Date:_______________

CONTRACTORS ARE REQUIRED TO NOTIFY THE FACILITY OWNERS NOT LESS THAN THREE (3) NOT MORE THAN TEN (10) WORKING DAYS PRIOR TO EXCAVATION OR DEMOLITION WORK WHEN USING POWERED EQUIPMENT ON PUBLIC OR PRIVATE PROPERTY ANYWHERE IN THE COMMONWEALTH. CONTRACTORS ARE RESPONSIBLE FOR PRESERVING THE FACILITY OWNER MARKINGS, TO EXERCISE DUE CARE AND EMPLOY PRUDENT TECHNIQUES WITHIN THE TOLERANCE ZONE. CONTRACTORS SHOULD KEEP EACH OPERATOR AT THE SITE INFORMED AND EVALUATE THE PREMISES IF NECESSARY. NOTIFICATION SHOULD BE MADE THROUGH THE PENNSYLVANIA ONE-CALL SYSTEM (1-800-242-1776 or 8-1-1).

SYMBOL	SOIL TYPE
URB	URBAN LAND-RAINSBORO COMPLEX, GENTLY SLOPING, HYDROLOGIC SOIL GROUP C
UB	URBAN LAND
GQF	GILPIN-UPSHUR COMPLEX, VERY STEEP, HYDROLOGIC SOIL GROUP C

OFF-SITE RECEIVING WATERS OF THE COMMONWEALTH

UNT TO MONONGAHELA RIVER ID: 134839843 - WARM WATER FISHES (WWF)

WATERSHED: LOWER MONONGAHELA

REFERENCE: PA eMap

SOCK NO.	DIAMETER (IN.)	SLOPE (%)	SLOPE LENGTH ABOVE BARRIER (FT.)
1	18	33	12
2	18	7	93
3	18	33	12

REFERENCE: PADEP E&S MANUAL STANDARD E&S WORKSHEET NO. 1

DRAFT

SCALE: 1" = 40'

PRELIMINARY NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

SciTek CONSULTANTS, INC.
1880 JOHN F. KENNEDY BLVD., SUITE 600
PHILADELPHIA, PA 19103
PHONE: (267) 341-5385 FAX: (267)519-0273
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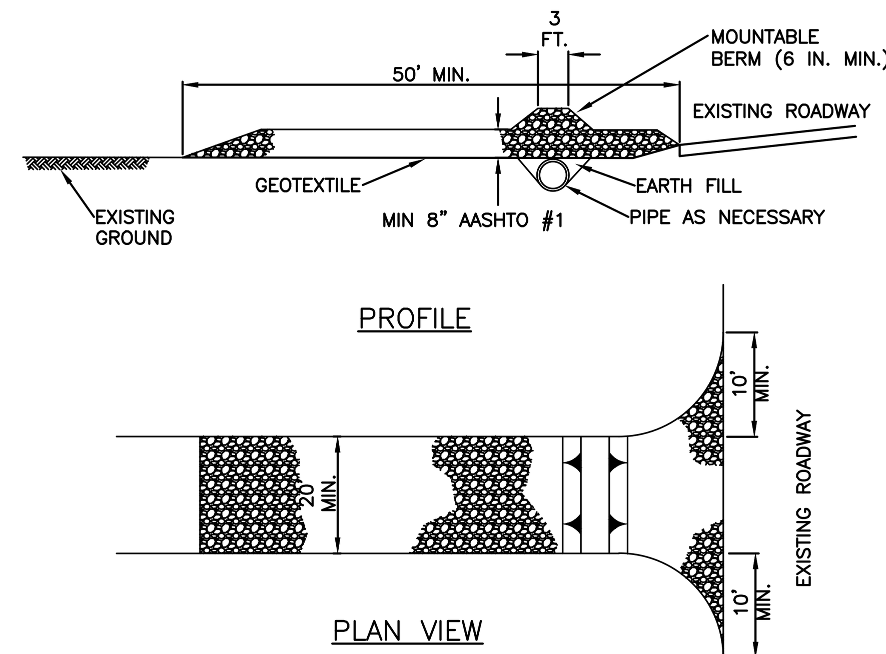
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	LJK/KPK	CHECKED BY:	KPK	APPROVED BY:	KPK
DATE:	OCTOBER 2019	DWG SCALE:		PROJECT NO:	18-840

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: **C900**



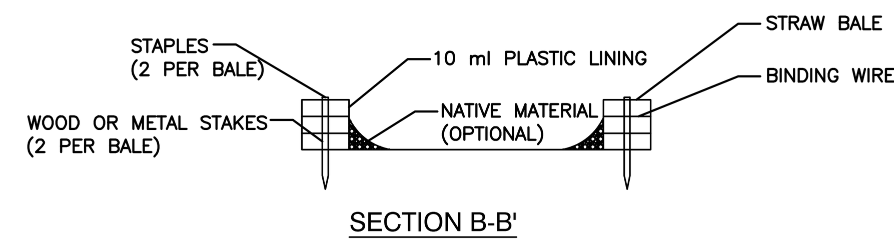
* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE

NOTES:

1. REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.
2. RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.
3. MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.
4. MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

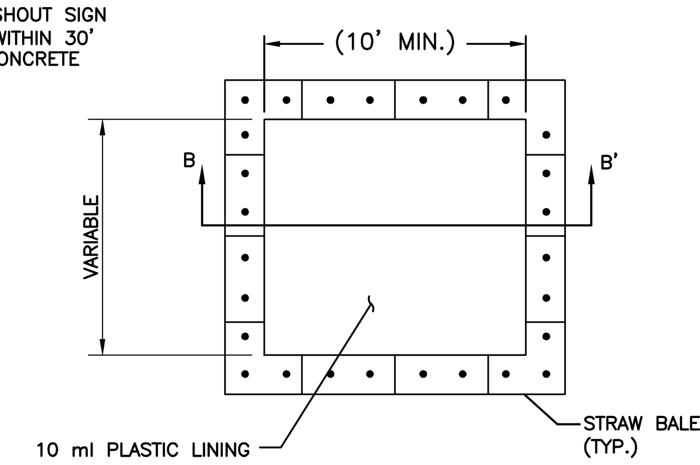
DETAIL 901
PADEP STANDARD CONSTRUCTION DETAIL #3-1
ROCK CONSTRUCTION ENTRANCE

NOT TO SCALE

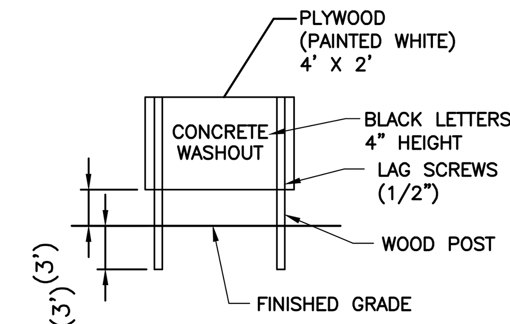


NOTES:

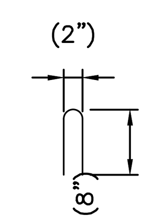
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



PLAN
TYPE "ABOVE GRADE" WITH STRAW BALES



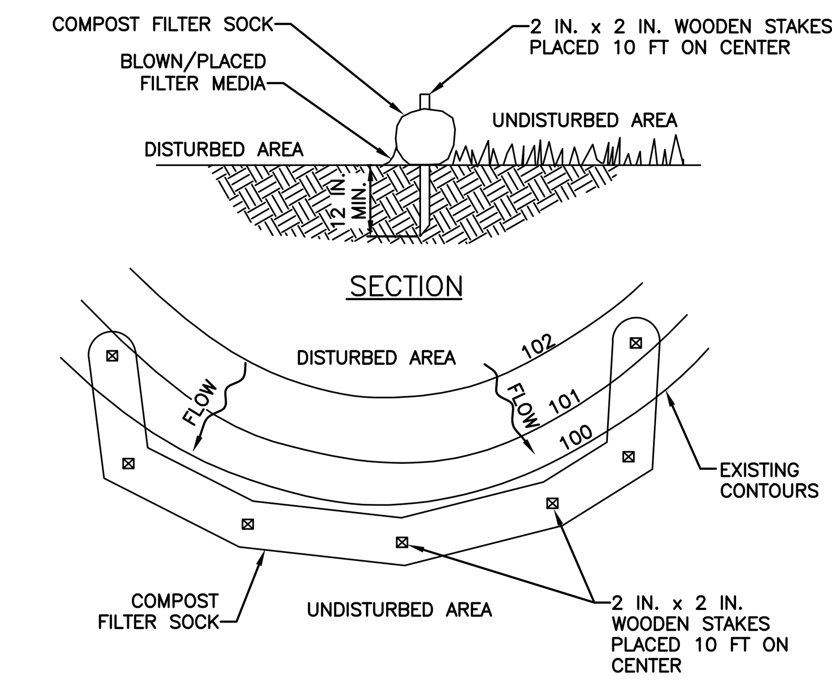
CONCRETE WASHOUT SIGN DETAIL (OR EQUIVALENT)



STAPLE DETAIL

DETAIL 902
TEMPORARY CONCRETE WASHOUT FACILITY

NOT TO SCALE



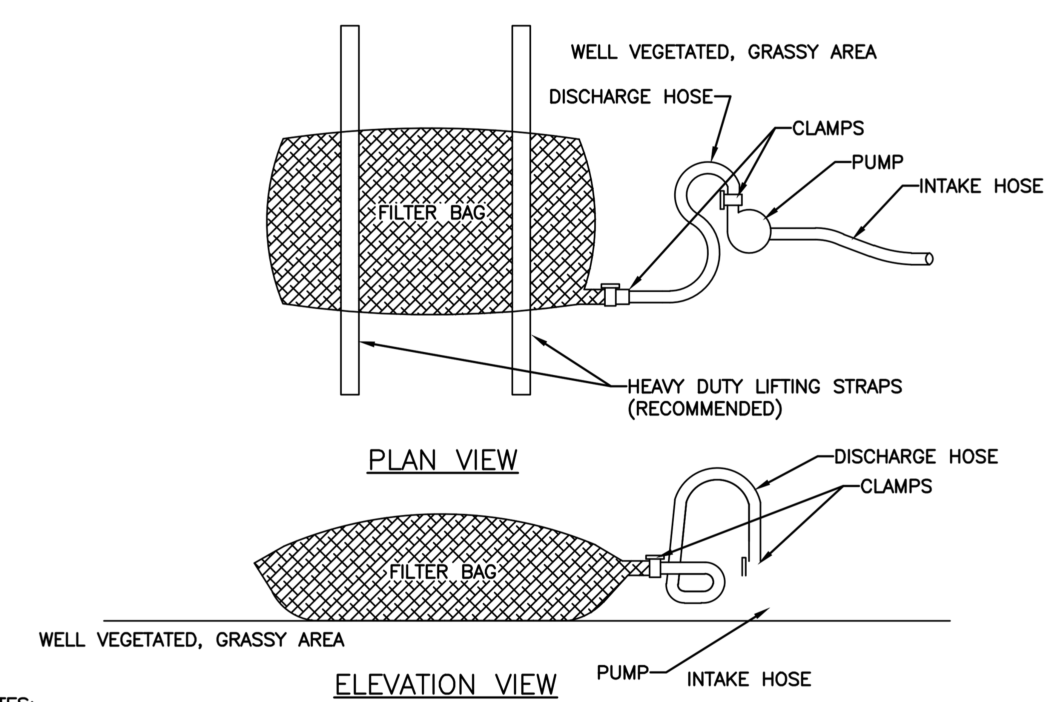
NOTES:

1. SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

SOCK ID	SOCK SIZE
1	18"
2	18"
3	18"

DETAIL 903
PADEP STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK

NOT TO SCALE



NOTES:

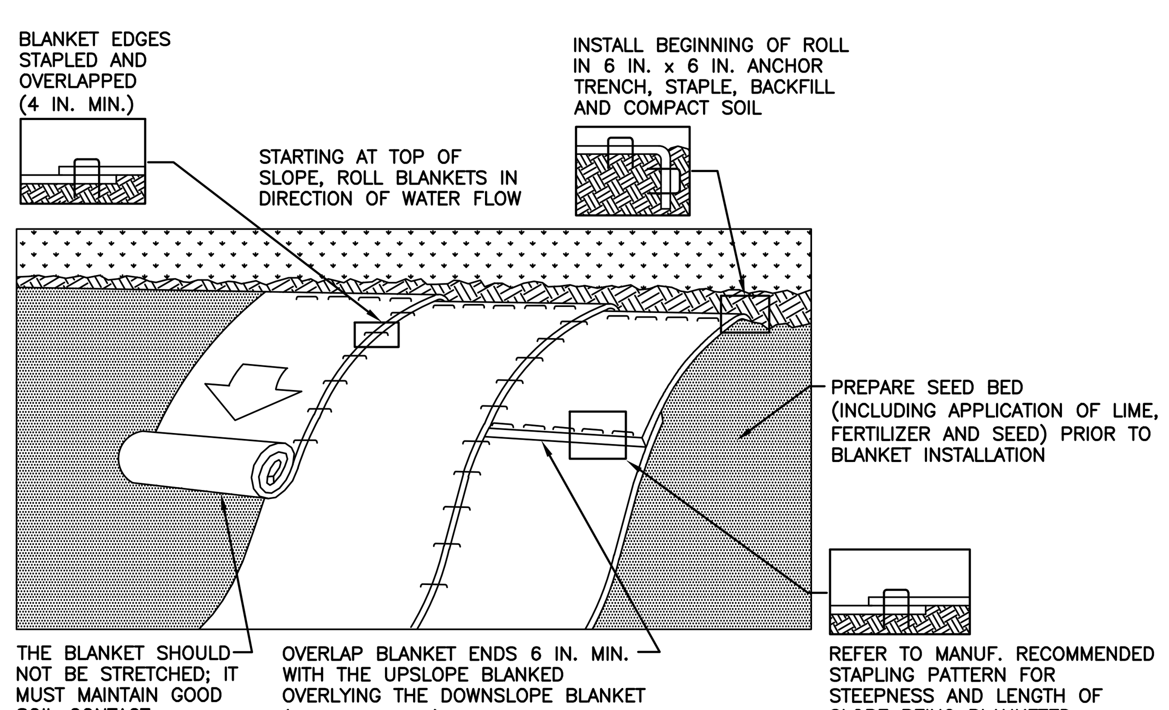
1. LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON–WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D–4884	60 LB/IN
GRAB TENSILE	ASTM D–4632	205 LB
PUNCTURE	ASTM D–4833	110 LB
MULLEN BURST	ASTM D–3786	350 PSI
UV RESISTANCE	ASTM D–4355	70%
AOS % RETAINED	ASTM D–4751	80 SIEVE

2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
3. BAGS SHALL BE LOCATED IN WELL–VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON–ERODIBLE AND NON–POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
4. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
6. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
7. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

DETAIL 905
STANDARD CONSTRUCTION DETAIL #3-16
PUMPED WATER FILTER BAG

NOT TO SCALE



NOTES:

1. SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.
2. PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.
4. BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.
5. THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
6. BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.

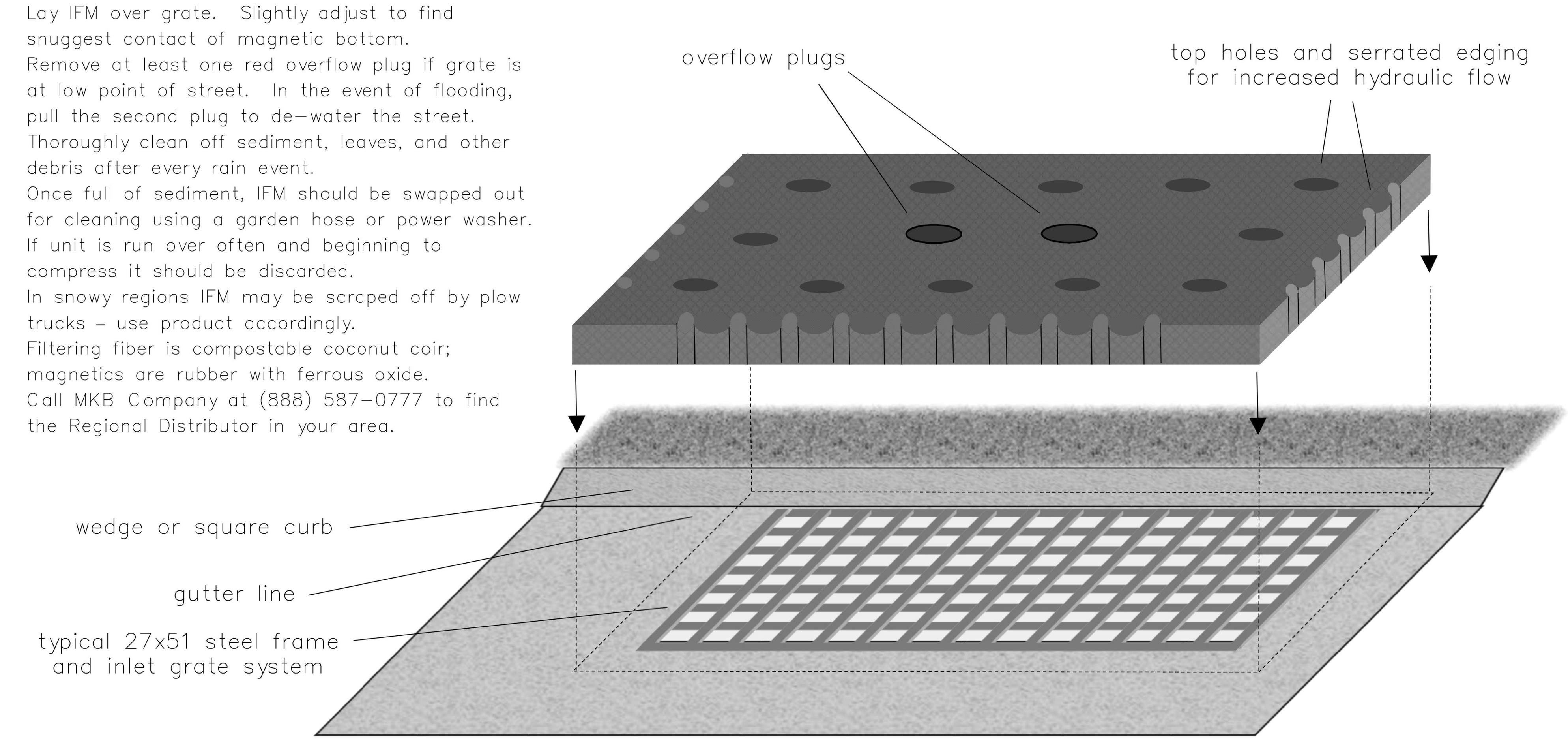
DETAIL 904
PADEP STANDARD CONSTRUCTION DETAIL #11-1
EROSION CONTROL BLANKET INSTALLATION

NOT TO SCALE

INSTRUCTIONS

1. Before covering, make sure grate and surrounding area are free of any debris or grit so magnetic bottom can fully contact grate.
2. Lay IFM over grate. Slightly adjust to find snuggest contact of magnetic bottom.
3. Remove at least one red overflow plug if grate is at low point of street. In the event of flooding, pull the second plug to de-water the street.
4. Thoroughly clean off sediment, leaves, and other debris after every rain event.
5. Once full of sediment, IFM should be swapped out for cleaning using a garden hose or power washer.
6. If unit is run over often and beginning to compress it should be discarded.
7. In snowy regions IFM may be scraped off by plow trucks – use product accordingly.
8. Filtering fiber is compostable coconut coir; magnetics are rubber with ferrous oxide.
9. Call MKB Company at (888) 587–0777 to find the Regional Distributor in your area.

DIAMOND SOCK INLET FILTER MAT
(TYPE–M 2x4 INLET)



DETAIL 906
INLET FILTER MAT

NOT TO SCALE

DRAFT

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

SciTek Consultants, Inc.
1880 JOHN F. KENNEDY BLVD., SUITE 600
PHILADELPHIA, PA 19103
PHONE: (267) 341-5385 FAX: (267)519-0273
www.scitekanswers.com

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
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www.cecinc.com

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: LJK/KPK	CHECKED BY: KPK	APPROVED BY: KPK
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 18-840

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: C901

GENERAL EROSION CONTROL NOTES

1. THE LOCATION OF EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ARE APPROXIMATE AND THOSE SHOWN ARE NOT NECESSARILY ALL THE EXISTING UTILITIES AND STRUCTURES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXACT LOCATION OF ALL ABOVE AND BELOW GROUND UTILITIES AND STRUCTURES PRIOR TO INITIATING CONSTRUCTION ACTIVITIES.

2. THE CONTRACTOR SHALL CONTACT PENNSYLVANIA ONE CALL SYSTEM INC. AT (412) 242–1776 AND THE APPROPRIATE UTILITY COMPANIES AT LEAST THREE (3) DAYS PRIOR TO THE INITIATION OF EARTHMOVING AND DEMOLITION ACTIVITIES.

3. BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE ALLEGHENY COUNTY CONSERVATION DISTRICT (ACCD). THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL PREPARED BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP), BUREAU OF SOIL AND WATER CONSERVATION, LATEST EDITION.

5. ADDITIONAL EROSION AND SEDIMENTATION CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY THE ACCD, OWNER OR TOWNSHIP IN THE EVENT ANY UNFORESEEN PROBLEMS ARISE DURING CONSTRUCTION.

6. THE CONTRACTOR SHALL INSTALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES PRIOR TO ANY SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE AND MAINTAIN THEM UNTIL PERMANENT STABILIZATION IS ESTABLISHED.

7. THE AGGREGATE BASE COURSE SHALL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS IN ORDER TO STABILIZE PARKING AREAS.

8. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES TO BE REMOVED, RELOCATED AND/OR RAZED ARE DISCONNECTED PRIOR TO INITIATING EARTHMOVING ACTIVITIES.

9. THE CONTRACTOR SHALL LANDSCAPE OR VEGETATE DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN 4 DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC. IF THE SEASON PREVENTS THE ESTABLISHMENT OF A TEMPORARY COVER, STRAW MULCH SHALL BE APPLIED AT A RATE OF THREE (3) TONS PER ACRE OVERTOP EXPOSED AREAS.

10. CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF AT AN APPROVED WASTE SITE. BURNING SHALL NOT BE PERMITTED.

11. AT THE TIME WHEN THE SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED BY THE CONTRACTOR TO MAKE IT SUITABLE TO SUPPORT VEGETATIVE GROUND COVER.

12. THE CONTRACTOR SHALL VEGETATE ALL EXPOSED AREAS THAT WILL NOT BE LANDSCAPED WITHIN FOUR (4) DAYS AFTER FINAL GRADING.

13. THE CONTRACTOR SHALL CONTROL DUST WITH WATER OR OTHER METHODS APPROVED BY THE LOCAL SOIL CONSERVATION DISTRICT AND THE OWNER.

14. THE CONTRACTOR SHALL INSTALL COMPOST FILTER SOCKS ALONG THE PERIMETER OF ALL SOIL STOCKPILES.

15. THE CONTRACTOR SHALL INSTALL EROSION CONTROL BLANKETS OVERTOP OF 3:1 (HORIZONTAL: VERTICAL) OR STEEPER SLOPES. EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN S150BN OR APPROVED EQUAL.

16. THE CONTRACTOR SHALL SUBMIT A PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLAN TO THE OWNER PRIOR TO CONSTRUCTION IF CHEMICALS, SOLVENTS OR OTHER HAZARDOUS WASTES OR MATERIALS WITH THE POTENTIAL TO CAUSE ACCIDENTAL POLLUTION DURING EARTHMOVING OR OTHER CONSTRUCTION ACTIVITIES ARE STORED OR USED ON SITE. THE PPC PLAN SHALL BE PREPARED IN ACCORDANCE WITH "GUIDELINES FOR THE DEVELOPMENT AND IMPLEMENTATION OF PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLANS", PREPARED BY PADEP BUREAU OF SOLID WASTE MANAGEMENT AND PADEP BUREAU OF WATER QUALITY MANAGEMENT.

17. THE CONTRACTOR SHALL CONSTRUCT A BERM AROUND AREAS WHERE HYDRAULIC FLUID AND DIESEL FUEL WILL BE STORED DURING CONSTRUCTION TO SERVE AS A CONTAINMENT AREA FOR THE CONTROL OF POSSIBLE SPILLS. ANY SPILL WITHIN THE CONTAINMENT AREA SHALL BE IMMEDIATELY CLEANED. TELEPHONE NUMBERS OF EMERGENCY RESPONSE TEAMS ARE TO BE KEPT ON SITE, AND THEY ARE TO BE NOTIFIED IN THE CASE OF A SPILL.

18. THE CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION.

19. THE CONTRACTOR SHALL PROVIDE THE LOCATION AND ANY APPLICABLE PERMIT NUMBERS OF ALL THE OFF SITE DISPOSAL AND BORROW SITES THAT WILL BE UTILIZED DURING CONSTRUCTION TO THE ACCD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ALSO IDENTIFY THE EROSION AND SEDIMENTATION CONTROL MEASURES, WHICH WILL BE IMPLEMENTED AT THE DISPOSAL AND/OR BORROW SITES. IF THE DISPOSAL AND/OR BORROW SITES ARE UNPERMITTED, AN EROSION AND SEDIMENTATION PLAN MUST BE APPROVED BY THE ACCD PRIOR TO THEIR USE.

20. RUNOFF DRAINS INTO DOWNSTREAM TO JUNCTION HOLLOW.

21. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL SITE INSPECTIONS WILL BE DOCUMENTED IN AN INSPECTION LOG KEPT FOR THIS PURPOSE. THE COMPLIANCE ACTIONS AND THE DATE, TIME AND NAME OF THE PERSON CONDUCTING THE INSPECTION. THE INSPECTION LOG WILL BE KEPT ONSITE AT ALL TIMES AND MADE AVAILABLE TO THE ACCD UPON REQUEST.

22. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING, MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENTATION BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS OR MODIFICATIONS OF THOSE INSTALLED WILL BE NEEDED.

23. WHERE BMPS ARE FOUND TO FAIL TO ALLEVIATE EROSION OR SEDIMENT POLLUTION, THE PERMITTEE OR CO–PERMITTEE SHALL INCLUDE THE FOLLOWING INFORMATION:
   A. THE LOCATION AND SEVERITY OF THE BMP'S FAILURE AND ANY POLLUTION EVENTS.
   B. ALL STEPS TAKEN TO REDUCE, ELIMINATE AND PREVENT THE RECURRENCE OF THE NON–COMPLIANCE.
   C. THE TIME FRAME TO CORRECT THE NON–COMPLIANCE, INCLUDING THE EXACT DATES WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE.

24. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.

25. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS OF THE APPENDIX 64, EROSION CONTROL NOTES RULES AND REGULATIONS, TITLE 25, PART 1, DEPARTMENT OF ENVIRONMENTAL PROTECTION, SUBPART C, PROTECTION OF NATURAL RESOURCES, ARTICLE III, WATER RESOURCES, CHAPTER 102, EROSION CONTROL.

26. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE OPERATOR SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE ACCD, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF LOCATION.

27. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON–VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON–GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTRIBUTED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.

28. THE RESPONSIBILITY FOR PERFORMING ENVIRONMENTAL DUE DILIGENCE AND THE DETERMINATION OF CLEAN FILL RESIDES WITH THE OPERATOR.

29. PROCEDURES WHICH ENSURE THAT THE PROPER MEASURES FOR THE RECYCLING OR DISPOSAL OF MATERIALS ASSOCIATED WITH OR FROM THE PROJECT SITE WILL BE UNDERTAKEN IN ACCORDANCE WITH THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTIONS, TITLE 25, CHAPTER 102.4 #5 SECTION XI.

30. A LICENSED PROFESSIONAL OR THEIR DESIGNEE SHALL BE PRESENT ON THE PROJECT SITE DURING THE CONSTRUCTION OF ALL BMP's.

CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON–WATER SOLUBLE, NON–DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE–USE.)

CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP–1A AND FP–1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP–001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP–001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. A COPY OF FORM FP–001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.

ENVIRONMENTAL DUE DILIGENCE: INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE.

TEMPORARY CONTROL MEASURES

THE E&S CONTROL FACILITIES PROPOSED FOR THE PROPOSED PANTHER HOLLOW LAKE PROJECT ARE SHOWN ON THE E&S CONTROL PLAN. CONTROL MEASURES SHOWN ON THIS PLAN ARE MINIMUM CONTROLS TO REDUCE THE POTENTIAL FOR OFFSITE AREAS TO RECEIVE SEDIMENT–LADEN RUNOFF. ADDITIONAL CONTROLS MAY BE REQUIRED DEPENDING ON THE PROGRESS OF CONSTRUCTION AND VARYING CONDITIONS ENCOUNTERED.

1. ROCK CONSTRUCTION ENTRANCE

ROCK CONSTRUCTION ENTRANCES WILL BE PROVIDED AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.

INSTALLATION: TO CONSTRUCT THE PAD, PLACE A LAYER OF GEOTEXTILE AND AN INITIAL 2 TO 3 INCHES OF STONE ACROSS THE FULL WIDTH OF THE VEHICLE INGRESS AND EGRESS AREA. THE STONE PAD SHOULD BE AT LEAST 50 FEET IN LENGTH, 20 FEET IN WIDTH, AND 8 INCHES THICK. COMPLETE THE PLACEMENT OF STONE TO THE REQUIRED THICKNESS.

2. SILT SOCK

SILT SOCK SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED. VARIOUS FILTER SOCK SIZES SHALL BE INSTALLED, AS INDICATED, AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAILS PROVIDED.

INSTALLATION:
1. SILT SOCK SHALL BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER DISTURBED AREA, PERPENDICULAR TO SHEET FLOW.
2. STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE SILT SOCK ON 10 FT. CENTERS, USING 2–INCH BY 2–INCH BY 3–FOOT WOODEN STAKES.
3. STAKING DEPTH FOR SAND AND SILT LOAM SOILS SHALL BE 12–INCH, AND 8–INCH FOR CLAY SOILS.
4. LOOSE COMPOST MAY BE BACKFILLED ALONG THE UPSLOPE SIDE OF THE SILT SOCK, FILLING THE SEAM BETWEEN THE SOIL SURFACE AND THE DEVICE, IMPROVING FILTRATION AND SEDIMENT RETENTION.

MAINTENANCE:
1. SILT SOCKS SHOULD BE REGULARLY INSPECTED TO MAKE SURE THEY HOLD THEIR SHAPE AND ARE PRODUCING ADEQUATE FLOW THROUGH.
2. IF PONDING BECOMES EXCESSIVE, AND SEDIMENT REACHES THE TOP OF THE FILTER SOCK, ADDITIONAL FILTER SOCKS SHOULD BE ADDED IN THE AREAS WITHOUT DISTURBANCE OF SOIL OR COLLECTED SEDIMENT.

WHEN CONSTRUCTION IS COMPLETED ON SITE, THE SILT SOCKS MAY BE DISPERSED WITH A LOADER, RAKE, BULLDOZER OR OTHER DEVICE TO BE INCORPORATED IN THE SOIL OR LEFT ON TOP OF THE SOIL FOR FINAL SEEDING TO OCCUR. THE MESH NETTING MATERIAL SHALL BE COLLECTED AND DISPOSED OF IN A NORMAL TRASH CONTAINER OR REMOVED BY THE CONTRACTOR. IN CASES WHERE BIODEGRADABLE OR PHOTODEGRADABLE PRODUCTS ARE USED, THEY MAY BE LEFT ONSITE AT THE DIRECTION OF THE OWNER.

3. TEMPORARY VEGETATIVE STABILIZATION

IINSTALLATION: FERTILIZING, SEEDING, AND MULCHING WILL BE USED AS A TEMPORARY E&S CONTROL MEASURE ON ALL NON–PAVED DISTURBED AREAS. EXPOSED SOILS NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL NOT REMAIN UNSEEDED OR COVERED BY MULCH FOR MORE THAN 4 DAYS, INCLUDING STOCKPILED SOIL MATERIALS. WITH REGARD TO THE TEMPORARY SEED MIX, REFER TO THE SEEDING MIXTURE TABLE PROVIDED ON THE E&S CONTROL PLAN DETAIL SHEET.

WHERE SLOPES PERMIT, PROMPTLY DISK ALL AMENDMENTS UNDER A 3– TO 6–INCH DEPTH. WHERE SLOPES DO NOT PERMIT TILLAGE, TRACK SLOPE WITH A DOZER AS DESCRIBED UNDER SEEDBED PREPARATION. ON EXTREMELY STEEP SLOPES, AMENDMENTS MAY BE APPLIED WITH THE SEED AND MULCH USING A HYDROSEEDER AS LONG AS SEED AND INOCULANT IS NOT IN A SLURRY WITH FERTILIZERS FOR MORE THAN ONE HOUR.

PREPARE SEEDBED BY CULTIPACKING OR TRACKING WITH A DOZER USING EQUIPMENT (SUCH AS A LIGHT TRACTOR) AND TECHNIQUES THAT MINIMIZE RUTTING OF THE SURFACE. IF TRACKING IS DONE, RUN DOZER SO TRACK MARKS ARE PARALLEL TO SITE CONTOURS. IF A BRILLION SEEDER IS USED, THIS STEP MAY BE SKIPPED.

JUST BEFORE SEEDING, INOCULATE BIRDSFOOT TREFOIL SEED (WHERE APPLICABLE) WITH LEGUME INOCULANT APPROPRIATE FOR BIRDSFOOT TREFOIL USING AT LEAST FIVE TIMES THE MANUFACTURER'S MINIMUM INOCULANT APPLICATION RATES, THEN EVENLY APPLY THE APPROPRIATE SEED MIXTURE.

LIGHTLY CULTIPACK TO PRESS SEED INTO SEEDBED USING EQUIPMENT (SUCH AS A LIGHT TRACTOR) AND TECHNIQUE THAT MINIMIZES RUTTING OF THE SURFACE. IF A BRILLION SEEDER IS USED, THIS STEP MAY BE CONSIDERED COMPLETE. IF SLOPES ARE TOO STEEP TO PERMIT SEED PREPARATION AND PLACEMENT, USE HYDROSEEDING TECHNIQUES.

PROMPTLY AND EVENLY APPLY STRAW (NOT HAY) MULCH AT A RATE OF 3 TONS PER ACRE USING A BALE–BUSTER OR USING WOOD CELLULOSE FIBER (NOT PAPER PULP) HYDROMULCH AT A RATE OF 3,000 POUNDS PER ACRE. PROMPTLY TACK STRAW INTO PLACE USING ONE OF THE FOLLOWING METHODS: 1) APPLY "HYDRORAM" (LINEAR POLYACRILAMIDE POLYMER) DISTRIBUTED BY POLYMERS, INC. (WWW.WATERSORB.COM OR 501–623–9995) WITH WATER OVER STRAW AT A RATE OF 8 POUNDS PER ACRE; 2) APPLY 800 TO 1,000 POUNDS PER ACRE APPLICATION OF WOOD CELLULOSE FIBER MULCH WITH A HYDROSEEDER OVER THE STRAW; OR 3) USE A CRIMPER DISK (A SPECIALLY DESIGNED HEAVY DISK WITH NO OFFSET TO THE DIRECTION OF TRAVEL). MAKE MULTIPLE PASSES WITH THE CRIMPER AS NECESSARY TO SECURE THE STRAW.

4. INLET PROTECTION

INLET PROTECTION FILTERS CONSISTING OF INLET FILTER BAGS OR STONE AND GRAVEL WILL BE PROVIDED AT ALL STORM SEWER INLETS AS THEY ARE INSTALLED TO FILTER SEDIMENT–LADEN WATER PRIOR TO ENTERING THE STORM SEWER SYSTEM.

INSTALLATION: THE INLET PROTECTION FILTERS SHALL BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLAN AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

5. TOPSOIL STOCKPILE AREA

INSTALLATION: THERE WILL BE A DESIGNATED TOPSOIL STOCKPILE AREA LOCATED ON THE PROPERTY. THE LOCATION SHALL BE AS SHOWN ON THE E&S SITE PLANS AND ALL TOPSOIL AND EXCESS CUT MATERIAL FROM THE SITE SHALL BE STOCKPILED THERE. THE STOCKPILE WILL BE SURROUNDED WITH A MINIMUM 18" SILT SOCK TO PREVENT SEDIMENT–LADEN RUNOFF.

6. EROSION CONTROL BLANKET

THE NORTH AMERICAN GREEN S150BN EROSION CONTROL BLANKET, OR AN APPROVED EQUAL, SHALL BE INSTALLED ON ALL SLOPES 3:1 OR STEEPER.

INSTALLATION: INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

7. CONSTRUCTION WASTE RECYCLING/DISPOSAL

CONSTRUCTION WASTES ARE REFUSE MATERIALS GENERATED DURING THE COURSE OF CONSTRUCTION AND INCLUDE, BUT ARE NOT LIMITED TO, PAPER, PLASTIC, WOOD, FOOD, TEXTILE, AND METAL PRODUCTS.

INSTALLATION: THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING WASTE RECYCLING/DISPOSAL AREAS ON THE EROSION AND SEDIMENT CONTROL PLANS ONCE THEY HAVE BEEN DETERMINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL WASTE RECYCLING/DISPOSAL PERMITS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

MAINTENANCE: ALL CONSTRUCTION WASTE SHALL BE REMOVED BY THE CONTRACTOR AND DISPOSED OF AT A STATE APPROVED WASTE SITE AND IN ACCORDANCE WITH ALL LOCAL AND STATE CODES AND PERMIT REQUIREMENTS. THE BURNING OF WASTE MATERIALS SHALL NOT BE PERMITTED.

TEMPORARY CONTROL MEASURES

10. SILT FILTER BAG

FILTER BAGS MAY BE USED, IF NECESSARY, TO PREVENT SEDIMENT LADEN WATER THAT MAY BE PUMPED FROM TRENCHES FROM DISCHARGING INTO WETLANDS AND STREAMS OR OFFSITE. THEY SHALL BE MADE FROM NON–WOVEN GEOTEXTILE MATERIAL AND SHALL TRAP PARTICLES LARGER THAN 150 MICRONS. PUMPING RATES SHALL NOT EXCEED ONE–HALF MANUFACTURER'S SPECIFICATIONS, OR 750 SPM, WHICHEVER IS LESS. THE FOLLOWING INSTRUCTIONS SHALL SPECIFY CONDITIONS FOR ITS USE.

INSTALLATION:
1. INSTALL BAGS ON A WELL–VEGETATED, EROSION–RESISTANT AREA.
2. BAGS SHALL NOT BE PLACED ON A SLOPE GREATER THAN 5%.
3. BAGS MUST BE PLACED ON A DRY AREA, AWAY FROM STREAMS AND WETLANDS.
4. PUMP INTAKES SHOULD BE FLOATING AND SCREENED.

MAINTENANCE:
1. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE UNTIL THE PROBLEM IS CORRECTED.
2. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME HALF FULL.
3. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES MUST BE PROVIDED.
4. SPARE BAGS SHALL BE KEPT AVAILABLE ONSITE.
5. ALL CLEAN OUT MATERIAL SHALL BE DISCARDED IN AN UPLAND AREA, REMOTE OF ANY STREAM OR WETLAND, WITHIN THE CONSTRUCTION RIGHT–OF–WAY. ALL AREAS WILL BE STABILIZED.

11. CONCRETE WASHOUT

CONCRETE WASHOUTS SHALL BE CONSTRUCTED ONSITE TO CONTAIN ALL WASHOUT WATER FROM CONCRETE CONSTRUCTION ACTIVITIES. WASHOUTS SHALL BE CLEARLY MARKED.

INSTALLATION: WASHOUTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.

MAINTENANCE: WASHOUTS SHALL BE CLEANED OUT WHEN ACCUMULATED MATERIALS TAKE UP TWO–THIRDS OF THE AVAILABLE STORAGE CAPACITY. MATERIALS SHALL BE DISPOSED OF IN A PADEP–APPROVED FACILITY. MAKE ANY REPAIRS TO THE CONTAINMENT FACILITY AS NEEDED.

12. TRENCH PLUGS

TRENCH PLUGS SHALL BE INSTALLED AS NEEDED DURING ALL TRENCHING ACTIVITIES, IN ACCORDANCE WITH THE STANDARD DETAILS.

INSTALLATION:
1. PIPELINES WITH JOINTS THAT ALLOW A MANUFACTURED LENGTH OF PIPE TO BE PLACED IN THE TRENCH WITH THE PIPE JOINT ASSEMBLED IN THE TRENCH REQUIRE AN OPEN TRENCH THAT IS ONLY SLIGHTLY LONGER THAN THE LENGTH OF PIPE BEING INSTALLED.
2. THE TOTAL LENGTH OF EXCAVATED TRENCH OPEN AT ANY ONE TIME SHOULD NOT BE GREATER THAN THE TOTAL LENGTH OF PIPELINE/UTILITY LINE THAT CAN BE PLACED IN THE TRENCH AND BACKFILLED IN ONE WORKING DAY.
3. NO MORE THAN 50 FEET OF OPEN TRENCH SHOULD EXIST WHEN PIPELINE/UTILITY LINE INSTALLATION CEASED AT THE END OF THE WORKDAY.
4. TRENCH PLUGS ARE REQUIRED AT ALL WATER–BODY CROSSINGS REGARDLESS OF TRENCH SLOPE.
5. TOPSOIL MAY NOT BE USED TO FILL SACKS.

13. OUTLET PROTECTION

INSTALLATION: OUTLET PROTECTION WILL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH STANDARD DETAIL TO PREVENT SCOUR FROM EXCESSIVE VELOCITIES.

MAINTENANCE: ADDITIONAL STONE MAY HAVE TO BE ADDED PERIODICALLY TO MAINTAIN THE PROPER FUNCTIONING OF THE APRON.

STANDARD E&S WORKSHEET # 21
Temporary and Permanent Vegetative Stabilization Specifications

PROJECT NAME: Four Mile Run - Panther Hollow Lake
LOCATION: City of Pittsburgh, Allegheny County, PA
PREPARED BY: LJK DATE: 10/17/2019
CHECKED BY: KPK DATE: 10/17/2019

SPECIFICATIONS: The Department recommends the use of the Penn State publication, "Erosion Control and Conservation Plantings on Noncropland," as the standard to use for the selection of species, seed specifications, mixtures, liming and fertilizing, time of seeding, and seeding methods. Specifications for these items may also be obtained from PennDOT's Publication # 408, Section 804 or by contacting the applicable county conservation district. Upon selection of a reference, that reference should be used to provide all specifications for seeding, mulching, and soil amendments. The following specification will be used for this project:

(TEMPORARY)

*SPECIES:	ANNUAL RYE (PENNDOT FORMULA)	
% PURE LIVE SEED:	98%	%
APPLICATION RATE:	100	LB./ACRE
FERTILIZER TYPE:	10-20-20	(X-X-X)
FERTILIZER APPL. RATE:	680	LB./ACRE
LIMING RATE:	6.0	T./ACRE
MULCH TYPE:	STRAW	
MULCHING RATE:	3.0	T./ACRE

(PERMANENT)

TOPSOIL PLACEMENT DEPTH:	8"	IN.
*SPECIES:	20% PERENIAL RYE, 50% KENTUCKY BLUE, 30% CREEPING RED FESQUE	
% PURE LIVE SEED:	98%	%
APPLICATION RATE	200	LB./ACRE
FERTILIZER TYPE:	10-20-20	(X-X-X)
FERTILIZER APPL. RATE:	680	LB./ACRE
LIMING RATE:	6.0	T./ACRE
MULCH TYPE:	STRAW	
MULCHING RATE:	3.0	T./ACRE
ANCHOR MATERIAL:	N/A	
ANCHORING METHOD:	N/A	
RATE OF ANCHOR MATERIAL APPL.:	N/A	LB./ACRE
SEEDING SEASON DATES:	MARCH 15 - JUNE 1 / AUG 1 - OCT 15	

(PERMANENT - STEEP SLOPE)

TOPSOIL PLACEMENT DEPTH:	6"	IN.
*SPECIES:	30% ANNUAL RYE, 30% KENTUCKY 31 TALL FESQUE, 15% WHITE CLOVER, 15% CLIMAX TIMOTHY, 10% REDTOP	
% PURE LIVE SEED:	98%	%
APPLICATION RATE:	200	LB./ACRE
FERTILIZER TYPE:	10-20-20	(X-X-X)
FERTILIZER APPL. RATE:	680	LB./ACRE
LIMING RATE:	6.0	T./ACRE
MULCH TYPE:	STRAW	
MULCHING RATE:	3.0	T./ACRE
ANCHOR MATERIAL:	NORTH AMERICAN GREEN S150 STRAW BLANKET	
ANCHORING METHOD:	PER MANUFACTURERS SPECIFICATIONS	
RATE OF ANCHOR MATERIAL APPL.:	PER MANUFACTURERS SPECIFICATIONS	LB./ACRE
SEEDING SEASON DATES:	MARCH 15 - JUNE 1 / AUG 1 - OCT 15	

*If more than one species is used, indicate application rate for each species.

Note: This worksheet should be added to the plan drawings.

363-2134-008 / March 31, 2012 / Page 392

DRAFT

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

SciTek CONSULTANTS, INC.
1880 JOHN F. KENNEDY BLVD., SUITE 600
PHILADELPHIA, PA 19103
PHONE: (267) 341-5385 FAX: (267)519-0273
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4MR

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	LJK/KPK	CHECKED BY:	KPK	APPROVED BY:	KPK
DATE:	OCTOBER 2019	DWG SCALE:		PROJECT NO:	18-840

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: **C902**

TEMPORARY/PERMANENT VEGETATIVE STABILIZATION

INSTALLATION: FERTILIZING, SEEDING, AND MULCHING WILL BE USED AS A TEMPORARY/PERMANENT E&S CONTROL MEASURE ON ALL NON-PAVED DISTURBED AREAS. EXPOSED SOILS, NOT SUBJECT TO CONSTRUCTION TRAFFIC, SHALL NOT REMAIN UNSEEDED OR UNCOVERED BY MULCH FOR MORE THAN 4 DAYS, INCLUDING STOCKPILED SOIL MATERIALS. WITH REGARD TO THE TEMPORARY/PERMANENT SEED MIXES, REFER TO THE SEEDING MIXTURE TABLES PROVIDED. UNLESS THE OWNER'S REPRESENTATIVE DIRECTS OTHERWISE, VEGETATION SHALL BE ESTABLISHED AS FOLLOWS.

1. SOIL PLACEMENT: SOIL SHALL BE PLACED TO THE DESIGN THICKNESS AND GRADE AND TRACKED AND ROLLED INTO PLACE IN A MANNER THAT WILL NOT CAUSE EXCESSIVE COMPACTION. IF SOIL DENSITY IS VERIFIED IN THE FIELD, SOIL SHALL BE COMPACTED TO A DRY DENSITY BETWEEN 75 AND 100 POUNDS PER CUBIC FOOT, AFTER CORRECTION TO ZERO PERCENT COARSE FRAGMENT (PARTICLES LARGER THAN 2 MILLIMETERS) CONTENT.
2. SOIL TESTING AND SOIL AMENDMENT (LIME AND FERTILIZER) RATES: UNLESS SOIL TEST RESULTS AND RECOMMENDATIONS FROM THE STATE AGRICULTURAL EXTENSION SERVICE LABORATORY (PENN STATE AGRICULTURAL ANALYTICAL SERVICES LABORATORY [814-863-0841] OR EQUIVALENT SOIL TESTING LABORATORY) INDICATE OTHERWISE, EVENLY APPLY: 1) AGRICULTURAL GRADE GROUND LIMESTONE AT A RATE OF 6 TONS PER ACRE (CALCIUM CARBONATE EQUIVALENT BASIS); 2) FERTILIZERS TO SUPPLY 100-200-200 POUNDS PER ACRE N-P205-K20 (EXAMPLE: 10-20-20 FERTILIZER AT A RATE OF 1000 POUNDS PER ACRE); AND, 3) "BIOPAK" MICROBIAL SOIL INOCULANT (DISTRIBUTED BY PLANT HEALTH CARE, INC. [WWW.PLANTHEALTHCARE.COM OR 800-421-9051]). IF APPROVED PASTEURIZED PELLETIZED POULTRY MANURE (PASTEURIZED PPM) WITH AN ANALYSIS OF AT LEAST 4-2-3 (PERCENT N-P205-K20) IS USED, IT WILL BE ASSUMED THAT ONE TON MANURE WILL SUBSTITUTE FOR 60-40-60 POUNDS N-P205-K20 AVAILABLE IN THE FIRST YEAR. A PRE-APPROVED SOURCE OF PASTEURIZED PPM IS "MICRO-START60" AS MANUFACTURED BY PERDUE AGRIRECYCLE, LLC (WWW.MICROSTART60.COM <HTTP://WWW.MICROSTART60.COM> OR 302-628-2360).
3. SOIL AMENDMENT INCORPORATION: PROMPTLY TILL UNDER THE LIME AND FERTILIZER TO A DEPTH OF 2 TO 4 INCHES USING A DISK, HARROW, PLOW, ROTOTILLER OR OTHER SUITABLE EQUIPMENT. IF LIME REQUIREMENTS ARE LESS THAN 4 TONS PER ACRE OR SLOPES ARE TOO STEEP TO PERMIT SAFE TILLAGE, THE SOIL AMENDMENTS CAN BE MIXED INTO A HYDROMULCH SLURRY OR CAN BE TRACKED IN WITH A DOZER IN LIEU OF INCORPORATION. IF TRACKING THE SITE WITH A DOZER, TRACK IN A MANNER THAT LEAVES CLEAT MARKS PARALLEL TO SITE CONTOURS.
4. TEMPORARY SEEDING THAT WILL NOT BE FOLLOWED BY PERMANENT SEEDING, SUCH AS TOPSOIL STOCKPILES OR INTERIM GRADING PATTERNS, DO NOT REQUIRE THE APPLICATION OF SLOW RELEASE FERTILIZER OR "BIOPAK" INOCULANT.
5. SEEDBED PREPARATION: JUST BEFORE SEEDING, PREPARE SEEDBED BY TRACKING, RAKING, OR OTHER APPROPRIATE METHOD AS NECESSARY TO BREAK UP SOIL CRUSTS. IF TRACKING THE SITE WITH A DOZER, TRACK IN A MANNER THAT LEAVES CLEAT MARKS PARALLEL TO SITE CONTOURS.
6. SEEDING: EVENLY APPLY THE TEMPORARY/PERMANENT SEED MIXTURES USING HYDROSEEDING, BROADCAST, OR DRILL SEEDING METHODS THAT PLANT SEED LESS THAN ¼-INCH BELOW THE GROUND SURFACE: APPLY LEGUME SEED INOCULANTS SPECIFICALLY MADE FOR THE LEGUME SEED TYPE BEING APPLIED AT FIVE TIMES THE MANUFACTURER'S RECOMMENDED RATE. USE NO SEED OR INOCULANT THAT HAS BEEN IMPROPERLY STORED, EXPIRED, OR SEED OLDER THAN 9 MONTHS FROM THE SEED TEST DATE. IF HYDROSEEDING METHODS ARE USED SEED, INOCULANTS, FERTILIZERS, AND POLYMER TACKIFIER/SOIL STABILIZER (BELOW) MAY BE APPLIED IN ONE APPLICATION, PROVIDED THAT SEED AND INOCULANTS ARE NOT HELD IN A SLURRY WITH FERTILIZERS FOR MORE THAN ONE HOUR.
7. MULCHING AND TACKING: PROMPTLY AFTER SEEDING, MULCH USING EITHER: 1) "CURLEX" OR EQUIVALENT BRAND OF WOOD EXCELSIOR EROSION CONTROL BLANKET; 2) SYNTHETIC INDUSTRIES "TRM 450" OR NORTH AMERICAN GREEN "P-300" TURF REINFORCEMENT MAT; 3) STRAW APPLIED AT A RATE OF 6000 POUNDS PER ACRE, OR 4) WOOD/CELLULOSE FIBER HYDROMULCH APPLIED WITH A HYDROSEEDER AT A RATE OF 3000 POUNDS PER ACRE. WOOD/CELLULOSE FIBER HYDROMULCH MUST CONTAIN AT LEAST 50% VIRGIN WOOD FIBER. IF AT LEAST 1000 POUNDS PER ACRE APPROVED PASTEURIZED PPM IS BEING APPLIED WITH A HYDROSEEDER, WOOD/CELLULOSE FIBER HYDROMULCH RATES MAY BE REDUCED TO 2500 POUNDS PER ACRE.

   IN SOME LOCATIONS SHOWN ON THE DRAWINGS, SUCH AS SLOPES STEEPER THAN 3:1 (H:V), EROSION CONTROL BLANKET OR TURF REINFORCEMENT MAT (TRM) MAY BE THE ONLY PERMISSIBLE MULCHING OPTION. INSTALL EROSION CONTROL BLANKETS/TRM PER MANUFACTURER'S INSTRUCTIONS. STAPLE BLANKET/TRM IN PLACE USING 6-INCH (MINIMUM) SOD STAPLES IN ROWS AT THE EDGES AND CENTERLINE OF THE BLANKET AND ON 24-INCH OR CLOSER CENTERS.

   TACK STRAW IN PLACE USING EITHER: 1) A CRIMPER DISK, 2) WOOD/CELLULOSE FIBER HYDROMULCH APPLIED OVER THE STRAW AT A RATE OF 800-1000 POUNDS PER ACRE, OR, 3) WATER SOLUBLE LINEAR POLYACRYLATE (SODIUM ACRYLATE/ACRYLAMIDE) COPOLYMER "POLYMER" AT A RATE OF AT LEAST 8 POUNDS PER ACRE APPLIED IN MIXTURE WITH WATER OVER THE STRAW. APPROVED POLYMER BRANDS INCLUDE "WATERSORBTM PAM" OR "HYDROPAMTM", DISTRIBUTED BY POLYMERS, INC. (WWW.WATERSORB.COM OR 501-623-9995), "TERRAPAMTM", DISTRIBUTED BY PLANT HEALTH CARE, INC. (WWW.PLANTHEALTHCARE.COM OR 800-421-9051), AND "HYDROGEL BTM", DISTRIBUTED BY FINN CORPORATION (WWW.FINNCORP.COM OR 800-543-7166).

   TACK WOOD/CELLULOSE FIBER HYDROMULCH IN PLACE USING "POLYMER" SPECIFIED ABOVE AT A RATE OF AT LEAST 4 POUNDS PER ACRE APPLIED IN A SLURRY WITH THE HYDROMULCH.
8. OVER-SEEDING AND RE-SEEDING: WHEN THE SITE DEVELOPMENT STAGING OR SEASON WILL NOT PERMIT TIMELY SOWING OF THE PERMANENT SEED MIXTURE(S), PREPARE SOILS (FERTILIZERS AND LIME) AS FOR PERMANENT SEEDING, THEN SEED WITH TEMPORARY SEED MIXTURE AND MULCH, THEN OVERSOW THE PERENNIAL SEED MIXTURE INTO THE STUBBLE OF TEMPORARY VEGETATION AT THE NEXT APPROPRIATE SEEDING SEASON.

IF PERENNIAL SEED IS BEING SOWN INTO THE STUBBLE OF ACTIVELY GROWING TEMPORARY VEGETATION, MOW THE TEMPORARY VEGETATION TO REDUCE COMPETITION EITHER BEFORE OR IMMEDIATELY AFTER SOWING THE PERMANENT SEED.

MAINTENANCE: WATER AS NECESSARY TO ESTABLISH AND MAINTAIN VEGETATION. IN MOWED AREAS, MOW TO MAINTAIN GRASS HEIGHT BETWEEN 4 AND 6 INCHES TALL FOR FIRST TWO MONTHS OF GROWTH DURING THE ESTABLISHMENT YEAR, AND TO THE DESIRED HEIGHT THEREAFTER. IF STRING TRIMMERS ARE USED, TAKE MEASURES TO AVOID DAMAGE TO BARK OF TREES AND SHRUBS.

TABLE 4.1 COMPOST FILTER SOCK FABRIC MINIMUM SPECIFICATION

MATERIAL TYPE	3 MIL HDPE	5 MIL HDPE	5 MIL HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18'	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/8"
TENSILE STENGTH		26 PSI	26 PSI	44 PSI	202 PSI
ULTRAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% AT 1000 HR.	23% AT 1000 HR.		100% AT 1000 HR.	100% AT 1000 HR.
MINIMUM FUNCTIONAL LONGGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING	HDPE BIAXIAL NET				
	CONTINUOUSLY WOUND				
	FUSION-WELDED JUNCTURES				
	3/4" X 3/4" MAX. APERTURE SIZE				
OUTER FILTRATION MESH	COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH)				
	3/16" MAX. APERTURE SIZE				
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS					

MAINTENANCE PROGRAM

ALL E&S CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER (CLEANED, REPAIRED, ETC.) UNTIL ALL DISTURBED TRIBUTARY AREAS ARE STABILIZED. ALL TEMPORARY E&S CONTROLS WILL REMAIN IN PLACE UNTIL A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE, THE OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL PERMANENT FACILITIES.

1. ALL TEMPORARY RUNOFF E&S CONTROLS SHALL BE INSPECTED AT LEAST AT THE BEGINNING AND END OF EACH DAY AND AFTER EACH RUNOFF EVENT TO MAINTAIN THEIR EFFECTIVENESS. ANY DAMAGED CONTROLS SHALL BE REPAIRED OR REPLACED BY THE END OF THE WORKING DAY.
2. ROCK CONSTRUCTION ENTRANCE: ADDITIONAL STONE SHALL BE ADDED TO THE ROCK CONSTRUCTION ENTRANCE AND/OR ACCESS ROADS AS NEEDED TO MAINTAIN THEIR THICKNESS.
3. SILT SOCK: ACCUMULATED SEDIMENTS SHALL BE REMOVED, AS REQUIRED, IN ALL CASES WHERE ACCUMULATIONS HAVE REACHED HALF THE ABOVE-GROUND HEIGHT OF THE SOCK. IF THE SOCK HAS BEEN DAMAGED, IT SHALL BE REPAIRED, OR REPLACED IF BEYOND REPAIR. THE FILTER MEDIA WILL BE DISPERSED ON SITE ONCE THE DISTURBED AREA HAS BEEN PERMANENTLY STABILIZED. ADHERE TO ALL MANUFACTURERS' RECOMMENDATIONS.
4. INLET PROTECTION FILTER BAGS: ALL INLET PROTECTION FILTER BAGS SHALL BE CLEANED AND/OR REPLACED WHEN THE BAG IS HALF FULL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL DAMAGED FILTER BAGS SHALL BE REPLACED. THE ACCUMULATED SEDIMENT SHALL BE DISTRIBUTED EVENLY AMONG THE SITE AND STABILIZED.
5. SEDIMENT BASIN/TRAP: INSPECT THE SEDIMENT BASINS ON AT LEAST A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. REPAIR CLOGGED OR DAMAGED SPILLWAYS IMMEDIATELY. THE ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE SEDIMENT STORAGE (SD) ELEVATION WITHIN THE TRAP/BASIN IS ACHIEVED. DISTRIBUTE THE ACCUMULATED SEDIMENT EVENLY ACROSS THE SITE AND STABILIZE.
6. ALL SLOPES SHALL BE CHECKED FOR SIGNS OF EROSION AND/OR SEDIMENTATION.
7. ALL DISCHARGE LOCATIONS SHALL BE INSPECTED TO ASCERTAIN THE EFFECTIVENESS OF THE CONTROLS. ADDITIONAL CONTROL MEASURES SHALL BE IMPLEMENTED AS NEEDED.
8. DURING CONSTRUCTION, SEDIMENT REMOVED FROM THE EROSION CONTROL DEVICES SHALL BE DISPOSED OF BY SPREADING IT ONSITE. ONCE A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ESTABLISHED AND THE TEMPORARY E&S CONTROLS ARE REMOVED, ALL ACCUMULATED SEDIMENT WILL BE DISPOSED OF AT A PADEP APPROVED FACILITY.
9. ALL SITE ENTRANCE AND EXIT POINTS SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE TRACKING OF MUD. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CLEAN STREETS OF MUD AND KEEP THE STREETS IN A CLEAN AND DUST-FREE CONDITION.
10. SEEDED AND VEGETATED AREAS SHALL BE CHECKED REGULARLY TO INSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEEDED AS NECESSARY.
11. THE CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE AND INSPECTIONS, AND SHALL MAINTAIN RECORDS OF ALL INSPECTIONS. INSPECTIONS SHOULD BE LOGGED ON PADEP FORM 3150-FM-BWEW0083, DATED 2/2012 OR AS UPDATED, AND KEPT ONSITE AT ALL TIMES.

TABLE 11.1 TOPSOIL REPLACEMENT SPECIFICATIONS

CUBIC YARDS OF TOPSOIL REQUIRED FOR APPLICATION TO VARIOUS DEPTHS

DEPTH (in)	PER 1,000 SQUARE FEET	PER ACRE
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806
7	21.7	940
8	24.8	1,074

TABLE 4.2 COMPOST FILTER SOCK STANDARDS

ORGANIC MATTER CONTENT	25%-100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5-8.5
MOISTURE CONTENT	30%-60%
PARTICLE SIZE	30%-50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 dS/M (MMHOS/CM) MAXIMUM

SEQUENCE OF CONSTRUCTION

THE RENOVATION AND RE-CONSTRUCTION OF THE EXISTING PANTHER HOLLOW POND WILL CONSIST OF ONE GENERAL PHASE OF CONSTRUCTION. ALL E&S CONTROL FACILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED E&S CONTROL PLAN AND THE PADEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL DATED MARCH 2012.

A GENERALIZED CONSTRUCTION SEQUENCE IS PROVIDED BELOW. EACH CONSTRUCTION SEQUENCE IS INTENDED TO PROVIDE A GENERAL COURSE OF ACTION IN ORDER TO CONFORM TO THE APPLICABLE REGULATORY AGENCY REQUIREMENTS FOR TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENT POLLUTION CONTROL. ALL NECESSARY PARTS FOR PROPER AND COMPLETE EXECUTION OF WORK PERTAINING TO THIS PLAN, WHETHER SPECIFICALLY MENTIONED OR NOT, ARE TO BE PERFORMED BY THE CONTRACTOR. IT IS NOT INTENDED THAT THE DRAWINGS AND THIS REPORT SHOW EVERY DETAILED PIECE OF MATERIAL OR EQUIPMENT. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS LISTED IN THIS SECTION. THE CONTRACTOR MAY BE REQUIRED TO ALTER CONTROLS BASED ON EFFECTIVENESS OF CONTROLS OR DIFFERING CONDITIONS ENCOUNTERED. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO MINIMIZE THE EXTENT AND DURATION OF EARTH DISTURBANCE ACTIVITY.

1. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES (INCLUDING CLEARING AND GRUBBING), THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, AND A REPRESENTATIVE FROM THE ALLEGHENY COUNTY CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
2. UPON INSTALLATION OR STABILIZATION OF ALL PERIMETER SEDIMENT BMPS AND AT LEAST 3 DAYS PRIOR TO PROCEEDING WITH THE BULK EARTH DISTURBANCE ACTIVITIES, THE PERMITTEE OR CO-PERMITTEE SHALL PROVIDE NOTIFICATION TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT.
3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM IN. SHALL BE NOTIFIED 1-800-242-1776 FOR THE LOCATION OF EXITING UNDERGROUND UTILITIES.
4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PRECEDE IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS, DEVIATION FROM THE SEQUENCE MUST BE APPROVED BY THE ALLEGHENY COUNTY CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION. EACH STEP OF THE SEQUENCE SHALL BE COMPLETED BEFORE PROCEEDING TO THE NEXT STEP, EXCEPT WHERE NOTED.
5. LAYOUT THE LIMITS OF THE CONSTRUCTION SITE AND ESTABLISH BENCHMARKS AND REFERENCE POINTS.
6. STAKE OUT THE LIMITS OF DISTURBANCE (6.1 ACRES) AS INDICATED ON THE CONSTRUCTION PLANS.
7. INSTALL THE ROCK CONSTRUCTION ENTRANCES (2) AS SHOWN ON THE PLAN AND IN ACCORDANCE WITH THE STANDARD DETAIL.
8. INSTALL ORANGE CONSTRUCTION FENCE AROUND AREAS OF PANTHER HOLLOW WHICH ARE NOT TO BE DISTURBED DURING CONSTRUCTION, AS SHOWN ON THE PLANS. ALSO CONSTRUCT ORANGE CONSTRUCTION FENCE AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.
9. INSTALL SILT SOCK, 1,2,3, IN THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL BEING CAREFUL NOT TO DISTURB THE EXISTING WOODLANDS THAT ARE OUTSIDE OF THE DELINEATED LIMITS OF DISTURBANCE. ALL COMPOST FILTER SOCK SHALL BE INSTALLED PARALLEL TO THE CONTOURS.
10. CLEARING, GRUBBING, AND EARTH WORK OPERATIONS WITHIN THE DRAINAGE AREAS TO THE PERIMETER CONTROLS MAY COMMENCE WHEN ALL PERIMETER CONTROLS ARE INSTALLED AND OPERATIONAL.
11. BEGIN CLEARING AND GRUBBING ACTIVITIES NEEDED TO RE-CONSTRUCT THE EXISTING PANTHER HOLLOW LAKE, TAKING CARE NOT TO WORK BEYOND THE PERMIT BOUNDARY SHOWN ON THE PLAN. PLACE STRIPPED TOPSOIL IN THE TOPSOIL STOCKPILE AREAS DESIGNATED ON THE PLAN AND/OR REMOVE FROM SITE. STOCKPILE LOCATIONS MAY VARY IN THE FIELD, AND ADDITIONAL STOCKPILE LOCATIONS MAY BE USED AS NECESSARY. ALL TOPSOIL STOCKPILE AREAS SHALL BE FULLY ENCLOSED WITH SILT SOCK AS PER THE STANDARD DETAIL. INSTALL THE CONCRETE WASHOUT FACILITY AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.
12. PERFORM CUT AND FILL OPERATIONS TO BRING THE PANTHER HOLLOW POND SITE TO THE PROPOSED FINAL SUBGRADE ELEVATIONS. UTILIZE ROCK FILL UNDERDRAINS, AS NECESSARY, TO CARRY THE IMPACTED EXISTING LAKE AND ANY ENCOUNTERED GROUNDWATER THROUGH THE PROPOSED GRADING. STABILIZE STAGING AREA AS SOON AS FINAL SUBGRADE ELEVATIONS ARE REACHED. RE-GRADE TO DESIGN GRADES AND UTILIZE A PUMP AND FILTER BAG TO DEWATER THE LAKE DURING CONSTRUCTION.
13. CONSTRUCT PERMANENT BERM ON THE WESTERN SIDE OF PANTHER HOLLOW LAKE WITH APPROPRIATE SPILLWAY AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE STANDARD DETAIL.
14. BEGIN ROUGH GRADING ON SITE AND ALL FILL AREAS SHALL BE PLACED AND COMPACTED ACCORDING TO THE PROJECT EARTHWORK SPECIFICATIONS. CONSTRUCT FILL KEYS AND SUBSURFACE DRAINS AS SHOWN ON THE CONSTRUCTION DRAWINGS AND AS NECESSARY DURING EARTHWORK. PLACE TOPSOIL AND INSTALL EROSION CONTROL BLANKETS ON ALL SLOPES 3H:1V OR GREATER IN ACCORDANCE WITH THE STANDARD DETAIL. AT THE END OF EACH WORKING DAY NO MORE THAN 10 FEET OF SOIL SHALL BE EXPOSED WITHOUT BLANKET ON ANY PERMANENT SLOPES STEEPER THAN OR EQUAL TO 3H:1V. IMMEDIATE STABILIZATION IS REQUIRED UPON TEMPORARY CESSATION OF WORK, 4 OR MORE DAYS, OR AS SOON AS GRADED AREA REACHES FINAL GRADE.
15. AS FILL SLOPES GRADES ARE ACHIEVED BACK-CUT SLOPES TO DIVERT THE RUNOFF TO THE BMP'S SHOWN ON THE PLANS.
16. AS DISTURBED AREAS WITHIN A PROJECT APPROACH FINAL GRADE, PREPARATIONS SHOULD BE MADE FOR SEEDING AND MULCHING TO BEGIN. IN NO CASE SHOULD AN AREA EXCEEDING 15,000 SQUARE FEET WHICH IS TO BE STABILIZED BY VEGETATION, REACH FINAL GRADE WITHOUT BEING SEEDED OR MULCHED.
17. FINE GRADE AND STABILIZE ALL AREAS OF THE SITE. ALL UNPAVED DISTURBED AREAS SHALL BE STABILIZED IMMEDIATELY WITH SEED AND MULCH ONCE GRADING IS COMPLETE OR WITHIN FOUR (4) DAYS ONCE THE CONSTRUCTION HAS BEEN COMPLETED. INSTALL THE APPROPRIATE EROSION CONTROL BLANKETS FOR ALL SLOPES STEEPER THAN 3:1.
18. FILL SLOPES SHOULD BE SEEDED AND MULCHED AT REGULAR VERTICAL INCREMENTS – 15 TO 25 FEET MAXIMUM – AS FILL IS BEING CONSTRUCTED. THIS WILL ALLOW THE BOTTOM OF THE FILL TO PROGRESS TOWARD STABILIZATION WHILE WORK CONTINUES ON THE UPPER PORTION, MAKING STABILIZATION EASIER TO ACHIEVE AND PROVIDING SOME VEGETATIVE BUFFERING AT THE BOTTOM OF THE SLOPE.
19. NOTIFY THE LICENSED PROFESSIONAL OR THEIR DESIGNEE AT LEAST 2 DAYS PRIOR TO THE START OF THE OF THE STORMWATER MANAGEMENT SYSTEM CONSTRUCTION. THE LICENSED PROFESSIONAL OR THEIR DESIGNEE MUST BE PRESENT DURING THE LAKE RE-CONSTRUCTION.
20. ONCE THE SITE IS PERMANENTLY STABILIZED, REMOVE THE DEWATERING DEVICES AND THE COFFERDAMS. REFER TO STORMWATER MANAGEMENT PLAN FOR NOTES AND DETAILS.
21. WATER THAT IS BEING PUMPED FROM WORK AREAS MUST BE TREATED FOR SEDIMENT REMOVAL PRIOR TO DISCHARGING TO SURFACE WATERS UNLESS IT CAN BE SHOWN THAT THE QUALITY OF THE WATER BEING PUMPED ALREADY MEETS DISCHARGE STANDARDS. IF A PROPERLY FUNCTIONING SEDIMENT BASIN OR SEDIMENT TRAP IS AVAILABLE, THE PUMP DISCHARGE MAY BE ROUTED THROUGH THE TRAP OR BASIN.
22. ONCE A UNIFORM 70% PERENNIAL VEGETATIVE COVER IS ACHIEVED ON ALL DISTURBED AREAS BEGIN REMOVAL OF ALL REMAINING TEMPORARY CONTROL MEASURES. REMOVE FILTREXX SOCKS BY SLASHING OPEN AND SPREADING MULCH AND SEEDING. REMOVE THE REMAINDER OF TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES. DISPOSE OF ACCUMULATED SEDIMENT AT A PADEP-APPROVED FACILITY.

TOPSOIL REPLACEMENT SPECIFICATIONS

1. GRADED AREAS SHOULD BE SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES TO PERMIT BONDING OF THE TOPSOIL TO THE SURFACE AREAS AND TO PROVIDE A ROUGHENED SURFACE TO PREVENT TOPSOIL FROM SLIDING DOWN THE SLOP.
2. TOPSOIL SHOULD BE UNIFORMLY DISTRIBUTED ACROSS THE DISTURBED AREA TO A DEPTH OF 4 TO 8 INCHES MINIMUM, 2 INCHES ON FILL OUTSLOPES.
3. SPREADING SHOULD BE DONE THAT SODDING/SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL PREPARATION OR TILLAGE.
4. IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOIL PLACEMENT SHOULD BE CORRECTED IN ORDER TO PREVENT FORMATION OF DEPRESSIONS UNLESS SUCH DEPRESSIONS ARE PART OF THE PCSM PLAN.
5. TOPSOIL SHALL NOT BE PLACED IF TOPSOIL OR SUBSOIL IS FROZEN OR MUDDY, EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
6. COMPACTED SOILS SHOULD BE SCARIFIED 6 TO 12 INCHES ALONG CONTOUR WHEREVER POSSIBLE PRIOR TO SEEDING.

DRAFT

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

SciTek CONSULTANTS, INC.
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4MR

PITTSBURGH PENNSYLVANIA

PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: LJK/KPK	CHECKED BY: KPK	APPROVED BY: KPK
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 18-840

EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO.: C903

PITTSBURGH
PENNSYLVANIA

PGH2O

Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

DETAILED CONSTRUCTION SPECIFICATIONS

Prepared For:

The City of Pittsburgh, Department of Public Works
Parks Maintenance Division
and
Pittsburgh Water and Sewer Authority

Prepared By:

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

DETAILED CONSTRUCTION SPECIFICATIONS
The City of Pittsburgh, Department of Public Works and Pittsburgh Water and Sewer Authority
Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

TABLE OF CONTENTS

SECTION 01 11 00

SUMMARY OF WORK (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

A. Description: The work for the City of Pittsburgh and the Pittsburgh Water & Sewer Authority (Owners) at the Panther Hollow Lake Dam (Site) consists of, but is not limited to, the dredging of Panther Hollow Lake, excavation to reshape the existing lake and construction of a settling forebay pond, the construction of a principal spillway pipe system, the construction of an emergency drawdown pipe and valve, the construction of an open channel emergency spillway including a concrete control section and cutoff wall, placement of select fill to raise the existing earthen embankment, revegetation of disturbed areas, and erosion and sediment control measures.

Work also includes clearing and grubbing of work areas, demolition of existing site features, abandonment of an existing waterline, drawdown of the lake water levels, temporary construction facilities, and construction access using a temporary railroad crossing or an access road from a nearby public building.

B. Scope: This Contract includes all work as shown on the Contract Drawings, as specified in the Contract Specifications, or as directed by the Owner or their appointed representative.

C. Schedule: The Contractor shall coordinate all work with the Owner or their appointed representative. The lake shall be drawn down by the Contractor to Elevation 801 prior to beginning construction, to permit the work to be constructed in the dry in accordance with paragraph "Lake Drawdown".

1.2 SUBMITTALS

A. As soon as possible after Notice of Award and prior to commencing any work at the project Site, the Contractor shall submit a Work Plan for approval. The Owner or Owner's Representative will review the Work Plan for format and content.

B. Submit the results of the existing conditions survey for approval prior to beginning construction.

C. The Contractor shall submit for approval plans for intended haul routes for hauling materials to and from the project Site, including temporary haul routes and restoration efforts.

D. The Contractor shall submit copies of all hauling permits needed for construction.

1.3 PROJECT LOCATION

The project Site is located in the center of Allegheny County in southwestern Pennsylvania, approximately 3.4 miles east of the confluence of the Allegheny and Monongahela Rivers with the Ohio River and just northeast of the intersection of Panther Hollow Road and Boulevard of the Allies. The Site is located primarily on the Pittsburgh East 7.5 minute United States Geologic Survey quadrangle map. The Site is located at approximately latitude 42˚26'13" and longitude 79˚56'57".A site location map is provided on the Contract Drawings.

1.4 CONTRACTOR'S USE OF PREMISES

A. Storage and Staging Areas: Store or stage materials and equipment in designated area(s) shown on the Contract Drawings and in areas approved by the Owner or their appointed representative. Areas required by the Contractor and not shown on the Drawings shall have erosion and sediment pollution control measures designed and installed by the Contractor and approved by the Owner or their appointed representative prior to use.

B. Preservation of Existing Features:

1. Before beginning any work, survey the Site and examine the Contract Drawings and Specifications to determine the extent of the work. Record existing conditions in the presence of the Owner or their appointed representative showing the condition of structures and other facilities adjacent to and within the work areas. Digital photographs or paper photographs with minimum size of 4 inches by 6 inches will be acceptable as a record of existing conditions. Include site features in the record of existing conditions including, but not limited to, existing public or private roads, the elevation of the top of foundation walls, weir walls, finish slab elevations, manholes or catch basins, possible conflicting utilities, the location and extent of existing cracks and other damage, existing dam embankment elevations, and description of surface conditions that exist prior to starting project work. Contract Drawings may be used to record existing conditions.

2. Confine operations to within the Contractor Work Limits shown on the Contract Drawings. Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Owner. Repair or replace damaged items as approved by the Owner or their appointed representative. Construct and maintain sheeting, shoring, bracing, and supports as required. Ensure that structural elements are not overloaded at any point during construction. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this Contract. Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Owner or their appointed representative prior to performing such work. All additional work associated with damages incurred by the Contractor's construction activities or neglect shall be the Contractor's responsibility at no additional expense to the Owner.

C. Existing Utilities:

1. The Contractor shall be responsible for coordination and protection of all existing above and below ground utilities within the work area and for providing utilities for construction purposes. The general location of utilities on the contract drawings shall not relieve the Contractor of the responsibility to protect and/or avoid any utility service during operations under this contract, both within and immediately outside the defined limits of work. The Contractor shall verify the total extent and location of all utility service(s) in the vicinity of the project site by contacting the Pennsylvania One Call System, Inc., Telephone 8-1-1 or 1-800-242-1776 or by contacting the Owner, for utilities located on private property. All costs associated with the use of the Pennsylvania One Call System, Inc., shall be borne by the Contractor.

2. The Contractor shall identify any utilities which could present interference, or be damaged by equipment or construction activities prior to performing any construction operations. Interfering services shall be protected, temporarily relocated, or avoided, as necessary, during the course of the work. Any temporary relocation shall be approved by, and coordinated with, the utility company and the Owner, at the Contractor's expense. Any damage to existing utilities caused by the Contractor's construction activities or neglect shall be repaired or replaced by the Contractor to the utility company or Owner's satisfaction, at no expense to the Owner.

D. Hauling Restrictions:

1. The Contractor shall be responsible for acquiring all necessary general or oversized hauling permits for any equipment or materials transported via roadways, as required. No heavy hauling on public roads will be permitted until all permits and bonds have been obtained as required. All costs associated with securing these permits and bonds shall be borne by the Contractor. Permits shall not relieve Contractor of liability for damage resulting from moving equipment and materials to and from the project site.

2. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. When intending to transport equipment and materials on public and private roadways, the Contractor shall investigate the adequacy of existing roadways and all weight limits for these roadways and shall secure any required bond(s) from the respective Owner(s). The Contractor shall document the existing conditions of the roadways with the Owner(s) thereof. All damage to transportation facilities, public or private property, or utilities caused by the Contractor's construction activities or neglect shall be repaired in kind to the satisfaction of the respective Owner(s) at no additional cost to the Owner(s).

3. Roads shall be kept clear on a daily basis of all debris generated by the Contractor's operations. Roads shall be cleaned immediately of any spillage or accumulations.

4. Upon completion of all work requiring use of the roadways, the roadways shall be restored to their preconstruction condition, as documented herein, by cleaning and reconstruction of damaged drainage facilities, base courses, and pavements or surface courses as necessary. Repairs shall be made in the same manner as the original construction. No separate payment will be made for maintaining and restoring the condition of the roadways, and all costs in connection therewith shall be considered as incidental to performance of the work.

1.5 PRECONSTRUCTION MEETING

At least 7 days prior to starting any earth disturbance activities, including clearing and grubbing, the Contractor shall schedule and conduct an onsite Preconstruction Meeting. The attendees of the meeting shall include, but not be limited to, representatives from the Owner, the Owner's Representatives, Contractor and/or their subcontractors, the Allegheny County Conservation District, the Pennsylvania Department of Environmental Protection, appropriate municipal or other agency officials, and any other personnel deemed necessary by the Owner or approving agencies. The meeting shall be conducted to discuss construction related concerns and ensure proper procedures will be followed throughout construction. Any concerns from the Contractor shall be brought to the attention of the attendees during the meeting.

1.6 WORK BY OTHERS

Other active Contract work may be underway at the project site during performance of the work under this Contract. Contractor shall coordinate with contractors of other work to not interfere or disrupt the other work.

PART 2 – PRODUCTS

2.1 AGGREGATES

Aggregates for Contractor staging/laydown areas shall be in accordance with Section 31 05 16 AGGREGATES FOR EARTHWORK.

2.2 GEOTEXTILE

Woven geotextile for Contractor staging/laydown areas shall be in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK.

PART 3 – EXECUTION

3.1 CONTRACTOR WORK PLAN

A Work Plan shall be developed by the Contractor for approval prior to commencing work at the project site and shall include all means and methods of construction to be implemented by the Contractor. Work shall not commence until the Contractor's Work Plan is accepted in writing. Acceptance of the Contractor's Work Plan shall not relieve the Contractor of the responsibility or liability for bodily injury or property damage caused by the Contractor's personnel or the operation of equipment, nor will approval be cause for any delay claims resulting from the failure of the Contractor to adequately plan and phase the work. The Work Plan shall include details and phasing schedules for each of the Contractor's activities.

3.2 CONTRACTOR STAGING/LAYDOWN AREAS

The Contractor's staging/laydown areas shall be as indicated on the Drawings or as otherwise directed or approved by the Owner or their appointed representative. The Contractor shall not disturb any trees within the staging/laydown areas. The Contractor shall protect all trees and root structures.

3.2.1 Aggregate Placement

Placement of aggregates for Contractor staging/laydown areas shall be in accordance with Section 31 05 16 AGGREGATES FOR EARTHWORK.

3.2.2 Geotextile Installation

Installation of geotextile for Contractor staging/laydown areas shall be in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK.

END OF SECTION

SECTION 01 22 00
GENERAL REQUIREMENTS (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the general conditions for earthwork activities to be performed under this Contract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL SAFETY RULES

These General guidelines are to be incorporated as part of the Contract Documents. They represent the minimum safety requirements the Owner requires of the Contractor. Other specific Owner Safety Policy requirements may be appended as necessary.

3.1.1 STANDARD REQUIREMENTS

A. Contractor shall submit for review by the Owner or his appointed representative a formal site and safety program prior to mobilizing at the jobsite. After agreement on the program is reached with the Owner or his appointed representative, the program will be implemented by Contractor for the duration of the project.

B. The site safety program will not be provided as a submittal for approval.

C. Compliance officers of any bona fide regulatory agency shall be allowed to survey Contractor's work area with the full cooperation of the Contractor.

D. Contractor shall designate an individual to act as his safety officer and be his representative on all matters relating to jobsite safety.

E. Contractor shall have, during all working hours, an individual on the site who is currently certified in first aid. Contractors will furnish their own first aid supplies.

F. Contractor is responsible for seeing that his employees are provided with all safety supplies, fire extinguishers, personal protective equipment and other items deemed appropriate for safe working conditions.

G. Contractor shall not allow employees to have in their possession alcoholic beverages or drugs or be under the influence of either. Violators will be removed from the site immediately.

H. Any safety related coordination problem which exists between two or more contractors is to be immediately brought to the attention of the Owner or his appointed representative.

I. All employees are recommended to wear cotton or fire resistant clothing and gloves when a potential for exposure to excessive heat exists. Additionally, fire resistant clothing may be required as will be communicated in your site-specific hazard training.

J. An MSHA approved hardhat must be worn at all times while on mine property. Hardhats must be in good condition with no cracks. The must have 6 square inches of reflective tape on both sides and the back. The employees first and last name in a minimum ½” tall letters and the company name or logo must be on the hat.

K. High visibility clothing must be worn at all times while on mine property. There must be 24 square inches of reflective and fluorescent material on both front and back of the outermost layer of clothing above the waist. To comply with this standard the employee may use reflective vest, belt shoulder straps, sew on reflective materials or iron on reflective materials.

L. When performing specialty task such as electrical work, working in oil areas, handling certain chemicals, operating electronic controls such as shield and remote control devices, welding, etc., other approved gloves may be worn.

M. When safety belts are required to be worn by previous (B) of the General Requirements and preceding Section 5 “Safety Belts and Rigging”, then safety harnesses shall be worn.

N. Employees must have hearing protection available for use at all times. Earplugs or hearing protection permanently affixed to the hardhat can be used. It is policy that you must wear your hearing protection in designated areas.

O. Hard-toed safety shoes with metatarsal protection shall be worn at all times while on Owner’s property in all locations both underground and on surface.

P. Eye protection with side shields shall be worn at all times while on Owner's property. Prescription glasses must meet the ANSI standard. NO EXCEPTIONS.

Q. There will be no smoking or use of open flames except in designated areas.

R. Safety belts shall be worn and tied off when working at elevated heights.

S. Noise and dust control devices shall be worn when exposed to long durations of noise and dust.

T. All personal injury and/or vehicle accidents shall be reported to the Supervisor of the appropriate location.

U. No firearms will be allowed on Owner’s property.

V. All employees are required to wear appropriately fitting clothing. No clothing that is excessively baggy or loose will be permitted. Shorts or cut-offs are not appropriate. Long pants must be worn at all times. Long sleeve shirts (which cover the entire arm) are preferred but not mandatory.

W. Unauthorized personnel shall not experiment with or engage in operating any equipment while on the site.

X. Electrical equipment must be locked out and tagged at the unit safety disconnect switch at equipment location when personnel are working on or near equipment which may be accidentally energized. If safety switch at equipment location is not provided then this requirement must be accomplished at the Motor Control Center. Contractor must comply with local Owner's lockout policy. The lockout policy shall be posted for all contractor employee access.

Y. At the end of each working day, the Contractor shall ascertain that all Contractor personnel have exited the site.

Z. Contractors have the responsibility to keep their areas free of hazards and to comply with safety regulations as set out by state and the federal regulations.

AA. All injuries, regardless how minor, must be reported to the Owner or his appointed representative. If a major injury or life threatening injury occurs, the injury or accident must be reported immediately to:

1. Owner's or his appointed representative.
2. State and Federal Authorities

BB. Each contractor will be responsible for the cleanup and housekeeping of their working area(s). No debris will be allowed to accumulate in a manner that restrains the work of other crews in the area.

3.1.2 ELECTRICAL, WELDING AND CUTTING

A. All electrical cords must be elevated when in use (hung overhead on wooden or insulated racks or other suspended devices). If electric cords or electrical wiring must be on scaffold, floor, or ground, proper protection must be provided in a manner so the cord will not be walked or driven on.

B. All electrical tools and cords must be inspected by an MSHA qualified electrician prior to contractor proceeding with any work.

C. All electrical tools and electric cords will be inspected and color-coded each month.

D. All welding machines must have a fire extinguisher on the welding machine as well as an additional fire extinguisher in the area of the actual welding.

E. All electric welders and electrical generators or light plants must be grounded from the frame with copper wire to a ground rod and have a proper ground clamp on the ground rod.

F. All gauges for acetylene and oxygen bottles will be removed and stored during transportation. Proper covers to be placed on bottles and bottles are to be secured in the upright position during transportation.

G. Oxygen and acetylene bottles are to be covered with proper covers and secured in upright position during storage, and when not in use.

H. Fire extinguishers are required on two-wheeled or bottle racks as well as a fire extinguisher in the area where cutting torch is being used.

I. All cutting torch carts, two wheeled, etc. with acetylene bottles and oxygen bottles must have a cover over the top of the cart to protect gauges from falling objects.

J. All electric hand grinders are to have a fire extinguisher in the grinding area.

K. Welders, oxygen and acetylene bottles being lifted by crane or other lifting device must be lifted with proper chokers and bottles must be fastened in a rack made for this purpose.

3.1.3 FUEL STORAGE TANKS

A. All fuel storage tanks must be marked with their contents. All fuel tanks must have a flammable sign as well as a no smoking sign. All fuel tanks must be inside a berm. The berm must be large enough to contain all of the contents if the tank should rupture. This rule also applies to fuel oil storage, motor oil storage, and waste oil storage. Oil drums on a rack are required to have drip buckets.

B. Fuel tanks on a pickup truck must be marked the same as above.

C. All fuel storage tanks either stationary or on a vehicle must have at least two fire extinguishers at their location.

D. All fuel cans (five gallon or smaller) must be of the safety type, marked as to what the can contains and have a fire extinguisher in the area of the can.

E. All propane tanks, skid mounted, etc. on the construction site must have a berm around the tanks, or other means of barrier so tanks will not be hit with a vehicle. Tanks must be marked "Flammable - No Smoking" and have two fire extinguishers in the area of the tank.

3.1.4 LADDERS AND SCAFFOLDS

A. Straight and extension ladders must be tied off.

B. Approved aluminum or steel ladders are to be used.

C. Stepladders must be fully opened and set level.

D. Do not work from top step on stepladders.

E. All ladders are to be inspected and color-coded the first of each month.

F. All scaffolding must have handrails, knee rails, and toeboards.

G. All scaffolding with wheels must have wheels locked before using.

H. Scaffolds are not to be moved with persons on them.

I. Employees working on scaffolds must be tied off if over two lifts high.

J. Use ladders for access to scaffolds, never climb bracing.

K. Cable supported scaffolds, or cable-climbing scaffolds must be inspected daily and a daily inspection log maintained.

3.1.5 SAFETY BELTS AND RIGGING

A. Proper safety belts and lanyards must be used and tied off to immovable objects overhead with a maximum fall of six feet when working on the following:

1. Sloping roofs.
2. Flat roofs without handrails within four feet of the edge or roof opening.

3. Any suspended platform or stage.
4. Any scaffold with incomplete handrail or decking.
5. Ladders near edge of roofs and floor openings.
6. Generally, any elevated work area without protection to prevent workers from falling.

B. Safety belts and lanyards are to be inspected for safety before each use.

C. Multiple lanyards may be required for 100% full time tie off.

D. Know proper use of chainfalls, come-alongs, chokers, shackles and clamps.

E. Never raise a load over people.

F. Use tag lines to control loads.

G. Know capacities of rigging equipment and weights of loads.

3.1.6 SUBMITTALS

A. The Contractor shall furnish to Owner or his appointed representative, for approval, before work commences the following for the Contractor and subcontractors:

1. A completed copy of the Contractor Safety Data sheet.
2. Their MSHA ID Number and a copy of their MSHA Part 48 Safety Program (training plan current approval letter.
3. A copy of their safety policy and procedures.
4. A copy of the State (where the project is located) current safety program approval and State ID number, if applicable in that State.
5. A copy of their site-specific safety program, designed to assure compliance with federal and state laws, as well as all applicable Owner policies. Such program shall include:

    a. A daily examination of the work place for compliance.
    b. A weekly written report to the site superintendent, which details any deficiencies noted during the daily examinations, and corrective action initiated to remedy deficiencies. Owner or his appointed representative will not accept any weekly report with deficiencies shown without corrective action initiated.
    c. A Hazard Communication Program in compliance with MSHA 30 CFR Part 47.

B. Prior to the commencement of work, the Owner or his appointed representative shall survey the work site and identify all known work place hazards excluding those hazards created by the activities of the Contractor. Operating management shall either eliminate the hazards identified or, where elimination is not practical, provide to the Contractor a written warning.

C. The Contractor, together with the Owner or his appointed representative, shall determine the area of the Contractor's control. Where feasible, the Contractor shall be responsible for barricading his/her area of control by rope or other means approved by the Owner or his appointed representative. No Contractor employees, Owner employees or visitors shall be permitted within the Contractor's area of control unless such employee receives hazard training from the Contractor. The Contractor shall include the names of any Owner employees or visitors receiving hazard training in the weekly report.

D. Any Owner supervisory personnel observing a Contractor or his/her employee not following the safety program submitted for qualification shall address the problem with the Contractor's supervisor in charge. If reasonable efforts do not cause the Contractor to correct significant deficiencies in safety performance, that Contractor should be terminated.

E. Any Owner supervisor personnel observing the existence of an imminent danger to any person or to Owner's property as a result of action by the Contractor or as a result of any Contractor activity shall immediately cause a cessation of activity in the area of the imminent danger and should not allow work to resume until the dangerous conditions are corrected.

F. Quality and appropriateness of hazard training shall be reviewed and approved by the Owner or his appointed representative. Hazard training programs shall include:

1. Hazard Training Manual
2. Instruction by a qualified person familiar with conditions and hazards of the work area above and beyond what is covered in the Hazard Training Manual; and
3. Completion of Waiver of Liability form where applicable.

G. All Contractors working on Owner property, even when accompanied by Owner personnel, must check-in and checkout on a daily basis. The Contractor check-in and checkout procedure will insure that only authorized and properly trained personnel are permitted on site. Minimum requirements will include:

1. Approved list of Contractor employees
2. Name, company represented
3. Date and time in and out
4. Purpose of business
5. Method to visually identify Contractors (e.g., badges, colored hard hats, vehicle placards)

H. The Contractor shall require any subcontractors to adhere to the above requirements. This includes designating work areas under a subcontractor's exclusive control.

I. A Contractor or subcontractor is anyone other than an Owner employee who comes onto Owner's property to perform services for the Owner. Excluded are such persons as consultants, OEM representatives, delivery persons, office workers, and individuals who do minor, non-hazardous repairs, e.g. a computer repairman. They should be treated as visitors and receive hazard training if they are to enter the Contractors work area.

3.2 HAZARD COMMUNICATION PROGRAM

The OSHA Hazard Communication Standard (hereafter the "Standard") (29CFR 1910.1200) became effective May 25, 1986. The purpose of the Standard is to ensure that information concerning the hazards of all chemicals present in a workplace is transmitted to affected employees. Owner is covered by the Standard. In order to comply with the Standard, the Owner requires that Contractor adhere to the latest revision of (29 CFR 1910.1200 of the following-which ever applies.

3.2.1 CONTRACTOR RESPONSIBILITY

A. Prior to coming onto Owner's property, information must be submitted on each chemical which will be brought onto the property. The information furnished will include the information required by the Standard for Material Safety Data Sheets [29 CFR 1910.1200 (G) (2)]. The Request for Chemical Information, form found in the Reference Section, shall be completed and returned to Owner or his appointed representative for review. Chemicals which have not been reviewed pursuant to this procedure will not be brought onto Owner's property.

B. All containers of hazardous chemicals brought onto Owner's property by you will be labeled in accordance with the requirements of the Standard [29 CFR 1910.1200(F)].

C. Contractor will be afforded an opportunity to review a list of the hazardous chemicals to which Contractor’s employees may be exposed to while performing work on Owner's property, together with information concerning some of the appropriate protective measures relating to such chemicals.

D. Contractor will be required to certify review of Owner's procedures concerning the requirements of the Standard has occurred and Contractor’s employees will comply with those procedures. This certification will be incorporated into the Contract documents between Contractor and Owner.

E. It will be Contractor’s responsibility to dispose of waste chemicals properly according to the manufacturer's instructions as well as federal, state and local regulations. There will be no disposal of waste chemicals or waste materials on Owner's property.

F. All parties involved with this construction project must agree that strict enforcement of the requirements of the Standard will result in a safer workplace for all personnel. If Contractor has any questions regarding Owner’s procedures, please contact Owner. If Contractor has any questions regarding the requirements of the Standard, please contact the local OSHA office.

3.3 PROJECT MEETINGS

3.3.1 GENERAL

A. This Section specifies administrative and procedural requirements associated with engineering, pre-construction conference, and progress meetings.

B. All project meetings shall be administered by the Owner’s Representative. Contractor shall record significant proceedings and decisions as meeting minutes and distribute copies of all meeting minutes to attendees unless otherwise noted.

C. Attendance at project meetings shall be required of representatives of the Owner, the Contractor, and any subcontractors as pertinent to the agenda.

3.3.2 ENGINEERING MEETING

A. Weekly engineering review meetings, or meetings as scheduled by the Owner Representative, will be held at Owner's Site office or Contractor's Site office as designated by the Owner’s Representative to review progress of engineering and design development.

3.3.3 PRE-CONSTRUCTION CONFERENCE

A. Prior to commencement of construction activities, but not later than ten days after execution of Owner-Contractor Agreement, a pre-construction conference will be conducted at a time and place designated by the Owner’s Representative.

B. Owner’s Representative will notify Engineer and Contractor of proposed conference date. Notification shall precede such date not less than five days.

C. The Owner, Engineer, and Contractor will be represented at conference by persons familiar with and authorized to conclude matters relating to Work. As a minimum, Contractor shall be represented by its superintendent and project manager.

D. During conference the following items may be discussed:

1 Construction schedule.
2 Work sequencing.
3 Designation of responsible personnel.
4 Procedures for processing field decisions and Change Orders.
5 Procedures for processing Applications for Payment.
6 Submittal of Shop Drawings, Certifications and other similar documents.
7 Access to site and site utilization.
8 Material storage.
9 Material and equipment deliveries.
10 Safety procedures.
11 Housekeeping.
12 Security.
13 Work hours.
14 Temporary facilities.
15 Quality and Work standards.
16 Other appropriate topics.

3.3.4 JOB PROGRESS MEETINGS

A. General: Progress meetings will be conducted at the Project Site by the Owner's Representative for the duration of the project to review the progress of the work.

B. Schedule: Meetings will be conducted on a weekly basis as scheduled by the Owner's Representative unless otherwise notified by the Owner's Representative. Time and location to be designated at the pre-construction meeting.

C. Attendees: Owner and Contractor shall be represented at each meeting by persons familiar with and authorized to conclude matters relating to Work. Periodically, representatives of material manufacturers may also be required to attend. As a minimum, Contractor shall be represented by its superintendent and/or project manager.

D. Agenda: During each meeting the following items may be discussed:

1 Revisions to minutes of previous progress meeting.
2 Review of Work progress.
3 If progress is behind schedule, review Contractor's plan for expediting work.
4 Review work that will be accomplished prior to next meeting.
5 Review submittals.
6 Discuss off-site fabrication, material, and equipment deliveries.
7 Identify and review any problems on-site or off-site which impede the progress of the project.
8 Accidents (bodily injury and property damage).
9 Housekeeping.
10 Work hours.
11 Quality and work standards.
12 Field decisions and change orders.
13 Owner's Operations.

3.3.5 REPORTING

A. Not later than 5 (five) days following date of engineering meeting, pre-construction conference and each progress meeting, Contractor or Contractor's Representative shall prepare and distribute meeting minutes. Distribution shall include all attendees.

B. If meeting discussion identifies need to revise planned construction activities, Contractor shall, within (5) days of meeting date, submit to Owner or his appointed representative a revised Contractor's Construction Schedule.

3.4 PROJECT CONSTRUCTION SCHEDULES

3.4.1 SCOPE

A. Within 14 (fourteen) calendar days of project award a schedule shall be provided to the Owner or their appointed representative by the Contractor. The schedule shall include detailed engineering, procurement and construction activities in sufficient detail, satisfactory to the Owner or his appointed representative, to track the progress of the work. When necessary for changeover work or shutdown work, a schedule is to be provided and used to expedite the work.

B. Contractor shall provide the most economical schedule to perform the work outlined in these bid documents. This schedule will provide the Completion Date in this bid proposal. The Contractor shall take this into account in preparing the proposal and shall utilize latest available equipment and construction technologies and schedule workforce to cause the work to be performed in an efficient manner.

3.4.2. FORMAT OF SCHEDULES

A. Prepare the schedule using the following guidelines:

1. Provide a separate horizontal line for each operation or event.
2. Identify last workday of each week on a horizontal time scale.
3. Use sufficient scale and spacing to allow space for updating.

B. Schedule size shall be agreed to by the Owner or his appointed representative prior to the submittal.

3.4.3 CONTENT OF SCHEDULES

A. Provide complete sequence of construction by activity for the following:

1. Engineering milestones.
2. Shop drawings and product data:
    a. Submittal dates.
    b. Dates approved shop drawings will be required.
3. Product procurement and delivery dates.
4. Beginning and completion dates of each construction activity.
5. Operational shutdowns or outages.

B. Identify work of separate phases or other logically grouped activities.

C. Provide separate 8-l/2 in. x 11 in. or 11 in. x 17 in. sub schedules as necessary showing submittals, review times, procurement schedules, and delivery dates.

3.4.4 COORDINATION WITH OTHER ACTIVITIES

A. The Contractor shall note other construction activities may be occurring simultaneously. The Contractor shall schedule and closely coordinate its work so that the work will not interfere with other construction activities.

3.4.5 UPDATING

A. Show all changes occurring since previous submission of updated schedule.

B. Indicate progress of each activity and show completion dates. If schedule has slipped, show how the Work will be completed to maintain major event completion dates and contract end dates.

C. Include the following:

1. Major changes in scope.
2. Activities modified since previous updating.
3. Revised projections due to changes.
4. Other identifiable changes.

3.4.6 CONSTRUCTION SCHEDULE SUBMISSION TO OWNER

A. Submit schedule before the start of final design and/or procurement of materials or equipment.

B. Submit contract schedules before any field work other than mobilization is performed.

1. Owner or his appointed representative will review schedules and return review copy within ten days after receipt.
2. If required, resubmit schedules within seven days after return of review copy.
3. Submit one reproducible transparency and one opaque print.
4. Make prints from reviewed transparency for distribution.

C. Submit an updated schedule monthly at the same time as the payment application. Updated schedule shall include all changes and percent complete for each task.

3.4.7 DISTRIBUTION

A. Distribute copies of schedules to the following:

1. Owner.
2. Contractor's jobsite file.
3. Other Contractors engaged in the Work.

B. Instruct recipients to report any inability to comply, and provide detailed explanation with suggested remedies.

3.5 SUBMITTALS

3.5.1 GENERAL

A. Submit to the Owner’s Representative shop drawings and product data required by specification sections.

B. Prepare and submit, with Construction Schedule, a separate schedule listing dates for submission and dates reviewed shop drawings and product data will be needed for each product.

C. Contractor shall prepare and submit to the Owner or his appointed representative a list of all products and materials to be incorporated in the work. No product or materials shall be permitted to be included in the work of this project without prior approval. One annotated copy of each submission will be returned to the Contractor for his record.

3.5.2 APPLICATION AND CERTIFICATION FOR PAYMENT

A. The Contractor shall submit Application for Payment to the Owner in accordance with the requirements of the Contract Documents.

B. Application and Certification for Payment shall be made using Owner's document, Application for Payment and Payment Schedule.

C. Contractor shall submit Application for Payment for work actually completed on the original contract, based upon the approved Schedule of Values.

D. Contractor shall submit a separate Application for Payment for work actually completed on changes to the original contract, for which the Contractor has submitted a Request for Change Order and the Owner has issued a Change Order to the original contract.

3.5.3 REQUEST FOR CHANGE ORDER

A. Contractor, when directed to perform extra work, shall prepare and submit to the Owner or his appointed representative a Request for Change Order:

1. Request for Change Order is a written request prepared by the Contractor for a change in the contract sum for extra work or time extension. Request for Change Order shall include a description of extra work, calculation of value of extra work in accordance with the terms and conditions of the Contract Documents, and back-up information substantiating cost.
2. The Request for Change Order shall, if applicable, identify the originator of the request, e.g., Owner representative(s) and the appropriate reference, e.g., meeting minutes, telephone request, drawing change, etc.
3. Request for Change Order shall be numbered serially and dated whether or not the request is approved.
4. The Owner or his appointed representative will review the Request for Change Order and, for approved request, will issue a "Change Order" adjusting the contract sum or completion date.

3.5.4 CHANGE ORDERS

A. The Owner or his appointed representative will issue a Change Order for all approved Request for Change Orders.

1. A Change Order is a written order during the life of this Agreement to the Contractor signed by the Owner, issued after execution of the Contract, authorizing a change in the work, extra work, or an adjustment in the contract sum or time of performance.
2. Change Order will be numbered serially.
3. Contractor, upon receipt of Change Order shall add items of work and value to the Application for Payment and Schedules of Values.

3.5.5 DESIGN DRAWINGS, SPECIFICATIONS AND DATA

A. To the extent identified by these Contract Documents, Contractor shall furnish engineering, design drawings, specifications and data on the requested work and shall submit these as required by this section.

B. General Submission Requirements

1. Drafting standards and practice:
   a. All drafting standards and practices shall be subject to Owner's representative approval.
   b. Drawings, title block, description and numbering system shall be in accordance with Owner's representative standard practice. Drawing sheet size shall be 22" x 34" unless otherwise noted.
2. Accompany each submittal with a transmittal letter containing the date, project number and title, Contractor's name and address, and any other pertinent data.

C. Preliminary Design Information

1. Contractor shall submit, during the progress of engineering, electronic (PDF Format) or hard copies as required by the Owner's representative, of preliminary engineering drawings and information as requested. Submittals shall be marked "For Information" and dated.

D. Approval of Design Information

1. Contractor shall submit, during the progress of engineering, the number of copies which the Contractor requires plus electronic (PDF Format) or hard copies as required by the Owner or his appointed representative which will be retained by the Owner's representative of the following, but not limited to:
   a. All design drawings. (With the Owner's Consent, drawings submitted for approval may be 50% reduced, e.g. 11 inch x 17 inch)
   b. Design calculations for equipment.
   c. Design calculations for structures.
   d. Design specifications.
2. Submittals shall be marked for approval.

E. Construction Information

1. Contractor shall submit electronic (PDF Format) or hard copies, as required by the Owner's representative, of all drawings and specifications released for construction. Submittal shall be marked for construction.

3.5.6 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Shop Drawings

1. Original drawings, prepared by Contractor, its subcontractor, supplier or distributor, which illustrates some portion of the work; showing fabrication, layout, setting or erection details.
2. Prepared by qualified detailer.
3. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
4. Sheet size: 22 inches x 34 inches
5. Reproductions for Submittals: Electronic data files in Adobe Acrobat format or hard copies as required.

B. Product Data

1. Manufacturer's standard schematic drawings:

   a. Modify drawings to delete information which is not applicable to project.
   b. Supplement standard information to provide additional information applicable to project.

2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
   a. Clearly mark each copy to identify pertinent materials, products or models.
   b. Show dimensions and clearances required.
   c. Show performance characteristics and capacities.
   d. Show wiring diagrams and controls.

3. Electronic (PDF Format) and two (2) hard copies of an Operation and Maintenance Manual containing all manufacturers' catalog cuts and operating instructions shall be submitted with certified shop drawings to Owner or his appointed representative complete, in every respect, to show all equipment furnished. Maintenance Instructions, Lubrication Manuals, and recommended spare parts lists are to be part of this manual. A letter of transmittal addressed to Owner or his appointed representative and containing a list of suppliers of all replacement parts shall accompany the manual.

C. Contractor Responsibilities

1. Review Shop Drawings and Product Data prior to submission.
2. Verify:
   a. Field measurements.
   b. Field construction criteria.
   c. Catalog numbers and similar data.
3. Coordinate each submittal with requirements of Work and of Contract Documents.
4. Subcontractor's responsibility for errors and omissions in submittals is not relieved by Owner's representative review of submittals.
5. Subcontractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Owner's representative review of submittals, unless Engineer gives written acceptance of specific deviations.
6. Notify Owner or his appointed representative in writing, at time of submission, of deviations in submittals from requirements of Contract Documents.
7. Begin no work which requires submittals until return of submittals with Owner's or his appointed representative stamp and initials or signature indicating review.
8. After Owner's representative review, distribute copies.

D. Submissions Requirements

1. Schedule submissions at least 14 to 16 days before dates reviewed submittals will be needed. The Owner or his appointed representative will need 8 to 10 days for review and mailing.
2. Submit Shop Drawings and the number of copies of Product Data which Contractor requires for distribution and electronic (PDF format) or hard copies, as required by Owner, which will be retained by the Owner or his appointed representative.
3. Accompany submittals with transmittal letter, in duplicate containing:
   a. Date.

b. Project title and number.
c. Subcontractor's name and address.
d. The number of each Shop Drawing and Product Data submitted.
e. Notification of deviations from Contract Documents.
f. Other pertinent data.

4. Submittals shall include:

a. Date and revision dates.
b. Project title and number.
c. The names of:
    1) Owner.
    2) Contractor.
    3) Or its subcontractor.
    4) Supplier.
    5) Manufacturer.
    6) Separate detailer when pertinent.
d. Identification of product or material.
e. Relation to adjacent structure or materials.
f. Field dimensions, clearly identified as such.
g. Specification section number.
h. Applicable standards, such as ASTM number or Federal Specification.
i. A blank space, 3 in. by 4 in., for the Engineer's stamp.
j. Identification of deviations from Contract Documents.
k. Subcontractor's stamp, initialed or signed, certifying the review of submittal, verification of field measurements, and compliance with Contract Documents.
l. Reference details to sheet and detail numbers shown on Contract.

E. Resubmission Requirements

1. Shop Drawings:
    a. Revise initial drawings as required and resubmit as specified for initial submittal.
    b. Indicate on drawings any changes which have been made other than those requested by Owner or his appointed representative.
    c. Product Data: Submit new data as required for initial submittal.

F. Distribution of Submittals After Approval

1. Distribute copies of approved Shop Drawings and Product Data which carry Owner or Owner Representative’s stamp to:
    a. All affected subcontractors, suppliers and fabricators.
    b. Subcontractor’s jobsite office.
    c. Contractor’s Required Copies
    d. Owner electronic (PDF format) or hard copies as required.

G. Owner or appointed representative Duties

1. Review submittals with reasonable promptness.
2. Review for:
    a. Design concept of project.
    b. Information given in Contract Documents.
3. Review of separate items does not constitute review of an assembly in which item functions.

4. Affix stamp and initials or signature certifying to review of submittal.
5. Return submittals to Contractor for distribution.

H. As-Built Drawings

1. Upon completion of work, Contractor shall provide Owner or his appointed representative with one (1) set of originals, corrected to reflect "as-built" conditions; two (2) sets of copies of these originals; and one (1) electronic copy of corrected As-built drawings on CD in PDF Format and AutoCad Format.

3.5.7. DAILY FIELD REPORT

A. Contractor shall submit to the Owner or his appointed representative by noon of each working day the manpower count, total shift man-hours, and brief description of the work that is being performed. Format of report shall be subject to Owner's representative approval.

B. Any extra work performed must be noted. Time and materials that will be claimed as an extra must be so noted and Owner's approval must be obtained daily. Time claimed that has not been approved by Owner's representative on a daily basis will not be approved, NO EXCEPTIONS.

3.6 SCHEDULE OF VALUES

3.6.1 SUBMITTAL

A. Submit the Schedule of Values to Owner or his appointed representative for items of work included in the contract. Submittal shall be made within 10 (ten) calendar days following the pre-construction meeting, but in all cases, at least 10 (ten) working days prior to submission of the first "Application for Payment."

B. Support values given with data that will substantiate their correctness upon request of Owner or his appointed representative.

C. Submit quantities of designated materials.

D. Payment for materials stored on-site will be limited to those materials listed in Schedule of Values.

E. Upon receipt of an approved "Change Order" issued by the Owner, Contractor shall revise this "Schedule of Values" to include the changes to the work and the applicable value.

F. Use Schedule of Values only as basis for Contractor's Application for Payment.

G. Submit typewritten schedule of monthly invoices for duration of Work with the Schedule of Values.

3.6.2 FORMAT

A. Use format approved by Owner or his appointed representative as a basis for listing costs of Work.

B. Identify each line item with number and title.

C. Identify and itemize each major component of Work.

D. Identify and itemize each minor component for each major component of Work.

E. Itemize quantity and total value of the materials and of the installation for each minor component.

F. Limit extent of breakdown to those minor components for which progress payments are expected.

G. Total of all costs listed in schedule shall equal total contract sum.

3.6.3 REVIEW AND RESUBMITTAL

A. After review by Owner or his appointed representative, revise and resubmit invoice schedule and Schedule of Values if required.

B. Resubmit revised schedule in same manner.

3.7 TEMPORARY FACILITIES

3.7.1 GENERAL REQUIREMENTS

A. Contractor shall provide, at own cost and expense, all temporary services required for the Work, except where it is stated herein that these items will be furnished free of charge by the Owner. The Contractor shall install, operate, protect service and maintain the temporary services during the construction period of the project, and remove all temporary facilities not required to be left in place by the Owner.

B. Temporary connections to new and/or existing permanent service lines shall be made at locations as directed by the Owner; and, when the temporary service lines are no longer required, they shall be removed by the Contractor. Contractor shall receive the approval of the Owner prior to making any temporary connections to existing permanent service lines, and prior to shutting off or disconnecting any existing operational services.

3.7.2 TEMPORARY FIELD OFFICE

A. Owner will determine location of Contractor's field office on site, if necessary. Provide tables and desks and chairs. Provide a lockable filing cabinet in which copies of all approved shop drawings, product data and permits shall be filed.

B. Contractor shall pay the cost of all fuel used for the field office facilities and for the cost of all electrical energy used for the field office facilities.

C. Mount all temporary electric and telephone lines at a height designated by the local utility companies, subject to the approval of Engineer.

3.7.3 TEMPORARY ELECTRICAL POWER

A. If required, Contractor shall provide electrical generators equipped with adequate circuit breakers or fuses equipped with ground fault protection or safeguards to meet applicable safety standards with sufficient outlets to meet project needs. All electrical cables or wiring must be run in a manner such that cable or wiring is not subject to any type of hazard.

B. If Applicable, the Owner shall provide single-phase 480v temporary power (unless 480v, 3-phase, 3-wire is required) to a location designated by the Owner.

C. If Applicable, Owner shall also provide a pole and 240/120-50 kva (200 amp) transformer at the temporary power drop.

D. If Applicable, Contractor shall be responsible for all equipment, labor, etc. to convey power to its field office or for its construction needs.

E. Contractor shall provide and install all items from the transformer to the termination point, including but not limited to weatherhead, all conduit and wire, distribution/breaker panels, and sub-panels that the Contractor shall require for the work during the Contract time. All panels shall be equipped with ground fault protection to meet all safety requirements. Provide sufficient outlets to meet project needs. All electrical cables or wiring must be run in a manner such that cable or wiring is not subject to any type of hazard.

F. Contractor shall pay the cost of all electrical energy which is used for the Work as herein described.

1. Provide and be responsible for any temporary lighting, wiring and lamps required for adequate illumination during construction for Work operations and safety of personnel.
2. Removal of all temporary wiring.

3.7.4 TEMPORARY WATER SERVICE

A. Any existing permanent water supply system on the site is available for use to provide a temporary water supply for construction purposes in the areas of construction. If none is available or, if the requirements exceed the capacity of the existing supply, Contractor shall provide temporary water supply.

B. Contractor shall make all temporary service connections required to be made to the existing permanent water supply system and shall provide all supplementary distribution equipment required to bring an adequate supply of water to valved outlets within the areas of construction. From these valved outlets, Contractor shall provide all supplementary hoses, valves, and outlets required for the Work.

C. Contractor shall pay the cost of all water from the existing permanent water supply system which is used for the Work. Contractor shall provide an adequate supply of drinking water at a convenient location on the site.

3.7.5 TEMPORARY SANITARY FACILITIES

A. Contractor shall provide temporary portable chemical toilets and bathhouse facilities acceptable to public health authorities for the use of all construction employees and Owner's representatives. The number of facilities shall be equal to one (1) toilet for each twenty (20) employees present on the job, but not less than two (2) units, located throughout the construction site. Contractor shall maintain temporary toilets in a sanitary condition.

B. Contractor's workers shall not use Owner's toilets in existing facilities or other subcontractors' portable chemical toilets.

C. All temporary facilities, such as sanitary, shall meet or exceed the minimum requirements as established by the local public health authority or any other regulatory agency having jurisdiction on this construction site.

3.7.6 TEMPORARY FIRST AID FACILITIES

A. Contractor shall provide temporary first aid facilities as required by any regulatory agency having jurisdiction on this construction site.

3.7.7 TEMPORARY FIRE PROTECTION

A. Contractor shall provide temporary fire protection as required by insurance requirements or by any regulatory agency having jurisdiction on this construction site.

3.7.8 TEMPORARY STORAGE FACILITIES

A. Contractor, if required for use, shall provide substantial watertight storage sheds for materials which may be damaged by the weather. Sheds shall be built with floors raised at least 6" above the ground.

B. Contractor shall not unreasonably encumber the site with materials or equipment. Storage shall be limited to quantities as required for the progress of the Work.

C. Contractor shall prepare and maintain outside storage facilities as required to protect material from damage. No reinforcing bars, structural steel, equipment, or other items subject to damage and/or contamination shall be stored directly on the ground.

3.7.9. SECURITY

A. Contractor shall provide all security that may be required during the working and non-working hours to protect the work, materials or equipment.

3.7.10 <u>NOTICES AND POSTING</u>

A. All governing regulations, building permit, special notices, regulations and restrictions, and other warnings given to the workmen shall be printed or typed and displayed under cover at suitable locations within or adjacent to the area of construction.

3.7.11 PROJECT SIGN

A. Contractor identification signs shall not be permitted on the premises unless approved by Owner.

3.7.12 BARRICADES AND ENCLOSURES

A. Contractor shall provide and maintain any enclosures, fences, barriers, lanterns, signs, etc. required to protect the public and workers and as required by any regulatory agency having jurisdiction on the construction site.

B. Contractor shall take special precautions against damage to materials and work installed in freezing weather by providing temporary heat, temporary enclosures, and coverings to prevent damage by the elements in a manner approved by Owner or his appointed representative. The ground surfaces under footings and all masonry, concrete, and other subject to damage shall be protected against freezing or ice formations. If low temperatures make it impossible to continue operations safely in spite of cold weather precautions, Contractor shall cease work and shall notify the Owner or his appointed representative.

3.8 SUBSTITUTIONS AND PRODUCT OPTIONS

3.8.1 SCOPE OF WORK

A. Substitutions of equipment, materials, or products shall be requested in writing and submitted to the Owner or his appointed representative for review and approval using the procedures required by the Contract Documents or these specifications.

B. Each product or material proposed for installation in the work of this project shall be approved prior to its use.

C. During the bidding period, requests will not be considered for the substitution of any products or materials specified.

D. After the award of the Contract, the Owner or his appointed representative will consider formal requests from the Contractor for the substitution of products or materials in place of those specified.

3.8.2 CONTRACTOR’S OPTIONS

A. For products specified only by a reference standard, Contractor may select any product meeting those standards of any manufacturer.

B. For products specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or approved equal" after the specified products, Contractor may select any named product or may submit a request for substitution for any product not specifically named.

C. For products specified by naming several products or manufacturers without indicating the option of selecting equivalent products, Contractor shall use one of the named products or manufacturers.

D. For products specified by naming only one product and manufacturer, and indicating "NO SUBSTITUTIONS", there is no option, and no substitution will be allowed.

3.8.3 SUBSTITUTIONS

A. Contractor shall submit 10 (ten) copies of each request for substitution. Each request shall include the following:

1. Data substantiating compliance of the proposed substitutions with all the requirements of the Contract Documents.
2. For products, include the trade name and the manufacturer's name and address; the manufacturer's literature describing the product, performance, test data, and reference standards; any samples (if applicable); and the name and address and completion date of similar projects on which the product was used.
3. For construction methods, include a detailed description including drawings and/or photographs of the proposed methods.
4. Itemized comparison of the proposed substitution with the product or construction method specified.
5. Data relating to any changes in the proposed construction schedule and any relationship of the substitution to the work of other parts of the work.
6. Accurate cost data on the proposed substitution in comparison with the product or construction method specified.

B. In making a request for substitution, the Contractor represents the following:

1. Contractor has personally investigated the proposed product or method and has determined that it is equal to or superior than the method specified in all respects.
2. Contractor will provide the same guarantee for the substitution as is required for the product or method specified.
3. Contractor will coordinate the installation of any accepted substitution into the work, making such changes as may be required for the work to be completed in all respects.
4. Contractor waives all claims for additional costs related to the substitution which consequently become apparent.

C. Substitutions will not be considered if they are indicated or implied on any shop drawing or product data submittal without a formal request for such substitution submitted in accord with the above, or if acceptance of the substitution would require substantial revision to the Contract Documents.

3.9 CLEAN-UP

3.9.1 SCOPE

A. Contractor shall clean up accumulations of waste, debris, and rubbish caused by Contractor and their Subcontractor's activities as they occur or as directed by Owner’s representative.

B. At completion of Work, Contractor shall remove all tools, equipment, machinery, and surplus materials; leave site clean and ready for occupancy.

C. Contractor shall restore to original condition those portions of the site not designated for alterations by the Contract Documents.

3.9.2 SAFETY REQUIREMENTS

A. Standards: Maintain project in accord with all applicable safety and insurance standards.

B. Hazards Control:

1. Store volatile wastes in covered metal containers and remove from premises daily.
2. Prevent accumulation of wastes which create hazardous conditions.
3. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on project site.
2. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways.

3.9.3 DURING CONSTRUCTION

A. Execute cleaning to ensure that building, grounds and public properties are maintained free from accumulations of waste materials and rubbish.

B. Wet down dry roadways, laydown areas, materials, rubbish, etc. to prevent dust.

C. Owner reserves the right to clean the site weekly and dispose of the debris at the Contractor's expense if Contractor fails to maintain a clean Work site in accordance with General Safety Rules.

D. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off Owner's property.

E. Handle materials in a controlled manner with as few handling as possible. Do not throw materials from heights.

3.9.4 FINAL CLEANING

A. In preparation for Substantial Completion, conduct final inspection of sight-exposed and exterior surfaces and concealed spaces.

B. Repair, patch and touch-up marred or damaged surfaces to specified finish, to match adjacent surfaces.

3.10 PROJECT RECORD DOCUMENTS

3.10.1 SCOPE

A. Provide and maintain one copy of the following documents at the job site:

1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Reviewed Shop Drawings and Product Data.
5. Change Orders.
6. Other Modifications to Contract.
7. Field Test Records.

3.10.2 MAINTENANCE OF DOCUMENTS

A. General

1. Store documents in temporary field office, apart from Construction Documents.
2. File documents in accordance with project filing format in Uniform Construction Index.
3. Maintain documents in clean, dry, legible condition.
4. Do not use record documents for construction purposes.
5. Make documents available at all times for inspection by Owner or his appointed representative.

3.10.3 RECORDING

A. General

1. Label each document "PROJECT RECORD" in 2 in. high printed letters.
2. Keep record documents current.
3. Do not permanently conceal any work until required information has been recorded.

B. Contract Drawings: Legibly mark to record actual construction.

1. Horizontal and vertical location of appurtenances referenced to permanent surface improvements.
2. Location of internal appurtenances concealed in construction referenced to visible and accessible features of structure.
3. Field changes of dimension and detail.
4. Changes made by change order or field order.
5. Details not in original Contract Drawings.

C. Specifications and Addenda: Legibly mark up each section to record the following:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
2. Changes made by change order or field order.
3. Other matters not originally specified.

D. Shop Drawings: Maintain as record documents. Legibly mark the following drawings to record changes made after review:

1. Equipment layouts.
2. Structural steel.

3.10.4 SUBMITTAL

A. At substantial completion of project, but prior to final payment, Contractor shall deliver record documents identified in items C. and D. below to Owner or his appointed representative.

B. Accompany submittal with transmittal letter, in duplicate, containing the following:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Title and number of each record document.
5. Certification that each document as submitted is complete and accurate.
6. Signature of Contractor or his authorized representative.

C. Project Record Documents

1. Record Documents maintained in the field.
   a. Provide two (2) sets of certified shop drawings.
   b. Provide two (2) original sets of original As-built design drawings.
   c. Provide all Project Record Documents listed above in pdf format on compact disk (CD) or a digital memory device including any auxiliary files necessary to use the drawings. A separate written list shall identify the contents of each device including file name, drawing number, title, etc.

D. Service and Operations Manuals

1. Contractor shall carefully compile, during the progress of the work, electronic (PDF Format) and two (2) hard copies of all pertinent and required data which shall constitute the service and operational manuals for this project. The required data includes, but is not limited to, the following:

a. Instructions and recommendations for the care and cleaning of all types of visible surface materials.
b. Individual section for recommended lubrication schedule and routine maintenance for all equipment items.
c. Descriptions of all systems and equipment, including start-up, operational, and service instructions. Descriptions shall include -- as applicable -- diagrams, identification charts, color coding, connections, lubrication instructions, single line and detailed wiring diagrams. Manufacturer's catalog data may be used wherever possible; otherwise, written instructions prepared by the subcontractors shall be obtained.
d. Names, addresses and phone numbers of service companies for each mechanical item for the Owner's use after the expiration warranty period.

2. Design of Manuals
   a. Manuals shall be organized into individual volumes as required for ease of use. A rough draft of manuals shall be submitted to Owner or his appointed representative for review and approval.
   b. Each manual shall be marked to show the following:
      1) Project title.
      2) Contract title.
      3) Names of the OWNER and Contractor.
      4) Complete index of all sections.
   c. Construction manual:
      1) Volume size 8-1/2" x 11" x 2-1/2" thickness maximum.
      2) Bound using three-ring post binders.
      3) Hard back covers.
      4) Front cover and edge marked as indicated above.
      5) Section dividers shall be furnished.

END OF SECTION

SECTION 01 32 23

SURVEY AND LAYOUT DATA (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the overall project survey control and procedure requirements to meet all survey and positional accuracy requirements for this Contract.

1.2 SUBMITTALS

A. Submit a detailed Surveying and Layout Plan showing the equipment used and calibration records, field data collection and data processing techniques and procedures, and the survey quality control procedures.

B. Submit qualifications and experience of the Professional Land Surveyor for approval prior to performing any project surveying and layout.

1.3 PROJECT SURVEY CONTROL

A. Existing horizontal and vertical control work points to be used by the Contractor to lay out the project baselines are shown on the Contract Drawings. The Contractor shall verify the elevations and positions of the existing control work points or benchmarks prior to their use to establish the project baseline work points and Contractor established survey control points. The Contractor shall notify the Owner or their appointed representative of any discrepancies prior to commencing work.

B. All work to be constructed under this Contract shall be constructed accurately from measurements made from the benchmarks and survey control points established by the Contractor as necessary to construct all work within proper alignment. The Contractor shall establish the project work points shown on the Contract Drawings and any other temporary survey control as may be necessary to carry out the requirements of this Contract. All temporary survey controls shall be based off the existing project survey control.

C. Benchmarks and survey control points shall be identified on the as-built drawings and shall be use for production of as-built drawings, as in accordance with Section 01 77 00 CLOSEOUT PROCEDURES.

1.4 RESPONSIBILITIES

The Contractor has the overall responsibility to utilize the proper equipment and establish the procedures and methodologies to perform all survey tasks outlined in the Contract Drawings and Specifications. The Owner or their appointed representative has the right to review and approve all survey plans, but approval does not relieve the Contractor of the responsibility to satisfy all positional accuracy and tolerance requirements of the Contract Drawings and Specifications.

1.5 QUALIFICATIONS AND EXPERIENCE

The Contractor shall have a Professional Land Surveyor licensed within the United States on staff that shall be responsible for performing or supervising all surveying and layout work performed as part of this Contract. The Professional Land Surveyor shall have experience in the use of the equipment and field data collection techniques outlined in the Contractor's detailed Surveying and Layout Plan.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 PROCEDURES AND METHODOLOGIES

The Contractor shall use the appropriate survey equipment and procedures as deemed necessary to assure the positional accuracy requirements are met or exceeded as called for throughout this Contract. The Contractor will be required to submit a work plan in accordance with other technical sections of these Contract Specifications that shall include detailed descriptions of the procedures and equipment that will be used to complete the specified requirements.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the submittal requirements to be performed under this Contract prior to, during, and after construction.

1.2 SUBMITTALS

A. As soon as possible after Notice of Award and prior to beginning any work, submit four copies of the Progress Schedule and the Schedule of Values as a package for approval. The Owner or their appointed representative will review the Progress Schedule and the Schedule of Values for format and content.

B. Prepare a list of submittals and submit to the Owner or their appointed representative prior to the start of construction.

1.3 SCHEDULES

A. <u>Progress Schedule</u>: Progress Schedule shall be in bar chart format showing estimated start and completion dates for each part of the work. The first progress payment will not be issued until an acceptable progress schedule is submitted and approved.

B. <u>Schedule of Values</u>: Submit a Schedule of Values (in dollars) based on the Contract Bid Schedule, including all bid items. Break each bid item in the Schedule of Values into component parts involving a series of operations for which progress payments may be requested. The total costs for the component parts shall equal the bid amount for that item, and the total cost of all bid items shall equal the Contract sum. The Owner or their appointed representative may request data to verify accuracy of dollar values.

1.4 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. <u>General Procedures</u>:

1. As specified in the individual Specification Sections, the Contractor shall forward submittals to the Owner or their appointed representative at least 30 days prior to the required approval date. Unless a different number is specified, submit three copies of each shop drawing, three specimens of each sample, and three copies of all other submittals requested, all of which will be retained by the Owner or their appointed representative. Submit one additional copy that will be returned to the Contractor. Alternatively, the Contractor may elect, with approval from the Owner or their appointed representative, to submit all paper submittals, manufacturer's literature, shop drawings, etc., electronically by using a third party FTP site.

2. The Contractor shall coordinate all submittals and review them for legibility, accuracy, completeness, and compliance with Contract requirements prior to submittal. Forward

submittals that are related to or affect one another as a package to facilitate a coordinated review by the Owner or their appointed representative. The Contractor shall provide evidence on the submittals that they have been reviewed, are complete, and have been approved for submission.

3. Submittals will not be accepted for review if identification is missing, an incorrect amount of submittals is submitted, the transmittal cover letter is incorrectly filled out, submittals are not coordinated, or submittals do not show evidence of Contractor's approval.

4. The Owner or their appointed representative reserve the right to require submittals in addition to those called for in individual Specification Sections.

B. <u>Specific Procedures</u>:

1. Shop Drawings: Identify each copy of shop drawings with the Contract Drawing number in lower right hand corner.

2. Samples: Samples shall be large enough to clearly illustrate the functional characteristics and full range of color, texture, or patterns.

3. Manufacturer's Literature: Submit only pertinent pages and mark each copy of standard printed data to identify products referenced in individual Specification Sections.

C. <u>Owner or Appointed Representative Approval</u>:

1. The Owner or their appointed representative will indicate approval or disapproval of each submittal and the reasons for disapproval.

2. After the Owner's or their appointed representative's review is complete, revise and resubmit if the submittal is disapproved. Provide three copies of the resubmittal and identify changes made since the previous submittal.

3. When the Owner or their appointed representative has approved submittals, the Contractor's copy will be returned. Any work done prior to approval shall be at Contractor's own risk.

1.5 APPROVED EQUALS

A. For each item proposed as an "approved equal", submit a separate request. With each request, submit supporting data, including:

1. Drawings and samples, as appropriate.

2. Comparison of the qualities of the proposed item with that specified.

3. Changes required in other elements of the work because of the substitution.

4. Name, address, and telephone number of the vendor.

5. Manufacturer's literature regarding installation, operation, and maintenance, including schematics for electrical and hydraulic systems, lubrication requirements, and parts lists.

6. Describe the availability of maintenance services and state the source of replacement materials.

B. A request for approval constitutes a representation that the Contractor:

1. Has investigated the proposed item and determined that it is equal to or superior in all respects to the product specified.

2. Will provide the same warranties for the proposed item as for the item specified.

3. Has determined that the proposed item is compatible with interfacing items.

4. Will coordinate the installation of an approved item and make all changes required in other elements of the work because of the substitution.

5. Waives all claims for additional expenses that may be incurred because of the substitution.

1.6 MANUFACTURER’S INSTALLATION INSTRUCTIONS

When Contract Documents require compliance with the manufacturer’s printed instructions, provide one complete set of instructions for the Owner or their appointed representative as part of the submittal and keep another complete set of instructions at the project site until substantial completion.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01 45 23

TESTING AND INSPECTING SERVICES (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

A. Testing shall include all labor, equipment, and materials associated with all tests required by this Contract including, but not limited to, tests for existing soil conditions, soil and material compactions, and product, concrete, and aggregate analyses using standard accepted tests, methods, and equipment.

B. Contractor Responsibilities:

1. Select the testing laboratory to be used for all testing under this Contract.
2. Arrange for the collection of samples, product data, and delivery of results.
3. Provide inspection services of the work for quality control.

1.2 SUBMITTALS

A. Copies of all test and inspection reports shall be provided to the Owner or their appointed representative for approval as specified in the individual Specification Sections.

B. Submit qualifications of the testing laboratory for approval prior to performing any required testing under this Contract.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for final cleanup, closeout submittals, final inspection procedures, and as-built drawings.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.1 CLEANING

Remove all tools, equipment, surplus materials, and rubbish prior to final inspection. Leave the project site thoroughly clean and ready for use.

3.2 PROJECT RECORD/AS-BUILT DRAWINGS

A. Contractor is responsible for preparing project record/as-built drawings. Changes shall be made using colored ink on a set of clean prints of original tracings. All changes and revisions to the original design that affect the permanent structures and will exist in the completed work shall be shown. Underground utilities to semi-permanent or permanent physical objects and water, sewer, telephone, and electric lines shall be referenced.

B. "Record Drawings" shall be indicated on each of the drawings submitted.

C. Record drawings shall be kept current, and inspections shall be made monthly. Certification of accuracy and completeness will be required on monthly payment requisitions. Project record drawings are the property Owner's property, which shall be delivered to the Owner or their appointed representative before project closeout.

3.3 INFORMATION ON RECORD/AS-BUILT DRAWINGS

Provide the following minimum information on the drawings:

A. Topographic information identifying the dredging within the lake area, excavation of the forebay pond, excavation of existing embankment, placement of embankment fill, grading adjacent to concrete structures, drainage channels, fill disposal areas and tie-in to existing ground.

B. Elevations and locations of riprap, articulated concrete revetment, concrete, edges of lake and forebay pond, drainage appurtenances and above and below ground piping installed or abandoned.

C. Topographic information identifying borrow area excavation, if located on-site.

D. Locations and elevations of concrete structures, joints, waterstops, weep holes, drainage outlets.

E. Limits of revegetation

3.4 CLOSEOUT SUBMITTALS

Submit the following items before the final inspection request:

A. Project Record Drawings: As specified above.

B. Guarantees and Bonds: As specified in individual Specification Sections or as required by the Contract.

3.5 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

Contractor shall submit written certification that the project is substantially complete and request in writing a final inspection. Owner or their appointed representative will make an inspection within 10 calendar days after receipt of request.

A. When the Owner or their appointed representative determines that the work is substantially complete, a list of deficiencies will be prepared that must be corrected before final acceptance and issuance of a Letter of Substantial Completion is made.

B. If the Owner or their appointed representative determines that the work is not substantially complete, the Contractor will immediately be notified in writing. Resubmit certification and request a new final inspection after completing the work listed by the Owner or their appointed representative.

3.6 ACCEPTANCE OF THE WORK

After all deficiencies have been corrected, a Letter of Acceptance will be issued.

3.7 POST-CONSTRUCTION INSPECTION

Before expiration of the warranty period, the Owner or their appointed representative will inspect the project site and notify the Contractor in writing of all deficiencies.

END OF SECTION

SECTION 02 41 00

DEMOLITION, DECONSTRUCTION AND DEWATERING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for demolition and deconstruction of materials and equipment to be performed under this Contract, including removal, salvage, reinstallation, and/or disposal. It also addresses the requirements for dewatering of the lake and for routing and control of streamflow around the dewatered lake area.

1.2 REFERENCES

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

ASTM INTERNATIONAL (ASTM)

ASTM A 48/A 48M	(2003; R 2012) Standard Specification for Gray Iron Castings
ASTM A 536	(1984; R 2009) Standard Specification for Ductile Iron Castings
ASTM B 26/B 26M	(2012) Standard Specification for Aluminum-Alloy Sand Castings
ASTM C 150/C 150M	(2011) Standard Specification for Portland Cement
ASTM C 231/C 231M	(2010) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT)

PENNDOT PUB 408	(2011) Specifications
PENNDOT PUB 72M	(2010) Standards for Roadway Construction

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants

1.3 SUBMITTALS

A. Contractor shall submit Demolition and Deconstruction Plan, including proposed demolition, deconstruction, salvage, and removal procedures, for approval prior to starting demolition and deconstruction operations. The plan shall include procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a detailed description of methods and equipment to be used for each operation, sequence of operations, and means and methods for maintaining stability and condition of existing structures to remain.

B. If necessary or requested by the Owner's representative, submit calculations prepared by a licensed professional engineer registered in the Commonwealth of Pennsylvania demonstrating that the portions of existing structure to remain, as shown on the Drawings, will be stable during and after demolition, deconstruction, and construction operations prior to backfilling within the existing spillway area. The calculations shall be reviewed by the Owner or their appointed representative prior to beginning demolition or deconstruction operations.

C. If necessary or requested by the Owner's representative, submit calculations prepared by a licensed professional engineer registered in the Commonwealth of Pennsylvania for all temporary sheeting, shoring, or bracing systems used to support existing structures to remain undisturbed for review by the Owner or their appointed representative prior to beginning demolition or deconstruction operations.

D. Contractor shall submit timely notification of demolition and deconstruction projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA), Pennsylvania Department of Environmental Protection, local air pollution control district/agency, and the Owner or their appointed representative in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M.

E. Contractor shall submit results of the existing conditions survey for approval prior to beginning demolition or deconstruction activities.

F. The Contractor shall submit a dewatering plan to Owner or their appointed representative for approval prior to beginning the work. The dewatering plan shall provide the equipment and procedures to be used for dewatering/drawdown of the lake. It shall also provide the procedures for reducing sediment in the dewatered discharge and the location of existing or proposed appurtenances where lake water will be discharged. It shall also identify any permits and the procedures to be used for routing streamflow around the dewatered area.

1.4 PROJECT DESCRIPTION

Do not begin demolition or deconstruction until authorization is received from the Owner or their appointed representative. The work includes demolition, deconstruction, salvage, and removal of resulting rubbish and debris. Remove rubbish and debris from the project site daily; do not allow accumulations, unless otherwise directed or approved by the Owner or their appointed representative. Store materials in areas specified by the Owner or their appointed representative, which cannot be removed daily from the project site. In the interest of occupational safety and health, perform the work in accordance with applicable OSHA safety standards. The Contractor shall adhere to the surcharge, stability, and condition restrictions of the existing embankment as shown on the Drawings. Any damage to existing structures as a direct result of the Contractor's demolition, deconstruction, or construction operations shall be repaired or replaced to the satisfaction of the Owner at no additional expense.

1.5 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing structures, select species of trees, utilities, and site features to remain in place (undisturbed), to be reused, or to remain the property of the Owner. Repair or replace damaged items as approved by and to the satisfaction of the Owner or their appointed representative. Coordinate the work of this Section with all other work indicated. Design, construct or install, and maintain temporary sheeting, shoring, or bracing systems, or temporary buttressed fill materials as required. Ensure that structural elements to remain are not overloaded and meet the requirements shown on the Drawings. Increase structural support or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this Contract. Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Owner or their appointed representative prior to performing such work.

1.5.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary sheeting, shoring, or bracing systems, or temporary buttressed fill material for support of components of the embankment or other existing structures to prevent settlement, sliding, or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove snow, dust, dirt, and debris from work areas daily.

1.5.2 Trees

Protect trees within the project site which may be damaged during demolition or deconstruction, and are indicated to be left in place, by 4 foot high fluorescent safety fence or other approved materials. Erect and secure the fence a minimum of 4 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this Contract in kind or as approved by the Owner or their appointed representative.

1.5.3 Utility Service

Maintain existing utilities indicated to remain undisturbed and stay in service, and protect against damage during demolition, deconstruction, and construction operations.

1.6 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted, unless approved by the Owner and performed in accordance with applicable Municipal requirements.

1.7 QUALITY ASSURANCE

Comply with Federal, State, and local hauling and disposal regulations. In addition to the requirements of these Specifications, conform to the safety requirements contained in ASSE/SAFE A10.6. Comply with the USEPA requirements specified. Use of explosives will not be permitted.

1.8 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of debris.

1.9 PROTECTION

1.9.1 Barricades

Where safety is endangered in the area of removal work, install traffic barricades with optional flashing lights. Anchor barricades in a manner to prevent displacement by wind. Notify the Owner or their appointed representative prior to beginning such work.

1.9.2 Protection of Personnel

Before, during, and after the demolition and deconstruction work, continuously evaluate the condition of the structure being demolished or deconstructed and take immediate action to protect all personnel working in and around the project site.

1.10 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Owner or their appointed representative at no additional expense to the Owner.

1.11 EXISTING CONDITIONS

Before beginning any demolition or deconstruction work, survey the site and examine the Drawings and Specifications to determine the extent of the work. Record existing conditions in the presence of the Owner or their appointed representative in accordance with Section 01 11 00 SUMMARY OF WORK.

PART 2 – PRODUCTS

2.1 BUTTRESS MATERIAL

Material used for buttressed soil against existing structures for stability shall be satisfactory material or structural cohesive fill in accordance with Section 31 00 00 EARTHWORK.

2.2 GROUT MATERIAL

Grout material used for pipe filling shall meet the requirements of Section 31 23 23.33 FLOWABLE FILL.

PART 3 – EXECUTION

3.1 EXISTING FACILITIES

Inspect and evaluate existing structures, materials, and assemblies onsite for reuse or salvage. Existing construction scheduled to be removed for reuse or salvage shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, salvage, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse or salvage onsite whenever possible.

3.1.1 Structures

The major structures indicated on the Drawings for full or partial demolition or deconstruction shall include, but are not limited to, the existing concrete steps at the perimeter of the lake, the concrete bypass channel, outlet structure and discharge pipe at the northwest corner of the existing lake, an existing active waterline, a retaining wall, light poles and utility poles, gravel and asphalt pedestrian trails and a concrete slab bridge.

A. The Contractor shall remove existing structures in their entirety. Demolition of structures in their entirety shall include, but not be limited to, removal and salvage or disposal of all concrete footings, slabs, walls, and weirs, granular backfill and filter materials, and materials that are not satisfactory for reuse in accordance with Section 31 00 00 EARTHWORK.

B. Demolish and deconstruct structures in a systematic manner from the top of the structure to the ground. Complete demolition and deconstruction work of the walls and weirs before the slabs and footings are disturbed. Demolish and deconstruct concrete walls in small sections.

C. Sawcut, remove, and breakdown concrete walls, weirs, slabs, and foundations in their entirety into sizes required for proper handling and disposal. Concrete shall be removed from the project site and disposed of at a properly permitted disposal facility at the Contractor's expense, or reused in accordance with paragraph “Disposition of Material”. Concrete to be reused shall be moved, ground, and stored as directed by the Owner or their appointed representative.

D. Granular backfill and filter materials removed during demolition of the existing concrete weir, spillway chute, and stilling basin shall be examined by the Contractor and the Owner or their appointed representative for reuse as satisfactory fill. Materials determined to be in sound condition, not clogged, and satisfactory shall be separated and reused in areas corresponding to placement areas of similar material. If the materials are satisfactory, they shall be placed in accordance with the requirements of these Contract Specifications. If the materials are determined not satisfactory for reuse, the materials shall be removed from the project site for legal disposal at a properly permitted disposal facility.

E. Unsatisfactory materials defined in Section 31 00 00 EARTHWORK removed during demolition or deconstruction shall be removed from the project site for legal disposal at a properly permitted disposal facility

3.1.2 Utilities and Related Equipment

Do not interrupt existing utilities serving occupied or used facilities. Do not interrupt existing utilities serving facilities occupied and used by the Owner, except when approved in writing and then only after temporary utility services have been approved and provided.

3.1.3 Light Poles, Pedestals and Conduit

A. Remove light fixture and disconnect light pole from pedestal. Salvage light pole at location designated by Owner or appointed representative. Remove conduit and wiring extending between each pole. Consider all conduit and wiring as scrap. Demolish and remove each light pole pedestal. Consider anchor bolts and bolts as scrap. Locate source of electrical power to the light poles and disconnect in a manner that does not interfere with other electrical power distribution. Perform work in accordance with applicable electrical codes.

3.1.4 Existing Active Waterline

B. The existing 15-inch waterline located beneath the existing and proposed earthen embankment shall be abandoned as shown on the Drawings. The Contractor shall coordinate with the Pittsburgh Water and Sewer Authority to terminate service in the line prior to abandonment.

C. A new waterline shall be installed in accordance with Section 33 40 00 STORM DRAINAGE UTILITIES.

3.2 CONCURRENT EARTH MOVING OPERATIONS

Do not begin excavation, fill placement, and other earth moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Only buttressed fill material required for existing structure stability will be allowed to be placed adjacent to structures to remain undisturbed.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title of Materials

Except for materials or equipment scheduled for reuse or salvage, all materials and equipment removed shall become the property of the Contractor and shall be removed from the project Site. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Owner or their appointed representative of the Contractor's demolition, deconstruction, salvage, and removal procedures, and authorization by the Owner or their appointed representative to begin demolition and deconstruction. The Owner or their appointed representative will not be responsible for the condition or loss of, or damage to, such property after Contract award. Showing for sale or selling materials and equipment onsite is prohibited.

3.3.2 Reuse of Materials

Remove and store materials listed in the Demolition and Deconstruction Plan and shown on the Drawings to be reused or relocated to prevent damage, and reinstall as the work progresses. Items to be reused or relocated include, but are not limited to, the following:

A. Concrete removed during demolition or deconstruction activities may be reused as riprap where it could be covered with a full layer of the specified riprap to bring the final grade to the thicknesses shown on the Drawings. Concrete that is reused as riprap shall be placed in such a manner to “interlock” with adjacent pieces of concrete and riprap. To use the concrete rubble, the steel reinforcement shall be cut off so no steel is protruding from the concrete. The concrete shall be broken down and screeded to the gradations required by the Specifications for the intended riprap. Use of concrete as riprap shall be at the Contractor's expense at no additional cost to the Owner. Concrete that cannot be broken down into the proper gradations and used as riprap shall become the property of the Contractor and shall be removed from the project site.

B. Concrete removed during demolition or deconstruction activities may be reused by the Owner for miscellaneous maintenance needs. The concrete shall be broken down and screeded to the gradations identified by the Owner and stored at a location designated by the Owner.

3.3.3 Salvaged Materials

Remove materials that are listed in the Demolition and Deconstruction Plan, shown on the Drawings, and are specified to be removed by the Contractor and that are to remain the property of the Owner, and deliver to a storage site designated the Owner or their appointed representative, unless the reinstallation is completed within the same day.

A. Salvage items and material to the maximum extent possible.

B. Store all materials salvaged for the Contractor as approved by the Owner or their appointed representative and remove from the project site before completion of the Contract. Onsite sale of salvaged material is prohibited.

C. Remove salvaged items to remain the property of the Owner in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers.

3.4 LAKE DEWATERING/DRAWDOWN

Prior to beginning construction, the Contractor shall be required to coordinate a temporary construction drawdown with the Owner. Panther Hollow Lake shall be dewatered/drawn down to an elevation at or below 801 feet. The purpose of the temporary drawdown is to allow excavation operations to be performed in the dry. The Contractor may begin work on the temporary construction facilities prior to or during the drawdown. The temporary drawdown shall be coordinated with the Owner or their appointed representative a minimum of 30 days in advance of performing the drawdown. The Contractor shall schedule the drawdown so that completion of the drawdown does not interfere with the construction schedule. Following lake dewatering/drawdown, the Contractor shall be responsible for maintaining a dewatered area in accordance with Section 31 00 00 EARTHWORK to facilitate the lake soil excavation and construction of the lake, forebay, embankment raise, and any other ancillary components.

3.5 PIPE GROUTING

Grout pipes in accordance with Section 31 23 23.33 FLOWABLE FILL

3.6 STREAM REROUTING

Following lake dewatering/drawdown, the Contractor shall temporarily dam or berm the streamflow from Phipps Run and Panther Hollow Run and rout the flow around the dewatered lake area and the proposed location of the forebay pond. An existing channel is available on th north side of the lake to direct flow. The channel may be modified with fill as need to increase the channel capacity. The base flow for the two streams is approximately 10 cubic feet per second. The contractor shall construct a dam or berm to rout this flow and shall provide additional dam or berm height or pumping at his discretion to rout flow from a storm event that increases base flow.

3.7 CLEANUP

Remove debris and rubbish from excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply Federal, State, and local regulations regarding hauling and disposal.

3.8 DISPOSAL OF REMOVED MATERIALS

3.8.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from demolition and deconstruction operations in accordance with all applicable Federal, State, and local regulations.

3.8.2 Removal from the Project Site

Transport waste materials removed from demolished and deconstructed structures from the project site for legal disposal at a properly permitted disposal facility.

END OF SECTION

SECTION 02 57 00

STORM WATER POLLUTION CONTROL

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all temporary and permanent storm water pollution control measures to be installed under this Contract.

1.2 REFERENCES

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 181	(2010) Standard Specification for Chain Link Fence
AASHTO MP-9	(2006) Standard Specification for Compost

ASTM INTERNATIONAL (ASTM)

ASTM D 1004	(2009) Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
ASTM D 1505	(2010) Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D 1603	(2012) Standard Test Method for Carbon Black Content of Olefin Plastics
ASTM D 3083	(1989) Specification for Flexible Poly (Vinyl Chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining
ASTM D 3776/D 3776M	(2009ae2) Standard Test Methods for Mass per Unit Area (Weight) of Fabric
ASTM D 3786/D 3786M	(2009) Standard Test Method for Bursting Strength of Textile Fabrics – Diaphragm Bursting Strength Tester Method
ASTM D 4355	(2007) Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus
ASTM D 4439	(2004) Standard Terminology for Geosynthetics
ASTM D 4491	(1999a; R 2009) Standard Test Methods for Water Permeability of Geotextiles by Permittivity

ASTM D 4533	(2011) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(2008) Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(2004) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D 4833	(2007) Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
ASTM D 4873	(2002; R 2009) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D 4884	(2009) Standard Test Method for Strength of Sewn or Thermally Bonded Seams of Geotextiles
ASTM D 5199	(2012) Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 503	Standards for the Use or Disposal of Sewage Sludge

1.3 SUBMITTALS

A. Submittals for stone, aggregate, and geotextile referenced in other Sections of these Specifications shall be in accordance with the requirements of the applicable Specification Section.

B. Submit product data or manufacturer's technical literature for all erosion and sediment control measures for approval prior to furnishing onsite.

C. Submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified herein. Specify in the mill certificate or affidavit, the actual Minimum Average Roll Values and identify the fabric supplied by roll identification numbers.

D. Submit certificates of compliance for all erosion and sediment control measures stating the materials are in compliance with all the specified requirements of these Contract Specifications.

1.4 SYSTEM DESCRIPTION

The work consists of implementing the storm water pollution prevention measures to prevent sediment from entering streams or water bodies as specified in this Section, in conformance with the requirements of the National Pollutant Discharge Elimination System (NPDES), and as shown on the Drawings.

1.5 EROSION AND SEDIMENT CONTROLS

The controls and measures required of the Contractor are described below.

1.5.1 Stabilization Practices

The stabilization practices to be implemented include, but are not limited to, temporary seeding, mulching, slope preparation, geotextiles, protection of trees, preservation of mature vegetation, etc. Record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, and grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in paragraphs "Unsuitable Conditions" and "No Activity for Less than 21 Days", initiate stabilization practices as soon as practicable, but no more than 14 days, in any portion of the site where construction activities have temporarily or permanently ceased.

1.5.1.1 Unsuitable Conditions

Where the initiation of stabilization measures by the fourteenth day after construction activity temporarily or permanently ceases or is precluded by unsuitable conditions caused by the weather, initiate stabilization practices as soon as practicable after conditions become suitable.

1.5.1.2 No Activity for Less Than 21 Days

When the total time period in which construction activity is temporarily ceased on a portion of the site is 21 days minimum, stabilization practices do not have to be initiated on that portion of the site until 14 days have elapsed after construction activity temporarily ceased.

1.5.1.3 Burnoff

Burnoff of the ground cover is not permitted.
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1.5.1.4 Protection of Erodible Soils

Complete final grading of surface s with erodible soils, as indicated on the Drawings or specified, and protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

1.5.2 Structural Practices

Implement structural practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Implement structural practices in a timely manner, during the construction process, to minimize erosion and sediment runoff. Include the following devices; the location and details of installation and construction are shown on the Drawings.

1.5.2.1 Filter Fabric Fences and Filter Sock

Provide filter fabric fences or filter sock as a temporary structural practice to minimize erosion and sediment runoff. Properly install filter fabric fences or filter sock to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g., clearing and grubbing, excavation, and grading).

1.5.3 Swales and Ditches

Build swales and ditches to adequately convey the permanent flow from adjacent drainage areas and have the appropriate lining and dimensions shown on the Drawings.

1.5.4 Rock Construction Entrances

Provide and install rock construction entrances as shown on the Drawings to limit the migration of dirt and debris onto paved roadways.

1.5.5 Pumped Water Filter Bags

Provide and install pumped water filter bags as necessary as shown on the Drawings to filter pumped water from disturbed areas prior to discharging to receiving waters.

1.5.6 Concrete Washout Facilities

Provide and install concrete washout facilities as necessary as shown on the Drawings to clean chutes, mixers, and hoppers of the delivery vehicles at the project site.

1.5.7 Vegetation and Mulch

A. Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, or mulching. Stabilize slopes by hydroseeding, anchoring mulch in place, or such combination of these and other methods necessary for effective erosion control.

B. Provide new seeding where earth is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass. The seeding operation shall be as specified in Section 32 92 19 SEEDING. Erosion control blankets required for steep slopes or near surface waters shall be as specified in Section 31 25 14 EROSION CONTROL BLANKETS.

1.6 DELIVERY, STORAGE, AND HANDLING

Identify, store, and handle filter fabric in accordance with ASTM D 4873.

PART 2 – PRODUCTS

2.1 FILTER FABRIC FENCES

2.1.1 Filter Fabric

Provide geotextile that complies with the requirements of ASTM D 4439, and consists of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and contains stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. Provide synthetic filter fabric that contains ultraviolet ray inhibitors and stabilizers to assure a minimum of six months of expected usable construction life at a temperature range of 0 degrees F to 120 degrees F. The filter fabric shall meet the following requirements:

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile Elongation	ASTM D 4632	100 Pounds Minimum; 30 Percent Maximum
Trapezoid Tear	ASTM D 4533	55 Pounds Minimum
Permittivity	ASTM D 4491	0.2 Seconds^{-1}
Apparent Opening Size	ASTM D 4751	20 to 100 (U.S. Standard Sieve)

2.1.2 Stakes and Posts

2.1.2.1 Standard Filter Fabric Fence

Use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for filter fabric fence construction shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and have a minimum length of 3 feet. Steel posts (standard "U" or "T" sections) utilized for filter fabric fence construction shall have a minimum weight of 1.33 pounds per linear foot.

2.1.3 Fasteners

2.1.3.1 Standard Filter Fabric Fence

Fasteners for attaching fabric fence to support stakes shall be No. 9 staples, 1-1/2 inches long, or 17 gage galvanized steel tie wires of appropriate length.

2.2 SWALES AND DITCHES

Drainage swales and ditches shall be constructed in existing soils and possess the necessary gradation and soil classification to convey flow. Seeding shall be in accordance with Section 32 92 19 SEEDING.

2.3 ROCK CONSTRUCTION ENTRANCES

2.3.1 Aggregate

Aggregates for the rock construction entrances shall be AASHTO No. 1 aggregate in accordance with Section 31 05 16 AGGREGATES FOR EARTHWORK, including quality and gradation requirements.

2.3.2 Geotextile

Geotextile for the rock construction entrances shall be woven geotextile in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK.

2.4 PUMPED WATER FILTER BAGS

2.4.1 Geotextile

Pumped water filter bags shall be made from nonwoven geotextile material having the following properties and shall have minimum dimensions of 15 feet long by 15 feet wide. Bags shall be capable of trapping particles larger than 150 microns. Label each bag indicating maximum flow rate in gallons per minute. Provide bags with lifting straps of sufficient strength to support the weight of the bag.

MINIMUM PHYSICAL REQUIREMENTS FOR NONWOVEN GEOTEXTILE			
PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
Weight	OZ/SY	10	ASTM D 3776/D 3776M
Grab Tensile Strength	LBS	250	ASTM D 4632
Trapezoidal Tear Strength	LBS	100	ASTM D 4533
Puncture Resistance	LBS	155	ASTM D 4833
Mullen Burst Strength	PSI	430	ASTM D 3786/D 3786M
Ultraviolet Degradation	Percent Retained	70 at 500 Hrs.	ASTM D 4355
Maximum Apparent Opening Size	U.S. Sieve	100	ASTM D 4751

2.4.2 Seams

Seams shall be sewn with high strength, double stitched "J" type seams with a minimum strength of 100 pounds per inch in accordance with ASTM D 4884.

2.4.3 Accessories

Provide all pumps, hoses, clamps, and incidentals required for pumping water from the water source to the pumped water filter bag locations. Provide each bag with an adjustable sewn-in spout capable of handling a maximum hose size of 6 inches.

2.5 CONCRETE WASHOUT FACILITIES

2.5.1 Compost Filter Sock

Compost filter sock shall be high-density polyethylene expandable, tubular, biodegradable, or photodegradable, 3 mils to 5 mils, 3/8 inch nominal mesh netting fabric sock of 18 inch or 24 inch diameters.

2.5.2 Compost

Compost shall be well-decomposed, stable, weed-free, organic compost meeting AASHTO MP-9 derived from a variety of feed stocks including agricultural, forestry, food, or industrial residuals; bio-solids (treated sewage sludge); leaf and yard trimmings; manure; or tree wood with no objectionable odors or substances toxic to plants. Material may be aerobically composted at a Pennsylvania Department of Environmental Protection, Bureau of Waste Management, permitted site and conforming to 40 CFR 503. Test compost in accordance with U.S. Composting Council’s Test Methods for Examining of Composting and Compost (TMECC). Provide compost with the U.S. Composting Council’s Seal of Testing Assurance Program (STA) certification and STA product label. Compost having the following physical properties based on TMECC Test Methodologies:

PROPERTY	ACCEPTABLE VALUES
Moisture Content, Dry Mass (Weight) Basis	30 to 60 Percent
pH	5.5 to 8.5
Maximum Soluble Salt Concentration (Electrical Conductivity)	5.0 dS/m
Manmade Inert Contaminants, Dry Mass (Weight) Basis	Less Than 1 Percent
Organic Matter Content, Dry Mass (Weight) Basis	25 to 65 Percent
Particle Size, Percent Passing Mesh Size, Dry Mass (Weight) Basis: Material Passing 3 Inches Material Passing 2 Inches Material Passing 5/8 Inch Material Passing 3/8 Inch	 100 Percent 99 Percent 95 Percent 30 Percent Minimum to 70 Percent Maximum
Acceptable General Particle Size	1/2 Inch to 2 Inches; 6 Inches Maximum Particle Length

2.5.3 Wood Chips

Untreated wood chips less than or equal to 5 inches in length with 95 percent passing a 2 inch screen and less than 30 percent passing a 1 inch screen.

2.5.4 Stakes

Wooden stakes shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and have a minimum length of 3 feet.

2.5.5 Impervious Geomembrane

Impervious geomembrane shall be fabricated of high-density polyethylene in conformance with the following requirements:

PROPERTY	TEST METHOD	ACCEPTABLE VALUES
Density	ASTM D 1505	59 Pounds per Cubic Foot Minimum
UV Stabilization	ASTM D 1603	2 Percent Carbon Black
Sheet Thickness	ASTM D 5199	30 Mils Minimum
Tear Resistance	ASTM D 1004	22 Pounds
Resistance Soil Burial	ASTM D 3083	90 Percent Retained Strength
Minimum Roll Width		20 Feet Minimum

2.5.6 Prefabricated Washout Containers

In lieu of compost filter sock washout facilities, prefabricated washout containers may be used. The containers shall be as intended by the manufacturer for use as a concrete washout facility. Containers shall be watertight and appropriately sized. Accumulated materials must be disposed of at a properly permitted disposal facility or recycled when the specified cleanout level has been reached. Prefabricated washout containers must be approved prior to furnishing onsite.

PART 3 – EXECUTION

3.1 INSTALLATION OF FILTER FABRIC FENCES

Excavate trench and install fence posts. Fasten the geotextile and wire fabric, as applicable, securely at the maximum spacings shown on the Drawings. Keep sag to a minimum. Extend the geotextile into the excavated trench as indicated on the Drawings, backfill the trench with the excavated soil, and compacted over the fabric to the density of the surrounding soils. Provide filter fabric from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, splice together filter fabric at a support post, with a minimum 6 inch overlap securely sealed.

3.2 CONSTRUCTION OF SWALES AND DITCHES

Excavation and grading of drainage swales and ditches shall be performed in accordance with Section 31 00 00 EARTHWORK. Swales shall be seeded in accordance with Section 32 92 19 SEEDING. Where slopes require, install erosion control blankets in accordance with Section 31 25 14 EROSION CONTROL BLANKETS.

3.3 CONSTRUCTION OF ROCK CONSTRUCTION ENTRANCES

Construct the rock construction entrances by performing excavation in accordance with Section 31 00 00 EARTHWORK. Place geotextile and aggregate in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK and Section 31 05 16 AGGREGATES FOR EARTHWORK, respectively. Provide satisfactory drainage through the rock construction entrance. When the construction entrance is no longer required, remove the entrance and restore the area to preconstruction conditions to the satisfaction of the Owner or their appointed representative.

3.4 INSTALLATION OF PUMPED WATER FILTER BAGS

Install pumped water filter bags, as required or directed, in accordance with the details shown on the Drawings and as specified herein. Place pumped water filter bags on a well vegetated, stabilized area such that discharge from bag will not flow over any disturbed areas or back into the project site. Provide a geotextile underlayment lined flow path if a stabilized flow path is not possible. Locate bags on level areas. Place a layer AASHTO No. 57 aggregate to level the bag where an uneven ground surfaces exist. Do not install bags on slopes steeper than 5 percent. Do not exceed a pump rate of 750 gallons per minute or half the maximum specified by the manufacturer, whichever is less. Insert hose into sewn-in spout and double clamp the bag firmly to the pump discharge hose. Do not install more than one pump hose into a single bag. Do not cut open bags and seed. Restore areas where pumped water filter bags and appurtenances are placed to preconstruction conditions to the satisfaction of the Owner or their appointed representative.

3.5 CONSTRUCTION OF CONCRETE WASHOUT FACILITIES

Install concrete washout facilities, as required or directed, in accordance with the details shown on the Drawings and as specified herein. Compost filter socks and impervious geomembrane shall be installed in accordance with the manufacturer's written recommendations. Concrete washout facilities shall be installed in a location convenient for the concrete trucks. The location shall preferably be near the concrete placement location, but far enough from other vehicular traffic to minimize the potential for accidental damage or spills. Concrete washout facilities shall not be placed within 50 feet of storm drains, open ditches, or surface waters.

3.6 INSPECTION AND MAINTENANCE REQUIREMENTS

Unless otherwise indicated on the Drawings or specified herein, all erosion and sediment control measures shall inspected by the Contractor after each runoff event and on a weekly basis until the project site has become stabilized. All preventative and remedial maintenance work, including, but not limited to, clean out, repair, replacement, regarding, reseeding, and remulching, must be performed immediately after inspection. If the erosion and sediment control measures fail to perform as expected, the Contractor shall replace or modify the installed temporary control measures to satisfactory operating condition. Any area failing to establish permanent stabilization shall be reseeded and remulched in accordance with these Specifications.

3.6.1 Filter Fabric Fences

After filter fabric fence installation, satisfactorily maintain the fence. Periodically clean filter fabric fences by tapping the dry geotextile from the downstream side. Sediment shall be removed from filter fabric fences by the Contractor when accumulations reach half the above ground height of the fence. Any section of fence that has been undermined or topped shall be immediately replaced with a rock filter outlet.

3.6.2 Swales and Ditches

The Contractor shall inspect swales for areas that have failed to establish a vegetative cover and shall reseed, remulch, and maintain these areas until a vegetative cover has been established. The Contractor shall inspect rock lined ditches for accumulated sediment and shall remove the sediment when the rock lining is no longer visible in the ditch invert.

3.6.3 Rock Construction Entrances

The thickness of rock construction entrances shall be consistently maintained by the Contractor to the specified dimensions by placing additional aggregate as required. The Contractor shall stockpile aggregate at the project site for the purpose of maintaining the rock construction entrances. All sediment deposited on paved roadways shall be removed daily by the Contractor and returned to the project site.

3.6.4 Pumped Water Filter Bags

Monitor and evaluate the entire pumping operation to assure that the bag continues to function properly. Replace bags when contained silt reduces flow to approximately 50 percent of the rate of initial bag discharge, when the bags become half full, or when directed. Dispose of bags and sediment offsite at a properly permitted disposal facility.

3.6.5 Concrete Washout Facilities

Concrete washout facilities shall be monitored daily and damaged or leaking facilities shall be deactivated and repaired or replaced immediately upon inspection. Accumulated materials shall be removed from concrete washout facilities by the Contractor when accumulations reach 50 percent capacity for compost filter sock washout facilities or 75 percent capacity for prefabricated washout containers, unless otherwise recommended by the prefabricated washout container manufacturer.

END OF SECTION

SECTION 03 11 13

STRUCTURAL CAST-IN-PLACE CONCRETE FORMING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements of all formwork for structural cast-in-place concrete to be installed by the Contractor under this Contract, unless otherwise specified.

1.2 REFERENCES

ACI INTERNATIONAL (ACI)

ACI 117	(2010) Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 301	(2010) Specifications for Structural Concrete
ACI 347	(2004; Errata 2008) Guide to Formwork for Concrete

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA PS 1	(1995) Voluntary Product Standard for Construction and Industrial Plywood

ASTM INTERNATIONAL (ASTM)

ASTM C 1077	(2011b) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 31/C 31M	(2010) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 39/C 39M	(2011) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

1.3 SYSTEM DESCRIPTION

The design, engineering, construction, and maintenance of the formwork shall be the responsibility of the Contractor and shall be performed in accordance with ACI 301. Design formwork in accordance with the methodology of ACI 347 for anticipated loads, lateral pressures, and stresses. Formwork shall be capable of withstanding the pressures resulting from placement and vibration of concrete. Comply with the tolerances specified and limit concrete surface irregularities in accordance with ACI 347. For surfaces with a Class A surface designation, limit the allowable deflection to 0.0025 times the span. Design the formwork as a complete system with consideration given to the effects of cementitious materials and mixture additives, such as fly ash, cement type, plasticizers, accelerators, retarders, air entrainment, and others. Monitor the adequacy of formwork design and construction prior to and during concrete placement.

1.4 SUBMITTALS

A. Contractor shall submit drawings showing details of formwork, including dimensions of joints, supports, studding and shoring, and sequence of form and shoring removal. If reshoring is permitted by the Owner or their appointed representative, the method, including location, order, and time of erection and removal shall be submitted.

B. Submit design analysis and calculations signed and sealed by a Registered Professional Engineer licensed within the United States for form design and methodology used in the design.

C. Submit manufacturer's data, including literature describing form materials, accessories, and form releasing agents.

D. Submit manufacturer's recommendation on the method and rate of application of form releasing agents.

E. Submit certificates stating the form materials and form releasing agents meet or exceed the requirements of these specifications.

F. Submit field inspection reports for concrete forms and embedded items.

PART 2 – PRODUCTS

2.1 FORMS FOR CLASS A FINISH

This class of finish shall apply to all exposed to view cast-in-place concrete. Forms for Class A finished surfaces shall be plywood panels conforming to APA PS 1, Grade B-B concrete form panels, Class I or II. Other form materials or liners may be used provided the smoothness and appearance of concrete produced will be equivalent to that produced by the plywood concrete form panels.

2.2 FORMS FOR CLASS D FINISH

This class of finish shall apply to all concrete surfaces against which backfill will be placed. Forms for Class D finished surfaces shall be wood, steel, or other approved concrete form material.

2.3 FORM TIES

Form ties shall be factory-fabricated metal ties of the internal disconnecting or snap-off type and shall be of a design that will not permit form deflection and will not spall the concrete upon removal. Provide solid backing for each tie. Ties shall not leave holes in the concrete surface less than 1/4 inch, nor more than 1 inch, deep and not more than 1 inch in diameter. Terminate the embedded portion of metal ties not less than 2 inches from any concrete surface exposed to water. Plastic snap ties shall not be used.

2.4 FORM RELEASING AGENTS

Form releasing agents shall be commercial formulations that will not bond with, stain, or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds. If special form liners are to be used, follow the recommendation of the form coating manufacturer.

2.5 CHAMFER STRIPS

Chamfer strips shall be wood, metal, polyvinyl chloride, or rubber strips sized accordingly to form the chamfers indicated on the drawings.

PART 3 – EXECUTION

3.1 INSTALLATION

Formwork shall be constructed true to the structural design and required alignment so that concrete members and structures are of the size, shape, alignment, elevation, and position indicated on the Drawings within the tolerances of ACI 117. Forms shall be mortar tight, properly aligned, and adequately supported to produce concrete surfaces meeting the surface requirements specified herein, as specified in Section 03 31 00 CAST-IN-PLACE STRUCTURAL CONCRETE. Continuously monitor the alignment and stability of the forms during all phases to assure the finished product will meet the required surface classes specified. Failure of any supporting surface either due to surface texture, deflection, or form collapse shall be the responsibility of the Contractor as will the replacement or correction of unsatisfactory surfaces. Where concrete surfaces are to have a Class A finish, joints in form panels shall be arranged as approved. When forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be reused if there is any evidence of defects which would impair the quality of the resulting concrete surface, including split, frayed, delaminated, or otherwise damaged. All surfaces of used forms shall be cleaned of mortar, fins, laitance, and any other foreign material before reuse. Form ties that are to be completely withdrawn shall be coated with a non-staining bond breaker.

3.2 CHAMFERING

All exposed joints, edges, and external corners shall be chamfered by molding placed in the forms, unless the Contract Drawings specifically state that chamfering is to be omitted or as otherwise specified. Chamfered joints shall not be permitted where backfill is placed in contact with concrete surfaces. Chamfered joints shall be terminated 12 inches outside the limit of the backfill so that the end of the chamfers will be clearly visible.

3.3 COATING

Forms for Class A finished surfaces shall be coated with a form releasing agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's printed or written instructions. Forms for Class D finished surfaces may be wet with water in lieu of coating immediately before placing concrete, except in cold weather with probable freezing temperatures the coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete. Reused forms shall receive a fresh coating of form releasing agent.

3.4 FORM REMOVAL

Forms shall not be removed without approval by Owner or his appointed representative. The minimal time required for concrete to reach strength adequate for removal of formwork without risking the safety of workers or the quality of the concrete depends on a number of factors including, but not limited to, ambient temperature, concrete lift heights, type and amount of concrete admixture, and type and amount of cementitious material in the concrete. It is the responsibility of the Contractor to consider all applicable factors and leave the forms in place until it is safe to remove them. In any case, forms shall not be removed unless the minimum time or minimum compressive strength requirements below are met, except as otherwise directed or specifically authorized. When conditions are such as to justify the requirement, forms will be required to remain in place for a longer period. All removal shall be accomplished in a manner which will prevent damage to the concrete and ensure the complete safety of the structure. Where forms support more than one element, the forms shall not be removed until the form removal criteria are met by all supported elements. Form removal shall be scheduled so that all necessary repairs can be performed as specified in Section 03 35 00 CONCRETE FINISHING, paragraph "Formed Surface Repair". Evidence that concrete has gained sufficient strength to permit removal of forms shall be determined by tests on control cylinders. All control cylinders shall be stored as near the structure as possible so they receive the same curing conditions and protection methods as given those portions of the structure they represent. Control cylinders shall be removed from the molds at an age of no more than 24 hours. All control cylinders shall be prepared and tested in accordance with ASTM C 31/C 31M and ASTM C 39/C 39M at the expense of the Contractor by an independent laboratory that complies with ASTM C 1077 and shall be tested within 4 hours after removal from the site.

3.4.1 Formwork Not Supporting Weight of Concrete

Vertical type formwork not supporting the weight of concrete shall not be removed in less than 24 hours after concrete placement is completed and cumulatively curing at not less than 50 degrees F. The stability of the concrete shall be evaluated by a Structural Engineer licensed within the United States prior to removal of the forms.

3.4.2 Formwork Supporting Weight of Concrete

Formwork supporting weight of concrete and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction or other superimposed loads to which the supported concrete may be subjected. As a minimum, forms shall be left in place until control concrete test cylinders indicate evidence the concrete has attained at least 70 percent of the compressive strength required for the structure in accordance with the quality and location requirements.

3.5 INSPECTION

Forms and embedded items shall be inspected in sufficient time prior to each concrete placement in order to certify to the Owner or their appointed representative that they are ready to receive concrete. The results of each inspection shall be reported in writing.

END OF SECTION

SECTION 03 15 00

CONCRETE ACCESSORIES (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all concrete accessories to be placed with the cast-in-place structural concrete under this Contract, unless otherwise specified. Concrete accessories shall include, but not be limited to, waterstops, joint materials, and sealants.

1.2 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM C 920	(2011) Standard Specification for Elastomeric Joint Sealants
ASTM D 1751	(2004; R 2008) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(2004a; R 2008) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 2240	(2005; R 2010) Standard Test Method for Rubber Property - Durometer Hardness
ASTM D 570	(1998; R 2010e1) Standard Test Method for Water Absorption of Plastics
ASTM D 5249	(2010) Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D 624	(2000; R 2007) Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D 638	(2010) Standard Test Method for Tensile Properties of Plastics
ASTM D 746	(2007) Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
ASTM D 747	(2010) Standard Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam

ASTM D 792	(2008) Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM F 594	(2009e1) Standard Specification for Stainless Steel Nuts

U.S. ARMY CORPS OF ENGINEERS (USACE)

CRD-C 572	(1974) Corps of Engineers Specifications for Polyvinylchloride Waterstops

1.3 SUBMITTALS

A. Contractor shall submit waterstop shop drawings and fabrication drawings, including details on intersections, changes in direction, and adhesive anchor assemblies, provided by the manufacturer or prepared by the Contractor for approval prior to manufacturing. Provide three examples of waterstop shop drawings from recent similar projects that were installed by the Contractor.

B. Submit joint layout shop drawings for all concrete joints required to construct the structures for approval, indicating the proposed joint type and locations**.** Include joint details approval.

C. Submit manufacturer's literature and recommended instructions, including safety data sheets, for preformed expansion joint fillers, field-molded sealants, bond breakers, and back-up material for approval prior to installation.

D. Submit manufacturer's literature and product data sheets for all waterstops and adhesive anchor assemblies, including instructions for installation and field splicing waterstops.

E. Submit certificates for all preformed expansion joint fillers, joint sealants, and waterstops stating the materials are in compliance with all the specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

Material delivered shall be protected and placed in storage off the ground from moisture, dirt, and other contaminants. Sealants shall be delivered in the manufacturer's original unopened containers. Sealants shall be removed from the project site if shelf life has expired. Waterstops shall be stored under tarps or other weather barriers to protect from moisture, oil, dirt, sunlight, and other contaminants.

PART 2 – PRODUCTS

2.1 PREFORMED EXPANSION JOINT FILLER

Expansion joint filler shall be preformed material conforming to ASTM D 1751 or ASTM D 1752. Filler material shall be of the thickness and width applicable for the joint formed.

2.2 SEALANT

Sealants shall be in accordance with ASTM C 920, Type M, Grade NS, Class 25, Use NT.

2.3 BOND BREAKER

Bond breaker material shall be polyethylene tape, coated paper, metal foil, or similar type materials.

2.4 BACK-UP MATERIAL

The back-up material shall be compressible, non-shrink, non-reactive with sealant, and non-absorptive material type, such as extruded butyl or polychloroprene rubber and shall be in accordance with ASTM D 5249.

2.5 SURVEY MARKERS

Survey markers shall be PK Nails, magnails, or survey discs, as selected by the Contractor and approved by the Owner or appointed representative. The survey marker shall be installed in accordance with the supplier's directions or by the surveyor using his professional experience obtained in similar installation conditions.

2.6 WATERSTOPS

Waterstops shall be embedded in concrete and span construction, contraction, and expansion joints to form a continuous diaphragm to prevent fluid migration through the concrete joints. Waterstops shall be flexible polyvinylchloride (PVC), shapes, profiles, types, and sizes as shown on the Drawings, and shall conform to the following properties. The PVC waterstop shall be extruded from an elastomeric plastic material manufactured from a prime virgin resin. The PVC compound shall not contain reclaimed or scrapped material or pigment. Intersection, corners, and change of direction waterstops shall be shop fabricated. The compound shall contain plasticizers, stabilizers, and other additives to meet the specified requirements. PVC waterstops shall conform to the requirements of CRD-C 572.

PROPERTY	TEST METHOD	NOMINAL VALUE
Water Absorption	ASTM D 570	0.15 Percent Max.
Tear Resistance	ASTM D 624	300 lb./in. Min.
Ultimate Elongation	ASTM D 638	350 Percent Min.
Tensile Strength	ASTM D 638	2,000 psi Min.
Low Temperature Brittleness	ASTM D 746	Pass at < -35 degrees F
Stiffness in Flexure	ASTM D 747	700 psi Min.
Specific Gravity	ASTM D 792	1.38 Max.
Hardness, Shore A	ASTM D 2240	79 ± 3
Tensile Strength After Accelerated Extraction	CRD-C 572	1,600 psi Min.
Elongation After Accelerated Extraction	CRD-C 572	300 Percent Min.
Effect of Alkalis After 7 days: Weight Change Hardness Change	CRD-C 572	 Between -0.10 and +0.25 Percent Plus or Minus 5 Points

PART 3 – EXECUTION

3.1 INSTALLATION

Joint locations and details, including materials and methods of installation of joint fillers and waterstops, shall be as specified and indicated on the Drawings. Construct joints true to line with faces perpendicular to the surface plane of the concrete. All joints shall be watertight to prevent the migration of water through the joints. Contractor shall design the watertight joints, including special waterstop connections or other necessary methods of water migration prevention. In no case shall any fixed metal be continuous through an expansion joint.

3.1.1 Construction Joints

Construction joints shall be installed at the locations and orientations shown on the Drawings and in a manner in which strength and appearance of the concrete are not impaired. Reinforcement shall be continued across construction joints, unless otherwise directed. Keys shall be formed in construction joints as shown on the Drawings. Use an approved bonding agent as specified in paragraph "Latex Bonding Compound" of Section 03 35 00 CONCRETE FINISHING at locations where fresh concrete is placed against hardened concrete or partially hardened concrete surfaces.

3.1.2 Contraction Joints

Contraction joints shall be installed at the locations and orientations shown on the Drawings. Contraction joint depressions shall be formed, grooved, or saw cut by the Contractor. Formed joints shall be created by molding attached to the formwork. Grooved joints shall be formed by a skilled concrete finisher after initial floating by grooving or finishing each edge of the joint to a radius of 1/8 inch. Contractor shall eliminate grooving tool marks on finished concrete surfaces. Sawed joints shall be created after the concrete has set but before the concrete develops random contraction cracks, with power saws equipped with shatterproof abrasive or diamond-rimmed blades and operated with a cutting action that will not tear, abrade, or otherwise damage the concrete surface. Contraction joints shall be filled with a bond breaker and joint sealant in accordance with paragraphs "Sealant" and "Bond Breaker".

3.1.3 Expansion Joints

Preformed expansion joint filler in expansion joints shall be used. The filler shall be extended full depth, unless otherwise directed. Neatly finish the edges of the joint with an edging tool of 1/8 inch radius. Where the joint is to receive a sealant, the filler strips shall be installed at the proper level below the finished surface with a slightly tapered, dressed, and oiled wood strip temporarily secured to the top to form a recess. Remove the wood strip after the concrete has set. Contractor may opt to use a removable expansion filler cap designed and fabricated for this purpose in lieu of the wood strip. Thoroughly clean the groove of laitance, curing compound, foreign materials, protrusions of hardened concrete, and any dust. If blowing out the groove, oil-free compressed air shall be used.

3.1.4 Joint Sealant

Contraction joints and expansion joints shall be filled with joint sealant, unless otherwise directed. Joint surfaces shall be clean, dry, and free of oil or other foreign material. Do not seal joints when the sealant material, ambient air, or concrete temperature is less than 40 degrees F. Joints requiring a bond breaker shall be coated with curing compound or with bituminous paint. Install bond breaker and back-up material where required. Joints shall be primed and filled flush with joint sealant in accordance with the manufacturer's recommendations.

3.2 INSTALLATION AND SPLICES OF WATERSTOPS

Install waterstops to form a continuous watertight diaphragm. Make adequate provisions to support and completely protect the waterstop during the progress of the work, such as hog rings or grommets spaced at 12 inches on center along the length of the waterstop and tie wired to adjacent reinforcing steel. Repair or replace any waterstop punctured or damaged. Protect exposed waterstops during application of form release agents to avoid being coated. Provide suitable guards to protect exposed projecting edges and ends of partially embedded waterstops from damage when concrete placement has been discontinued. Accomplish splices with certified trained personnel using approved equipment and procedures.

3.2.1 Field Trial Seaming

Prior to field seaming of the waterstops, trial seams shall be made on pieces of waterstop to verify that seaming conditions are adequate. Trial seams shall be made at the beginning of each seaming period and at least once every week or if changes in personnel, equipment or weather conditions occur. Follow approved manufacturer recommendations for equipment being used. Lapping of waterstop, use of adhesives, or solvents shall not be allowed. Each seamer shall make at least one trial seam. The trial seam sample shall be made using two waterstop pieces. The specimens shall be visually inspected for pinholes and separations or damaged areas. If a trial seam fails, the entire operation shall be repeated. If the additional trial seam fails, the seaming apparatus or seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are achieved.

The field trial seaming operation shall be observed by the Owner or appointed representative. The successful trial seam sample piece shall be provided to the Owner for record purposes. Upon acceptance of the field trial seaming operations by the Owner or appointed representative, actual field seaming of the waterstops can commence.

3.2.2 Non-Metallic Waterstops

Fittings shall be shop fabricated using a machine specifically designed to mechanically weld the waterstop. A miter guide, proper fixturing (profile dependant), and portable power saw shall be used to miter cut the ends to be joined to ensure proper alignment and contact between joined surfaces. The splicing of straight lengths shall be done by squaring the ends to be joined. Maintain continuity of the characteristic features of the cross section of the waterstop (ribs, tabular center axis, protrusions, etc.) across the splice.

3.2.2.1 Polyvinyl Chloride Waterstop

Splices shall be made by heat sealing the adjacent waterstop edges together using a thermostatically controlled splicing iron utilizing a nonstick surface specifically designed for waterstop welding. Use the correct temperature to sufficiently melt without charring the plastic. At splices, reform waterstop with a remolding iron having ribs or corrugations to match the pattern of the waterstop. The spliced area, when cooled, shall show no signs of separation, holes, or other imperfections when bent by hand in as sharp an angle as possible.

3.3 CONSTRUCTION JOINTS

Construction joints are specified in Section 03 31 00 CAST-IN-PLACE STRUCTURAL CONCRETE, except that construction joints coinciding with expansion and contraction joints shall be treated as expansion or contraction joints as applicable.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements of furnishing all labor, equipment, materials, and supplies for steel bars and accessories for concrete reinforcement, unless otherwise specified.

1.2 REFERENCES

ACI INTERNATIONAL (ACI)

ACI 318	(2011) Building Code Requirements for Structural Concrete and Commentary
ACI SP-66	(2004) ACI Detailing Manual

ASTM INTERNATIONAL (ASTM)

ASTM A 615/A 615M	(2009b) Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

1.3 SUBMITTALS

A. Contractor shall submit detail drawings showing reinforcing steel placement, schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes, and spacing.

B. Contractor shall submit certified mill test reports for all concrete reinforcement stating the materials are in compliance with all the specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

Reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 – PRODUCTS

2.1 REINFORCING STEEL

Reinforcing steel shall be deformed bars conforming to ASTM A 615/A 615M, Grade 60, sizes as indicated.

2.2 WIRE TIES

Wire ties shall be 16 gauge or heavier black annealed steel wire.

2.3 SUPPORTS

Bar supports shall comply with the requirements of ACI SP-66. Supports for bars in concrete with formed surfaces exposed to view shall be plastic-coated wire or stainless steel.

PART 3 – EXECUTION

3.1 REINFORCEMENT

Reinforcement steel and accessories shall be fabricated and placed as specified and shown on the approved shop drawings. Fabrication and placement details of steel and accessories not specified or shown shall be in accordance with ACI SP-66 and ACI 318. Reinforcement shall be cold bent. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Safety caps shall be placed on all exposed ends of vertical concrete reinforcement bars that pose a danger to life safety. Wire tie ends shall face away from the forms.

3.1.1 Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with ACI 318 at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318. If bars are moved more than one bar diameter to avoid interference with other reinforcement or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

3.1.2 Splicing

Splices of reinforcement shall conform to ACI 318 and shall be made only as required or indicated. Splicing shall be by lapping. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 6 inches. Splices in steel bars shall be made only as required. Bars may be spliced at alternate or additional locations at no additional cost to the Owner subject to approval.

3.1.3 Placing Tolerances

3.1.3.1 Spacing

The spacing between adjacent bars and the distance between layers of bars may not vary from the indicated position by more than one bar diameter nor more than 1 inch.

3.1.3.2 Concrete Cover

The minimum concrete cover of main reinforcement steel bars shall be as shown on the Contract Drawings. The allowable variation for minimum cover shall be as follows:

MINIMUM COVER (inch)	VARIATION (inch)
6	plus 1/2
4	plus 3/8
3	plus 3/8
2	plus 1/4
1-1/2	plus 1/4
1	plus 1/8
3/4	plus 1/8

3.2 INSPECTIONS

Steel reinforcement shall be visually inspected by the Contractor to verify proper placement in accordance with the approved shop drawings, including clear covers, development lengths, length of splices, etc., prior to furnishing concrete. Reinforcement not in accordance with the approved shop drawings shall be removed and replaced or reinstalled at no additional expense to the Owner.

END OF SECTION

SECTION 03 31 00

CAST-IN-PLACE STRUCTURAL CONCRETE (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all cast-in-place concrete to be placed under this Contract, unless otherwise specified. Cast-in-place concrete shall include, but not be limited to, lake riser structure foundation slab, pump station, lake emergency spillway liner and cut-off wall, and any other miscellaneous concrete placements or repair work to be performed.

1.2 REFERENCES

ACI INTERNATIONAL (ACI)

ACI CP-1	(2013) Technical Workbook for ACI Certification of Concrete Field Testing Technician – Grade I
ACI 117	(2010) Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 201.2R	(2008) Guide to Durable Concrete
ACI 211.1	(1991; R 2009) Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 214R	(2011) Evaluation of Strength Test Results of Concrete
ACI 309R	(2005) Guide for Consolidation of Concrete

ASTM INTERNATIONAL (ASTM)

ASTM C 1064/C 1064M	(2008) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C 1077	(2011b) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 1260	(2007) Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 143/C 143M	(2010a) Standard Test Method for Slump of Hydraulic-Cement Concrete

ASTM C 150/C 150M	(2011) Standard Specification for Portland Cement
ASTM C 1567	(2011) Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM C 192/C 192M	(2007) Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231/C 231M	(2010) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260/C 260M	(2010a) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 31/C 31M	(2010) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 33/C 33M	(2011a) Standard Specification for Concrete Aggregates
ASTM C 39/C 39M	(2011) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 494/C 494M	(2011) Standard Specification for Chemical Admixtures for Concrete
ASTM C 618	(2008a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C 94/C 94M	(2011b) Standard Specification for Ready-Mixed Concrete
ASTM C 989	(2010) Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM D 75/D 75M	(2009) Standard Practice for Sampling Aggregates
ASTM E 329	(2011c) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST HB 44	(2010) Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices

NATIONAL READY MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA CPMB 100	(2000; R 2006) Concrete Plant Standards

1.3 DESIGN REQUIREMENTS

For each portion of the structure, select concrete mixture proportions so that the strength and water-cement requirements are met. No substitution shall be made in the source or type of materials used in the work without additional tests to show that the quality of the new materials and concrete are satisfactory. The concrete mixture quantities of all ingredients per cubic yard and nominal maximum coarse aggregate size that will be used in the manufacture of each quality of concrete shall be stated. Proportions shall indicate the mass of cement, pozzolan, ground granulated blast-furnace (GGBF) slag, when used, and water; the mass of aggregates in a saturated surface-dry condition; and the quantities of admixtures. Nominal maximum size coarse aggregate shall be 1-1/2 inches, except 3/4 inch nominal maximum size coarse aggregate shall be used when any of the following conditions exist:

A. The narrowest dimension between sides of forms is less than 7-1/2 inches;

B. The depth of the slab is less than 4 inches; or

C. The minimum clear spacing between reinforcing is less than 2-1/4 inches.

1.3.1 Air Content

Air content, as delivered to the forms and as determined by ASTM C 231/C 231M, shall be between 4 percent and 7 percent, except that when the nominal maximum size coarse aggregate is 3/4 inch it shall be between 4.5 percent and 7.5 percent.

1.3.2 Slump

The slump shall be determined in accordance with ASTM C 143/C 143M and shall be within the range of 1 inch to 4 inches. Where placement by pump is approved, the slump shall not exceed 6 inches.

1.3.3 Concrete Proportioning

Trial batches and testing requirements for various qualities of concrete specified are the responsibility of the Contractor. Obtain samples of aggregates in accordance with the requirements of ASTM D 75/D 75M. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by the manufacturer's test reports indicating compliance with applicable specified requirements. Make trial mixtures having proportions, consistencies, and air content suitable for the work based on methodology described in ACI 211.1, using at least three different water-cement ratios, which will produce a range of strength encompassing those required for the work. The maximum water-cement ratios required in paragraph "Maximum Water-Cement (W/C) Ratio" below will be converted to a weight ratio of water to cement plus pozzolan by mass, or GGBF slag by mass equivalency as described in ACI 211.1. In the case where GGBF slag is used, include the weight of the slag in the equations for the term P, which is used to denote the mass of pozzolan. If pozzolan is used in the concrete mixture, the minimum pozzolan content shall be 15 percent of the total cementitious material. Proportion trial mixtures for maximum permitted slump and air content with due consideration to the approved conveying and placement method. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192/C 192M; they shall be tested at 7 days and at the design age specified in accordance with ASTM C 39/C 39M. From these test results, a curve will be plotted showing the relationship between water-cement ratio and strength.

1.3.4 Required Average Compressive Strength

In meeting the strength requirements specified below, the selected mixture proportion shall produce a required average compressive strength f'cr exceeding the specified strength f'c by the amount indicated below.

1.3.4.1 Average Compressive Strength from Test Records

A. Where a concrete production facility has test records, establish a standard deviation in accordance with the applicable provisions of ACI 214R. Test records from which a standard deviation is calculated shall represent materials, quality control procedures, and conditions similar to those expected; shall represent concrete produced to meet a specified strength or strengths (f'c) within 1,000 pounds per square inch of that specified for proposed work; and shall consist of at least 30 consecutive tests. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days or at another test age designated for determination of f'c. Required average compressive strength f'cr used as the basis for selection of concrete proportions shall be the larger of the following equations using the standard deviation as determined above:

1. f'cr = f'c + 1.34*S

2. f'cr = f'c + 2.33*S - 500

Where S = Standard Deviation.

B. Where a concrete production facility does not have test records meeting the requirements above, but does have a record based on 15 to 29 consecutive tests, a standard deviation shall be established as the product of the calculated standard deviation and a modification factor from the following table:

NUMBER OF TESTS*	MODIFICATION FACTOR FOR STANDARD DEVIATION
Less Than 15	Use tabulation in paragraph "Required Average Compressive Strength".
15	1.16
20	1.08
25	1.03
30 or More	1.00
*Interpolate for intermediate numbers of tests.	

1.3.4.2 Average Compressive Strength without Previous Test Records

When a concrete production facility does not have sufficient field strength test records for calculation of the standard deviation, determine the required average strength f'cr as follows:

A. If the specified compressive strength f'c is less than 3,000 psi: f'cr = f'c + 1,000.

B. If the specified compressive strength f'c is 3,000 to 5,000 psi: f'cr = f'c + 1,200.

C. If the specified compressive strength f'c is over 5,000 psi: f'cr = f'c + 1,400.

1.3.5 Concrete Strength

Specified compressive strength f'c shall be as follows.

COMPRESSIVE STRENGTH (PSI)	LOCATION OF CONCRETE PLACEMENT
5,000 at 28 days	All concrete structures constructed under this Contract.

1.3.6 Maximum Water-Cement (W/C) Ratio

Maximum W/C ratio shall be as follows. This W/C ratio may cause higher strengths than that required by paragraph "Concrete Strength".

WATER-CEMENT RATIO, BY MASS	LOCATION OF CONCRETE PLACEMENT
0.40	All concrete structures constructed under this Contract.

1.3.7 Construction Tolerances

Except as specified otherwise, a plus tolerance increases and a minus tolerance decreases the dimension to which it applies. A tolerance without sign means plus or minus. Where only one sign is specified, there is no limit in the other direction. Tolerances are not cumulative. The most restrictive tolerance will control. Tolerances shall not extend the structure beyond legal boundaries.

A. Level and grade tolerance measurements of slabs shall be made as soon as possible after finishing. When forms or shoring are used, the measurements shall be made prior to removal.

B. Construction tolerances shall meet the requirements of ACI 117.

1.3.8 Appearance

Permanently exposed surfaces shall be cleaned, if stained or otherwise discolored, by a method that does not harm the concrete and that is approved by the Owner or their appointed representative.

1.4 SUBMITTALS

A. Submit qualifications of the Contractor's testing agency personnel and field personnel, indicating the ACI certifications and grades for each person performing testing on the project.

B. Submit design data for concrete mixture proportions as determined by the Contractor and submitted for review and approval prior to batching. The submission shall be accompanied by test reports from a qualified testing agency complying with ASTM C 1077 and ASTM E 329 showing that proportions thus selected will produce concrete of the qualities indicated.

C. Submit product data, mill test reports, and certificates of compliance for all cementitious materials and chemical admixtures stating the materials and admixtures are in compliance with all the specified requirements of these Contract Specifications.

D. Submit the source from which aggregates will be furnished for approval.

E. Submit batch plant data in conformance with applicable specifications for approval prior to batching.

F. Submit concrete mixer data, including the make, type, and capacity of concrete mixers proposed for mixing concrete.

G. Submit data on the conveying equipment and methods for transporting, handling, and depositing the concrete.

H. Submit the method and equipment proposed for joint cleanup and waste disposal for approval.

I. Submit the proposed materials, methods, and protection for approval, if concrete is to be placed under cold weather conditions.

J. Submit the proposed materials and methods for approval, if concrete is to be placed under hot weather conditions.

K. Submit test results and inspection reports daily and weekly for approval.

L. Submit aggregate quality test results at least 30 days prior to start of concrete placement.

M. Submit the results of the initial mixer uniformity tests, at least 5 days prior to the initiation of placement.

1.5 DELIVERY, STORAGE, AND HANDLING

Chemical admixtures that have been in storage for longer than six months or have been subjected to freezing shall be retested at the expense of the Contractor when directed by the Owner or their appointed representative and rejected if test results are not satisfactory. Chemical admixtures will be accepted based on compliance with the requirements of paragraph "Chemical Admixtures".

PART 2 – PRODUCTS

2.1 MATERIALS

2.1.1 Cementitious Materials

Cementitious materials shall be portland cement, or portland cement in combination with pozzolan or ground granulated blast-furnace (GGBF) slag conforming to appropriate specifications listed below. Restrict usage of cementitious materials in concrete that will have surfaces exposed in the completed structures so there is no change in color, source, or type of cementitious material.

2.1.1.1 Portland Cement

A. Portland cement shall be ASTM C 150/C 150M, Type V or equivalent for Class 2 sulfate exposure. The maximum amount of tricalcium aluminate (C_3A) in Type V cement shall be 5 percent. The maximum amount of tetracalcium aluminoferrite plus twice the tricalcium aluminate (C_4AF + $2*(C_3A)$) in Type V cement shall be 25 percent. Table 2 optional chemical requirement of ASTM C 150/C 150M for alkalies shall apply when cement is to be used in the concrete mix with aggregates that may be deleteriously reactive as defined in ASTM C 33/C 33M.

B. If Type V cement is not available for batching from the concrete plant, the Contractor shall provide a Class 2 sulfate exposure equivalent in accordance with Sections 6.2.5, 6.2.7, and 6.2.9 of ACI 201.2R. The equivalent mix design shall be approved prior to batching.

2.1.1.2 Pozzolan (Fly Ash)

Pozzolan shall conform to ASTM C 618, Class F, with the optional requirements for multiple factor, drying shrinkage, and uniformity of Table 2A of ASTM C 618. Table 1A requirement of ASTM C 618 for maximum alkalies shall apply when used with concrete containing deleteriously reactive aggregates and cement to meet the low alkali content limitation.

2.1.1.3 Ground Granulated Blast-Furnace Slag

Ground granulated blast-furnace (GGBF) slag shall conform to ASTM C 989, Grade 100 or 120.

2.1.2 Aggregates

2.1.2.1 General

Concrete aggregates may be furnished from any source capable of meeting the quality requirements below. Fine and coarse aggregates shall conform to the grading requirements of ASTM C 33/C 33M. Where the use of Pennsylvania Department of Transportation gradations are permitted, proposed gradations shall be submitted for approval.

2.1.2.2 Concrete Aggregate Sources

After the award of the Contract, Contractor shall designate in writing only one source or combination of sources from which to furnish aggregates. If a source for coarse or fine aggregates, so designated by the Contractor, does not meet the quality requirements specified below, the Contractor may not submit other sources for approval, but shall furnish the coarse or fine aggregate, as the case may be, from sources approved by the Owner or his appointed representative.

2.1.2.3 Quality

A. The aggregate particles shall be clean, hard, unweathered, and uncoated. The shape of the particles shall be generally cubical or spherical. Where required, fines shall be removed from the aggregates by adequate washing. The aggregates as delivered to the mixer shall meet the quality requirements of ASTM C 33/C 33M, Table 3, for the appropriate type or location of concrete construction for use in a severe climate.

B. Fine and coarse aggregates delivered to the mixer shall be tested and evaluated for alkali-aggregate reactivity in accordance with ASTM C 1260. The fine and coarse aggregates shall be evaluated separately and in combination, which matches the Contractor's proposed mix design proportioning. All results of the separate and combination testing shall have a measured expansion less than 0.10 percent at 16 days after casting. Should the test data indicate an expansion of 0.10 percent or greater, the aggregate(s) shall be rejected or additional testing using ASTM C 1260 and ASTM C 1567 shall be performed. The additional testing using ASTM C 1260 and ASTM C 1567 shall be performed using the low alkali portland cement in combination with GGBF slag or Class F fly ash. GGBF slag shall be used in the range of 40 to 50 percent of the total cementitious material by mass.

Class F fly ash shall be used in the range of 25 to 40 percent of the total cementitious material by mass.

2.1.3 Chemical Admixtures

Chemical admixtures, when required or permitted, shall conform to the appropriate specification listed herein.

2.1.3.1 Air-Entraining Admixture

The air-entraining admixture shall conform to ASTM C 260/C 260M and shall consistently cause the concrete to have air contents in the specified ranges under field conditions.

2.1.3.2 Accelerating Admixture

Accelerating admixture shall meet the requirements of ASTM C 494/C 494M, Type C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

2.1.3.3 Water-Reducing or Retarding Admixture

Water-reducing or retarding admixtures shall meet the requirements of ASTM C 494/C 494M, Type A, B, or D, except that the 6 month and 1 year compressive strength tests are waived.

2.1.3.4 High-Range Water Reducing Admixture

High-range water reducing admixtures shall meet the requirements of ASTM C 494/C 494M, Type F or G, except that the 6 month and 1 year compressive strength requirements shall be waived. The admixture may be used only when approved by the Owner or their appointed representative, such approval being contingent upon particular mixture control.

2.1.4 Water

Water for mixing and curing shall be fresh, clean, potable, and free of injurious amounts of oil, acid, salt, or alkali, except that nonpotable water may be used if it meets the requirements of ASTM C 94/C 94M.

2.2 EQUIPMENT

Placing equipment and methods shall have capacities to perform the work continuously without the formation of cold joints. Batch plant shall conform to the requirements of NRMCA CPMB 100 and as specified; however, rating plates attached to batch plant equipment are not required.

2.2.1 Batching Equipment

The batching controls shall be semiautomatic or automatic. Provide the semiautomatic batching system with interlocks such that the discharge device cannot be actuated until the indicated material is within the applicable tolerance. Equip the batching system with an accurate recorder or recorders that meet the requirements of NRMCA CPMB 100. Provide separate bins or compartments for each size group of aggregate and cement, pozzolan, and GGBF slag. Aggregates shall be weighed either in separate weigh batchers with individual scales or cumulatively in one weigh batcher on one scale. Aggregate shall not be weighed in the same batcher with cement, pozzolan, or GGBF slag. If both cement and pozzolan or GGBF slag is used, they may be batched cumulatively provided that the portland cement is batched first. If measured by mass, the mass of the water shall not be weighed cumulatively with another ingredient. Water batcher filling and discharging valves shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed. An accurate mechanical device for measuring and dispensing each admixture shall be provided. Each dispenser shall be interlocked with the batching and discharging operation of the water so that each admixture is separately batched and discharged automatically in a manner to obtain uniform distribution throughout the batch in the specified mixing period. Admixtures shall not be combined prior to introduction in water. The plant shall be arranged so as to facilitate the inspection of all operations at all times. Suitable facilities shall be provided for obtaining representative samples of aggregates from each bin or compartment. All filling ports for cementitious material bins or silos shall be clearly marked with a permanent sign stating the contents.

2.2.2 Scales

The equipment for batching by mass shall conform to the applicable requirements of NIST HB 44, except that the accuracy shall be plus or minus 0.2 percent of scale capacity. Provide standard test weights and any other auxiliary equipment required for checking the operating performance of each scale or other measuring devices. Perform tests at the frequency required in paragraph "Tests and Inspections", and in the presence of the Owner or their appointed representative.

2.2.3 Batching Tolerances

A. Weighing Tolerances:

MATERIAL	PERCENT OF REQUIRED MASS
Cementitious Materials	0 to plus 2
Aggregate	plus or minus 2
Water	plus or minus 1
Chemical Admixtures	0 to plus 6

B. Volumetric Tolerances: For volumetric batching equipment, the following tolerances shall apply to the required volume of material being batched:

MATERIAL	PERCENT OF REQUIRED MATERIAL
Water	plus or minus 1
Chemical Admixtures	0 to plus 6

2.2.4 Moisture Control

The plant shall be capable of ready adjustment to compensate for the varying moisture content of the aggregates and to change the masses of the materials being batched.

2.2.5 Concrete Mixers

The concrete mixers shall not be charged in excess of the capacity recommended by the manufacturer. The mixers shall be operated at the drum or mixing blade speed designated by the manufacturer. Maintain the mixers in satisfactory operating condition, and keep the mixer drums free of hardened concrete. Should any mixer at any time produce unsatisfactory results, promptly discontinue its use until it is repaired.

2.2.5.1 Stationary Mixers

Concrete plant mixers shall be tilting, nontilting, horizontal-shaft, vertical-shaft, or pugmill and provided with an acceptable device to lock the discharge mechanism until the required mixing time has elapsed. The mixing time and uniformity shall conform to all the requirements in ASTM C 94/C 94M applicable to central-mixed concrete.

2.2.5.2 Truck Mixers

Truck mixers, the mixing of concrete therein, and concrete uniformity shall conform to the requirements of ASTM C 94/C 94M. A truck mixer may be used either for complete mixing (transit-mixed) or as an agitator for central-mixed concrete. Shrink mixing shall not be allowed. Equip each truck with two counters from which it will be possible to determine the number of revolutions at mixing speed and the number of revolutions at agitating speed. Water shall not be added at the placing site unless specifically approved by the Owner or their appointed representative; and in no case shall it exceed the specified water-cement ratio. Any such water shall be injected at the base of the mixer, not at the discharge end.

2.2.6 Conveying Equipment

2.2.6.1 Buckets

The interior hopper slope shall not be less than 58 degrees from the horizontal, the minimum dimension of the clear gate opening shall be at least five times the nominal maximum size aggregate, and the area of the gate opening shall not be less than 2 square feet. The maximum dimension of the gate opening shall not be greater than twice the minimum dimension. The bucket gates shall be essentially grout tight when closed and may be manually, pneumatically, or hydraulically operated, except that buckets larger than 2 cubic yards shall not be manually operated. The design of the bucket shall provide means for positive regulation of the amount and rate of deposit of concrete in each dumping position.

2.2.6.2 Transfer Hoppers

Concrete may be charged into nonagitating hoppers for transfer to other conveying devices. Transfer hoppers shall be capable of receiving concrete directly from delivery vehicles and have conical-shaped discharge features. The transfer hopper shall be equipped with a hydraulically operated gate and with a means of external vibration to effect complete discharge. Concrete shall not be held in nonagitating transfer hoppers more than 30 minutes.

2.2.6.3 Chutes

When concrete can be placed directly from a truck mixer, agitator, or nonagitating equipment, the chutes attached to this equipment by the manufacturer may be used. A discharge deflector shall be used when required by the Owner or their appointed representative. Separate chutes and other similar equipment will not be permitted for conveying concrete.

2.2.6.4 Belt Conveyors

Belt conveyors shall be designed and operated to assure a uniform flow of concrete from mixer to final place of deposit without segregation of ingredients or loss of mortar, and shall be provided with positive means for preventing segregation of the concrete at the transfer points and the point of placing. Belt conveyors shall be constructed such that the idler spacing shall not exceed 36 inches. The belt speed shall be a minimum of 300 feet per minute and a maximum of 750 feet per minute. If concrete is to be placed through installed horizontal or sloping reinforcing bars, the conveyor shall discharge concrete into a pipe or elephant trunk that is long enough to extend through the reinforcing bars.

2.2.6.5 Concrete Pumps

Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure type; pneumatic placing equipment shall not be used. The pipeline shall be rigid steel pipe or heavy-duty flexible hose. The inside diameter of the pipe shall be at least three times the nominal maximum size coarse aggregate in the concrete mixture to be pumped, but not less than 4 inches. Aluminum pipe shall not be used.

2.2.7 Vibrators

Vibrators of the proper size, frequency, and amplitude shall be used for the type of work being performed in conformance with the following requirements. Determine the frequency and amplitude in accordance with ACI 309R.

APPLICATION	HEAD DIAMETER (Inches)	FREQUENCY (VPM)	AMPLITUDE (Inches)
Thin Walls, Beams, etc.	1-1/4 to 2-1/2	9,000 to 13,500	0.020 to 0.040
General Construction	2 to 3-1/2	8,000 to 12,000	0.025 to 0.050

PART 3 – EXECUTION

3.1 PREPARATION FOR PLACING

3.1.1 General

Before placement of concrete, take care to determine that all formwork, reinforcement, and embedded items have been inspected and are firmly and securely fastened in place as indicated on the approved shop drawings, Contract Drawings, or as required. Embedded items shall be free of oil and other foreign matter, such as loose coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into voids. Welding, including tack welding, will not be permitted on embedded metals within 2 feet of the surface of the concrete.

3.1.2 Concrete on Earth Foundations

Earth surfaces upon which concrete is to be placed shall be clean, damp, and free from debris, frost, ice, and standing or running water. Prior to placement of concrete, the earth foundation shall have been satisfactorily compacted in accordance with Section 31 00 00 EARTHWORK.

3.1.3 Concrete on Rock Foundations

Rock surfaces upon which concrete is to be placed shall be clean, free from oil, standing or running water, ice, mud, drummy rock, coating, debris, and loose, semi-detached, or unsound fragments. Joints in rock shall be cleaned to a satisfactory depth, as determined by the Owner or their appointed representative, and to firm rock on the sides. Immediately before the concrete is placed, all rock surfaces shall be cleaned thoroughly by the use of air-water jets or sandblasting as described in paragraph "Construction Joint Treatment". All rock surfaces shall be kept continuously wet for at least 24 hours immediately prior to placing concrete thereon. All approximately horizontal surfaces shall be covered, immediately before the concrete is placed, with a layer of mortar proportioned similar to that in the concrete mixture. The mortar shall be covered with concrete before the time of initial setting of the mortar.

3.1.4 Construction Joint Treatment

3.1.4.1 Joint Preparation

Concrete surfaces to which additional concrete is to be bonded shall be prepared for receiving the next lift or adjacent concrete by cleaning with either air-water cutting, sandblasting, high-pressure water jet, or other approved method. Air-water cutting will not be permitted on formed surfaces or surfaces congested with reinforcing steel. Regardless of the method used, the resulting surfaces shall be free from all laitance and inferior concrete so that clean, well bonded coarse aggregate is exposed uniformly throughout the lift surface. The edges of the coarse aggregate shall not be undercut. The surface shall be washed clean again as the last operation prior to placing the next lift. There shall be no standing water on the surface upon which concrete is placed.

3.1.4.2 Air-Water Cutting

Air-water cutting of a construction joint shall be performed at the proper time and only on horizontal construction joints. The air pressure used in the jet shall be 90 pounds per square inch to 110 pounds per square inch, and the water pressure shall be just sufficient to bring the water into effective influence of the air pressure. After cutting, the surface shall be washed and rinsed as long as there is any trace of cloudiness of the wash water. Where necessary to remove accumulated laitance, coatings, stains, debris, and other foreign material, high-pressure water jet or sandblasting will be required as the last operation before placing the next lift.

3.1.4.3 High-Pressure Water Jet

A stream of water under a pressure of not less than 3,000 pounds per square inch may be used for cleaning. Its use shall be delayed until the concrete is sufficiently hard so that only the surface skin or mortar is removed and there is no undercutting of coarse aggregate particles. If the water jet is incapable of a satisfactory cleaning, the surface shall be cleaned by sandblasting.

3.1.4.4 Wet Sandblasting

This method may be used when the concrete has reached sufficient strength to prevent undercutting of the coarse aggregate particles. The surface of the concrete shall then be washed thoroughly to remove all loose materials.

3.1.4.5 Waste Disposal

The method used in disposing of waste water employed in cutting, washing, and rinsing of concrete surfaces shall be such that the waste water does not stain, discolor, or affect exposed surfaces of the structures, or damage the environment of the project area. The method of disposal shall be subject to approval of the Owner or their appointed representative.

3.2 PLACING

3.2.1 Placing Procedures

The surfaces of horizontal construction joints shall be kept continuously wet for the first 12 hours during the 24 hour period prior to placing concrete. Surfaces may be dampened immediately before placement if necessary. Concrete placement will not be permitted when, in the opinion of the Owner or appointed representative, weather conditions prevent proper placement and consolidation. Deposit concrete as close as possible to its final position in the forms and, in so depositing, there shall be no vertical drop greater than 5 feet, except where suitable equipment, such as a properly designed and sized elephant truck with rigid drop chute bottom section, is provided to prevent segregation and where specifically authorized. In no case will concrete be discharged to free-fall through reinforcing bars. Depositing of the concrete shall be so regulated that it may be effectively consolidated in horizontal layers 2 feet or less in thickness with a minimum of lateral movement. The amount deposited in each location shall be that which can be readily and thoroughly consolidated. Sufficient placing capacity shall be provided so that concrete placement can be kept plastic and free of cold joints while concrete is being placed. Concrete shall be placed by methods that will prevent segregation or loss of ingredients. Any concrete transferred from one conveying device to another shall be passed through a hopper that is conical in shape.

3.2.2 Placement by Pump

When concrete is to be placed by pump, the nominal maximum size coarse aggregate shall not be reduced to accommodate the pumps. The distance to be pumped shall not exceed the limits recommended by the pump manufacturer. The concrete shall be supplied to the concrete pump continuously. When pumping is completed, concrete remaining in the pipeline shall be ejected without contamination of concrete in place. After each operation, equipment shall be thoroughly cleaned, and flushing water shall be wasted outside of the forms. Grout used to lubricate the pumping equipment at the beginning of the placement will not be incorporated into the placement.

3.2.3 Time Interval Between Mixing and Placing

Place concrete within 30 minutes after discharge into nonagitating equipment. When concrete is truck-mixed or when a truck mixer or agitator is used for transporting concrete mixed by a concrete plant mixer, the concrete shall be delivered to the project site and discharge shall be completed within 1-1/2 hours after introduction of the cement to the aggregates. When the length of haul makes it impossible to deliver truck-mixed concrete within these time limits, batching of cement and a portion of the mixing water shall be delayed until the truck mixer is at or near the project site.

3.2.4 Cold Weather Placing

When cold weather placement of concrete is likely to be subjected to freezing temperatures before the expiration of the curing period, it shall be placed in accordance with procedures previously submitted and approved in accordance with paragraph "Submittals". The ambient temperature of the space adjacent to the concrete placement and surfaces to receive concrete shall be above 32 degrees F. The placing temperature of the concrete having a minimum dimension less than 12 inches shall be between 55 degrees F and 75 degrees F when measured in accordance with ASTM C 1064/C 1064M. The placing temperature of the concrete having a minimum dimension greater than 12 inches shall be between 50 degrees F and 70 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperatures. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals, or other materials shall not be mixed with the concrete to prevent freezing.

3.2.5 Hot Weather Placing

Concrete shall be properly placed and finished with procedures previously submitted and approved in accordance with paragraph "Submittals". The concrete placing temperature shall not exceed 85 degrees F when measured in accordance with ASTM C 1064/C 1064M. Cooling of the mixing water and aggregates, or both, may be required to obtain an adequate placing temperature. A retarder meeting the requirements of paragraph "Water-Reducing or Retarding Admixture" may be used to facilitate placing and finishing. Steel forms and reinforcement shall be cooled prior to concrete placement when steel temperatures are greater than 120 degrees F. Conveying and placing equipment shall be cooled, if necessary, to maintain proper concrete placement temperature.

3.2.6 Consolidation

Immediately after placement, each layer of concrete shall be consolidated by internal vibrating equipment. Vibrators shall not be used to transport concrete within the forms. Hand spading may be required, if necessary, with internal vibrating along formed surfaces permanently exposed to view. Form or surface vibrators shall not be used unless specifically approved by the Owner or their appointed representative. The vibrator shall be inserted vertically at uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding unhardened layer if such exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly.

3.3 TESTS AND INSPECTIONS

3.3.1 General

Perform the inspections and tests described below and, based upon the results of these inspections and tests, the Contractor shall take the action required and submit reports as required. When, in the opinion of the Owner or their appointed representative, the concreting operation is out of control, concrete placement shall cease. The Contractor's qualified testing agency performing the tests shall conform to ASTM C 1077 and ASTM E 329. The Owner or their appointed representative may inspect the laboratory, equipment, and test procedures prior to start of concreting operations and at least once thereafter for conformance with ASTM C 1077 and ASTM E 329. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade I, according to ACI CP-1 or an equivalent certification program. Personnel performing laboratory tests shall be an ACI certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency supervisor shall be an ACI certified Concrete Laboratory Testing Technician, Grade II.

3.3.2 Testing and Inspection Requirements

3.3.2.1 Fine Aggregate

A. Grading: At least once during each shift when the concrete plant is operating, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136 for the fine aggregate or for each size range of fine aggregate if it is batched in more than one size or classification. The location at which samples are taken may be selected by the Contractor as the most advantageous for control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits.

B. Corrective Action for Grading: When the amount passing on any sieve is outside the specification limits, the fine aggregate shall be immediately re-sampled and retested. If there is another failure on any sieve, the fact shall immediately be reported to the Owner or their appointed representative.

3.3.2.2 Coarse Aggregate

A. Grading: At least once during each shift in which the concrete plant is operating, there shall be a sieve analysis in accordance with ASTM C 136 for each size of coarse aggregate. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. A test record of samples of aggregate taken at the same locations shall show the results of the current test as well as the average results of the five most recent tests, including the current test. The Contractor may adopt limits for control which are coarser than the specification limits for samples taken at locations other than as delivered to the mixer to allow for degradation during handling.

B. Corrective Action for Grading: When the amount passing any sieve is outside the specification limits, the coarse aggregate shall be immediately re-sampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Owner or their appointed representative. Where two consecutive averages of five tests are outside specification limits, the operation shall be considered out of control and shall be reported to the Owner or their appointed representative. Concreting shall be stopped and immediate steps shall be taken to correct the grading.

3.3.2.3 Quality of Aggregates

A. Frequency of Quality Tests: Thirty days prior to the start of concrete placement, perform all tests for aggregate quality required by ASTM C 33/C 33M. In addition, after the start of concrete placement, perform tests for aggregate quality at least every three months, and when the source of aggregate or aggregate quality changes. Samples tested after the start of concrete placement shall be taken immediately prior to entering the concrete mixer.

B. Corrective Action for Aggregate Quality: If the result of a quality test fails to meet the requirements for quality immediately prior to start of concrete placement, production procedures or materials shall be changed and additional tests shall be performed until the material meets the quality requirements prior to proceeding with either mixture proportioning studies or starting concrete placement. After concrete placement commences, whenever the result of a test for quality fails the requirements, the test shall be rerun immediately. If the second test fails the quality requirement, the fact shall be reported to the Owner or their appointed representative and immediate steps taken to rectify the situation.

3.3.2.4 Scales, Batching, and Recording

A. Weighing Accuracy: The accuracy of the scales shall be checked by test weights prior to start of concrete operations and at least once every three months for conformance with the applicable requirements of paragraph "Scales". Such tests shall also be made as directed whenever there are variations in properties of the fresh concrete that could result from batching errors.

B. Batching and Recording Accuracy: Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. Confirm that the calibration devices described in paragraph "Equipment", for checking the accuracy of dispensed admixtures, are operating properly.

C. Scales Corrective Action: When either the weighing accuracy or batching accuracy does not comply with specification requirements, the plant shall not be operated until necessary adjustments or repairs have been made. Discrepancies in recording accuracies shall be corrected immediately.

3.3.2.5 Batch Plant Control

The measurement of all constituent materials, including cementitious materials, each size of aggregate, water, and admixtures, shall be continuously controlled. The aggregate weights and amount of added water shall be adjusted as necessary to compensate for free moisture in the aggregates. The amount of air-entraining admixture shall be adjusted to control air content within specified limits. A report shall be prepared indicating type and source of cement used, type and source of pozzolan or GGBF slag used, amount and source of admixtures used, aggregate source, the required aggregate and water weights per cubic yard, amount of water as free moisture in each size of aggregate, and the batch aggregate and water weights per cubic yard for each class of concrete batched during plant operation.

3.3.2.6 Concrete Mixture

A. Air Content Testing: Air content tests shall be made when test specimens are fabricated. In addition, at least two tests for air content shall be made on randomly selected batches of each separate concrete mixture produced during each 8 hour period of concrete production. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or the Owner or their appointed representative. Tests shall be made in accordance with ASTM C 231/C 231M. Test results shall be plotted on control charts which shall at all times be readily available to the Owner or appointed representative. Copies of the current control charts shall be kept in the field by the Contractor and results plotted as tests are made. When a single test result reaches either the upper or lower action limit, a second test shall immediately be made. The results of the two tests shall be averaged and this average used as the air content of the batch to plot on both the control chart for air content and the control chart for range, and for determining the need for any remedial action. The result of each test, or average as noted in the previous sentence, shall be plotted on a separate chart for each mixture on which an "average line" is set at the midpoint of the specified air content range from paragraph "Air Content". An upper warning limit and a lower warning limit line shall be set 1.0 percentage point above and below the average line. An upper action limit and a lower action limit line shall be set 1.5 percentage points above and below the average line, respectively. The range between each two consecutive tests shall be plotted on a control chart for range where an upper warning limit is set at 2.0 percentage points and upper action limit is set at 3.0 percentage points. Samples for air content may be taken at the mixer; however, the Contractor is responsible for delivering the concrete to the placement site at the stipulated air content. If the Contractor's materials or transportation methods cause air content loss between the mixer and the placement, correlation samples shall be taken at the placement site as required by the Owner or their appointed representative and the air content at the mixer controlled as directed.

B. Air Content Corrective Action: Whenever points on the control chart for percent air reach either warning limit, an adjustment shall immediately be made in the amount of air-entraining admixture batched. As soon as is practical after each adjustment, another test shall be made to verify the result of the adjustment. Whenever a point on the control chart range reaches the warning limit, the admixture dispenser shall be recalibrated to ensure that it is operating accurately and with good reproducibility. Whenever a point on either control chart reaches an action limit line, the air content shall be considered out of control and the concreting operation shall immediately be halted until the air content is under control. Additional air content tests shall be made when concreting is restarted. All this shall be at no extra cost to the Owner.

C. Slump Testing: In addition to slump tests which shall be made when test specimens are fabricated, at least four slump tests shall be made on randomly selected batches in accordance with ASTM C 143/C 143M for each separate concrete mixture produced during each 8 hour or less period of concrete production each day. Also, additional tests shall be made when excessive variation in workability is reported by the placing foreman or the Owner or their appointed representative. Test results shall be plotted on control charts which shall at all times be readily available to the Owner or their appointed representative. Copies of the current control charts shall be kept in the field by the Contractor and results plotted as tests are made. When a single slump test reaches or goes beyond either the upper or lower action limit, a second test shall immediately be made on the same batch of concrete. The results of the two tests shall be averaged and this average used as the slump of the batch to plot on both the control chart for percent air and the chart for range, and for determining the need for any remedial action. An upper warning limit shall be set at 1/2 inch below the maximum allowable slump on separate control charts for percent air used for each type of mixture as specified in paragraph "Slump", and an upper action limit line and lower action limit line shall be set at the maximum and minimum allowable slumps, respectively, as specified in the same paragraph. The range between each consecutive slump test for each type of mixture shall be plotted on a single control chart for range on which an upper action limit is set at 2 inches. Samples for slump shall be taken at the mixer; however, the Contractor is responsible for delivering the concrete to the placement site at the stipulated slump. If the Contractor's materials or transportation methods cause slump loss between mixer and the placement, correlation samples shall be taken at the placement site as required by the Owner or their appointed representative and the slump at the mixer controlled as directed.

D. Slump Corrective Action: Whenever points on the control chart for slump reach the upper warning limit, an adjustment shall be immediately made in the batch weights of water and fine aggregate. The adjustments are to be made so that the total water content does not exceed that amount allowed by the maximum water-cement ratio specified based upon aggregates which are in a saturated surface-dry condition. When a single slump reaches the upper or lower action limit, no further concrete shall be delivered to the placing site until proper adjustments have been made. Immediately after each adjustment, another test shall be made to verify the correctness of the adjustment. Whenever two consecutive slump tests, made during a period when there was no adjustment of batch weights, produce a point on the control chart for range at or above the upper action limit, the concreting operation shall immediately be halted and take appropriate steps to bring the slump under control. Also, additional slump tests shall be made as directed. All this shall be at no additional cost to the Owner.

E. Temperature: The temperature of the concrete shall be measured when compressive strength specimens are fabricated. Measurement shall be in accordance with ASTM C 1064/C 1064M. The temperature shall be reported along with the compressive strength data.

F. Compressive Strength Specimens: At least one set of test specimens shall be made each day on each different concrete mixture placed during the day. Additional sets of test cylinders shall be made, as directed by the Owner or appointed representative, when the mixture proportions are changed or when low strengths have been detected. A random sampling plan shall be developed and approved by the Owner or appointed representative prior to the start of construction. The plan shall assure that sampling is done in a completely random and unbiased manner. A set of test specimens for concrete with a 28-day specified strength in accordance with paragraph "Design

Requirements" shall consist of four cylinders, two to be tested at 7 days and two at 28 days. Test specimens shall be molded and cured in accordance with ASTM C 31/C 31M and tested in accordance with ASTM C 39/C 39M. All compressive strength test results shall be reported immediately to the Owner or appointed representative. Reports shall contain the project identification name and number, date of concrete placement, name of concrete testing and inspection agency, location of concrete batch in the work, design compressive strength at 28-days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests. Quality control charts shall be kept for individual strength tests, moving average for strength, and moving average for range for each mixture. The charts shall be similar to those found in ACI 214R.

3.3.2.7 Inspection Before Placing

Foundation or construction joints, forms, and embedded items shall be inspected for quality in sufficient time prior to each concrete placement to certify to the Owner or their appointed representative that they are ready to receive concrete. The results of each inspection shall be reported in writing.

3.3.2.8 Placing

A. Placing Inspection: The placing foreman shall supervise all placing operations, shall determine that the correct quality of concrete is placed in each location as directed, and shall be responsible for measuring and recording concrete temperatures and ambient temperature hourly during placing operations, weather conditions, time of placement, yardage placed, and method of placement.

B. Placing Corrective Action: The placing foreman shall not permit batching and placing to begin until they have verified that an adequate number of vibrators in working order and with competent operators are available. Placing shall not be continued if any concrete is inadequately consolidated. If any batch of concrete fails to meet the temperature requirements, immediate steps shall be taken to improve temperature controls.

3.3.2.9 Vibrators

A. Vibrator Testing and Use: The frequency and amplitude of each vibrator shall be determined in accordance with ACI 309R prior to initial use and at least once a month when concrete is being placed. Additional tests shall be made as directed when a vibrator does not appear to be adequately consolidating the concrete. The frequency shall be determined at the same time the vibrator is operating in concrete with the tachometer held against the upper end of the vibrator head while almost submerged and just before the vibrator is withdrawn from the concrete. The amplitude shall be determined with the head vibrating in air. Two measurements shall be taken, one near the tip and another near the upper end of the vibrator head and these results averaged. The make, model, type, and size of the vibrator and frequency and amplitude results shall be reported in writing.

B. Vibrator Corrective Action: Any vibrator not meeting the requirements of paragraph "Vibrators" shall be immediately removed from service and repaired or replaced.

3.3.2.10 Mixer Uniformity

A. Stationary Mixers Uniformity: Prior to the start of concrete placement and once every 3 months when concrete is being placed, or once for every 2,500 cubic yards of concrete placed, whichever results in the longest time interval, uniformity of concrete mixing shall be determined in accordance with ASTM C 94/C 94M.

B. Truck Mixers Uniformity: Prior to the start of concrete placement and at least once every 3 months when concrete is being placed, uniformity of concrete shall be determined in accordance with ASTM C 94/C 94M. The truck mixers shall be selected randomly for testing. When satisfactory performance is found in one truck mixer, the performance of mixers of substantially the same design and condition of the blades may be regarded as satisfactory.

C. Mixer Uniformity Corrective Action: When a mixer fails to meet mixer uniformity requirements, either the mixer shall be removed from service on the work, the mixing time shall be increased, batching sequence changed, batch size reduced, or adjustments shall be made to the mixer until compliance is achieved.

3.3.3 Reports

All results of tests or inspections conducted shall be reported informally as they are completed and in writing daily. A weekly report shall be prepared for the updating of control charts covering the entire period from the start of the construction season through the current week. During periods of cold and hot weather protection, reports of pertinent temperatures shall be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in the preceding paragraphs. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Owner or their appointed representative has the right to examine all test and inspection records.

END OF SECTION

SECTION 03 35 00

CONCRETE FINISHING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all cast-in-place structural concrete finishing to be performed under this Contract, unless otherwise specified.

1.2 REFERENCES

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 302.1R	(2004) Guide for Concrete Floor and Slab Construction
ACI 305R	(2010) Guide to Hot Weather Concreting

ASTM INTERNATIONAL (ASTM)

ASTM C 1059/C 1059M	(1999; R 2008) Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete
ASTM C 881/C 881M	(2010) Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

1.3 SUBMITTALS

A. Submit manufacturer's product data, literature, and recommended instructions, including safety data sheets, for latex bonding compound and epoxy resin for approval prior to furnishing onsite.

B. Submit replacement concrete mix design for approval prior to batching.

C. Submit certificates of compliance stating the bonding agents and repair materials are in compliance with all the specified requirements of these Contract Specifications.

PART 2 – PRODUCTS

2.1 LATEX BONDING COMPOUND

Latex bonding compound agents for bonding fresh to hardened concrete shall conform to ASTM C 1059/C 1059M.

2.2 EPOXY RESIN

Epoxy resin for use in repairs shall conform to ASTM C 881/C 881M, Type III, Grade I or II.

PART 3 – EXECUTION

3.1 FINISHING FORMED SURFACES

Forms, form materials, and form construction are specified in Section 03 11 13 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING. Finishing of formed surfaces shall be as specified herein. Surfaces shall be left with the texture imparted by the forms, except that defective surfaces shall be repaired. Maintain uniform color of the concrete by use of only one mixture without changes in materials or proportions for any structure or portion of a structure. The form panels used to produce the specified finishes shall be orderly in arrangement, with joints between panels planned in approved relation to openings, corners, and other features. Forms shall not be reused if there is any evidence of surface wear or defects that would impair the quality of the surface.

3.1.1 Class A Finish

All exposed to view surfaces shall receive a Class A finish. Remove fins, ravelings, and loose material. All surface defects over 1/2 inch in diameter or more than 1/2 inch deep shall be repaired. Except as otherwise indicated or as specified in Section 03 11 13 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING, holes left by removal of form ties shall be reamed and filled. Defects more than 1/2 inch in diameter shall be cut back to sound concrete, but in all cases at least one inch deep. Metal tools shall not be used to finish repairs in Class A surfaces.

3.1.2 Class D Finish

All surfaces against which backfill will be placed shall receive a Class D finish. Fins, ravelings, and loose material shall be removed. Except as otherwise indicated or as specified in Section 03 11 13 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING, holes left by removal of form ties shall be reamed and filled. Honeycomb and other defects more than 1/2 inch deep or more than 2 inches in diameter shall be repaired. Defects more than 2 inches in diameter shall be cut back to sound concrete, but in all cases at least 1 inch deep.

3.2 FORMED SURFACE REPAIR

After removal of forms, all ridges, lips, and bulges on surfaces permanently exposed shall be removed. All repairs shall be completed within 48 hours after form removal.

3.2.1 Class A Finishes

Surfaces specified in Section 03 11 13 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING to have a Class A finish shall have surface defects repaired as follows:

A. Defective areas, voids, and honeycombs smaller than 16 square inches in area and less than 1/2 inch deep, and bug holes exceeding 1/2 inch in diameter shall be chipped and filled with dry-packed mortar.

B. Defective and unsound concrete areas larger than described above shall be defined by 1/2 inch deep dovetailed saw cuts in a rectangular pattern with lines parallel to the formwork, the defective concrete removed by chipping, and the void repaired with replacement concrete.

C. The prepared area shall be brush-coated with an epoxy resin meeting the requirements of paragraph "Epoxy Resin", latex bonding agent meeting the requirements of paragraph "Latex Bonding Compound", or a neat cement grout after dampening the area with water.

D. The void shall be filled with replacement concrete in accordance with paragraph “Material and Procedure for Repairs” below.

3.2.2 Class D Finishes

Surfaces listed in Section 03 11 13 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING to have a Class D finish shall have surface defects repaired as follows:

A. Defective areas, voids, and honeycombs greater than 48 square inches in area or more than 2 inches deep shall be defined by 1/2 inch deep dovetailed saw cuts in a rectangular pattern, the defective concrete removed by chipping and the void repaired with replacement concrete.

B. The prepared area shall be brush-coated with an epoxy resin meeting the requirements of paragraph “Epoxy Resin”, latex bonding agent meeting the requirements of paragraph “Latex Bonding Compound”, or a neat cement grout after dampening the area with water.

C. The void shall be filled with replacement concrete in accordance with paragraph “Material and Procedure for Repairs” below.

3.2.3 Material and Procedure for Repairs

The cement used in the dry-packed mortar or replacement concrete shall be a blend of the cement used for production of project concrete and white portland cement properly proportioned so that the final color of the mortar or concrete will match adjacent concrete. Trial batches shall be used to determine the proportions required to match colors. Dry-packed mortar shall consist of one part cement to two and one-half parts fine aggregate. The fine aggregate shall be that used for production of project concrete. The mortar shall be remixed over a period of at least 30 minutes without addition of water until it obtains the stiffest consistency that will permit placing. Mortar shall be thoroughly compacted into the prepared void by tamping, rodding, ramming, etc., and struck off to match adjacent concrete. Replacement concrete shall be produced using project materials and shall be proportioned by the Contractor and approved by the Owner or their appointed representative prior to batching. It shall be thoroughly compacted into the prepared void by internal vibration, tamping, rodding, ramming, etc., and shall be struck off and finished to match adjacent concrete. Forms shall be used to confine the concrete. If an expanding agent is used in the replacement concrete, the repair shall be thoroughly confined on all sides, including the top surface. Metal tools shall not be used to finish permanently exposed surfaces. The repaired areas shall be cured for 7 days. The temperature of the in situ concrete, adjacent air, and replacement mortar or concrete shall be above 40 degrees F during placement, finishing, and curing. Other methods and materials for repair may be used only when approved in writing by the Owner or their appointed representative. Repairs of the so called "plaster-type" will not be permitted.

3.3 FINISHING UNFORMED SURFACES

The finish of all unformed surfaces shall meet the requirements of paragraph “Construction Tolerances” in Section 03 31 00 CAST-IN-PLACE STRUCTURAL CONCRETE when tested as specified herein. Comply with the requirements of ACI 302.1R for finishing of all foundation slabs.

3.3.1 General

The ambient temperature of spaces adjacent to unformed surfaces being finished and of the base on which concrete will be placed shall not be less than 50 degrees F. In hot weather, all requirements of paragraph "Hot Weather Placing" of Section 03 31 00 CAST-IN-PLACE STRUCTURAL CONCRETE shall be met. In hot weather when the rate of evaporation of surface moisture, as determined by use of Figure 2.1.5 of

ACI 305R, may reasonably be expected to exceed 0.2 pounds per square foot per hour, make provisions for windbreaks, shading, fog spraying, or wet covering with a light-colored material in advance of placement, and such protective measures shall be taken as quickly as finishing operations will allow. Unformed surfaces that are not to be covered by additional concrete or backfill shall have a float finish, with additional finishing as specified below, and shall be true to the elevations shown on the Drawings. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown on the Drawings, properly consolidated, and left true and regular, unless otherwise indicated or directed. Unless otherwise shown on the Drawings, exterior surfaces shall be sloped for drainage. Joints shall be carefully made with a jointing or edging tool. The finished surfaces shall be protected from stains or abrasions. Grate tampers or "jitterbugs" shall not be used for any surfaces. The dusting of surfaces with dry cement or other materials or the addition of any water during finishing shall not be permitted. If bleed water is present prior to finishing, the excess water shall be carefully dragged off or removed by absorption with porous materials such as burlap. During finishing operations, extreme care shall be taken to prevent over finishing or working water into the surface, which can cause "crazing" (surface shrinkage cracks which appear after hardening) of the surface. Any slabs with surfaces which exhibit significant crazing shall be removed and replaced at no additional expense to the Owner. During finishing operations, surfaces shall be checked with a 10 foot straightedge, applied in both directions at regular intervals while the concrete is still plastic, to detect high or low areas.

3.3.2 Floated Finish

Screeding shall be followed immediately by darbying or bull floating before bleeding water is present to bring the surface to a true, even plane. No water, cement, or mortar shall be added to the surface during the finishing operation. After the concrete has stiffened so that it will withstand a person's weight without imprint of more than 1/4 inch and the water sheen has disappeared, it shall be floated to a true and even plane free of ridges. Perform floating by use of suitable hand floats or power driven equipment. Use sufficient pressure on the floats to bring a film of moisture to the surface. Hand floats shall be made of wood, magnesium, or aluminum. Concrete that exhibits stickiness shall be floated with a magnesium float. Care shall be taken to prevent over finishing or incorporating water into the surface.

3.3.3 Troweled Finish

Areas that cannot be float finished shall be given a trowel finish. After floating is complete and after the surface moisture has disappeared, unformed surfaces shall be steel troweled to a smooth, even, dense finish, free from blemishes, including trowel marks. In lieu of hand finishing, an approved power finishing machine may be used in accordance with the directions of the machine manufacturer. Additional troweling shall be performed, either by hand or machine until the surface has been troweled two times, with waiting periods between each. Care shall be taken to prevent blistering and, if such occurs, troweling shall immediately be stopped and operations and surfaces corrected. A final hard steel troweling shall be done by hand with the trowel tipped and using hard pressure when the surface is at a point that the trowel will produce a ringing sound. The finished surface shall be thoroughly consolidated and shall be essentially free of trowel marks and be uniform in texture and appearance. The concrete mixture used for troweled finished areas shall be adjusted, if necessary, in order to provide sufficient fines (cementitious material and fine sand) to finish properly.

END OF SECTION

SECTION 03 39 00

CONCRETE CURING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all cast-in-place structural concrete curing to be performed under this Contract, unless otherwise specified.

1.2 REFERENCES

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(2005; R 2009) Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats

ACI INTERNATIONAL (ACI)

ACI 301	(2005) Specifications for Structural Concrete
ACI 306.1	(1990) Standard Specification for Cold Weather Concreting
ACI 308.1	(1998) Standard Specification for Curing Concrete

ASTM INTERNATIONAL (ASTM)

ASTM C 171	(2007) Standard Specification for Sheet Materials for Curing Concrete
ASTM C 309	(2011) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 94/C 94M	(2011b) Standard Specification for Ready-Mix Concrete

1.3 SUBMITTALS

A. Submit manufacturer's literature, product data, and recommended instructions, including safety data sheets, for curing materials and compounds for approval prior to furnishing onsite.

B. Submit the proposed concrete curing and protection methods for approval prior to performing concrete curing operations.

C. Submit certified copies of laboratory test reports, including curing materials and compounds proposed for use on this project.

D. Submit certificates of compliance stating the curing materials and compounds are in compliance with all the specified requirements of these Contract Specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

Materials shall be stored in such a manner as to avoid contamination and deterioration. Materials shall be capable of being accurately identified after bundles or containers are opened.

PART 2 – PRODUCTS

2.1 CURING MATERIALS

2.1.1 Impervious Sheet

Impervious sheet materials shall conform to ASTM C 171, type optional, except polyethylene sheet shall not be used.

2.1.2 Membrane-Forming Compound

Membrane-forming curing compound shall conform to ASTM C 309, Type 1-D or 2. Non-pigmented compound shall contain a fugitive dye and shall have the reflective requirements in ASTM C 309 waived.

2.1.3 Burlap and Cotton Mat

Burlap and cotton mat used for curing shall conform to AASHTO M 182.

2.2 WATER

Water for curing shall be fresh, clean, potable, and free of injurious amounts of oil, acid, salt, or alkali, except that non-potable water may be used if it meets the requirements of ASTM C 94/C 94M.

PART 3 – EXECUTION

3.1 CURING AND PROTECTION

A. Concrete shall be cured as specified herein and in accordance with ACI 308.1 by an approved method for the minimum duration given below:

Type V Portland Cement or Equivalent	14 days

B. Immediately after placement, protect concrete from premature drying, extremes in temperatures, rapid temperature change, and mechanical injury for the duration of the curing period. Concrete shall be protected from the damaging effects of rain for 12 hours and from flowing water for 14 days. No fire or excessive heat, including welding, shall be permitted near or in direct contact with concrete or concrete embedments at any time. Maintain air and forms in contact with concrete at a temperature above 50 degrees F for the first 3 days and at a temperature above 32 degrees F for the remainder of the specified curing period. Heating units and accessories shall be placed and directed so as not to cause areas of overheating and drying of concrete surfaces or to create fire hazards. Materials and equipment needed for adequate curing and protection shall be available and at the site prior to placing concrete. Except as otherwise permitted by paragraph "Membrane-Forming Curing Compounds", moist curing shall be provided for any areas to be bonded.

C. Take necessary precautions to protect vertical faces of concrete and forms from premature drying due to exposure from direct sunlight. If necessary keep forms exposed to direct sunlight wet by spraying.

3.1.1 Moist Curing

Maintain concrete to be moist cured continuously wet for the entire curing period, commencing immediately after finishing. If water or curing materials stain or discolor concrete surfaces which are to be permanently exposed, the concrete surfaces shall be cleaned as approved by the Owner or their appointed representative. When wooden forms are left in place during curing, they shall be kept wet at all times. If steel forms are used in hot weather, non-supporting vertical forms shall be carefully broken loose from the concrete, soon after the concrete hardens, and curing water continuously applied into the void so as to continuously saturate the entire concrete surface. If the forms are removed before the end of the curing period, curing shall be carried out as on unformed surfaces, using suitable materials. Horizontal surfaces shall be cured by ponding, by continuous sprinkling, by continuously saturated burlap or cotton mats, or by continuously saturated plastic coated burlap. Burlap and mats shall be clean and free from any contamination and shall be completely saturated before being placed on the concrete. Provide an approved work system to ensure that moist curing is continuous 24 hours per day. Horizontal construction joints may be allowed to dry for 12 hours immediately prior to the placing of the following lift.

3.1.2 Membrane-Forming Curing Compounds

3.1.2.1 Application Restrictions

Membrane-forming curing compound will not be permitted on any surface to which a smooth finish is to be applied, and shall not be used on surfaces containing protruding steel reinforcement or surfaces that are to receive any subsequent treatment depending on adhesion or bonding to the concrete, such as additional concrete or sealers. Membrane-forming curing compound shall not be used on surfaces that are maintained at curing temperatures with free steam. Appearance is a primary consideration for exterior concrete surfaces exposed to view. The Contractor shall exercise extreme care to apply membrane-forming curing compound evenly on these surfaces. Variations in shade, color, or tint, resulting from uneven application of membrane-forming curing compound shall be repaired by and at the expense of the Contractor as directed by the Owner or their appointed representative.

3.1.2.2 Pigmented Curing Compound

A pigmented curing compound meeting the requirements of the above paragraph may be used on surfaces that will not be exposed to view when the project is completed.

3.1.2.3 Non-pigmented Curing Compound

A non-pigmented curing compound containing a fugitive dye may be used on surfaces that will be exposed to view when the project is completed. Concrete cured with non-pigmented curing compound must be shaded from the sun for the first three days when the ambient temperature is 90 degrees F or higher.

3.1.2.4 Application

Apply the curing compound to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment, except for the cleaning of loose sand, mortar, and debris from the surface in accordance with the manufacturer's written instructions, unless otherwise specified. The surfaces shall be thoroughly moistened with water and the curing compound applied as soon as free water disappears. The curing compound shall be applied to unformed surfaces as soon as free water has disappeared and bleeding has stopped. The curing compound shall be applied in a two-coat continuous operation by approved motorized power spraying equipment operating at a minimum pressure of 75 pounds per square inch, at a uniform coverage of not more than 400 square feet per gallon for each coat, and the second coat shall be applied perpendicular to the first coat. Concrete surfaces that have been subjected to rainfall within three hours after curing compound has been applied shall be re-sprayed by the method and at the coverage specified. All concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from pedestrian, equipment, and vehicular traffic and from any other cause that will disrupt the continuity of the curing membrane. After the curing period has elapsed, remove curing compound without damaging concrete surfaces by a method recommended by the curing compound manufacturer.

3.1.3 Impervious Sheeting

Only horizontal or nearly horizontal concrete surfaces may be cured using impervious sheets. However, except for plastic coated burlap, impervious sheeting alone shall not be used for curing. Surfaces shall be thoroughly wetted and be completely covered with the sheeting. Sheeting shall be at least 18 inches wider than the concrete surface to be covered. Covering shall be laid with light colored side up. Covering shall be lapped not less than 12 inches and securely weighted down or shall be lapped not less than 4 inches and taped to form a continuous cover with completely closed joints. The sheet shall be weighted to prevent displacement so that it remains in contact with the concrete during the specified length of curing. Coverings shall be folded down over exposed edges of slabs and secured by approved means. Sheets shall be immediately repaired or replaced if tears or holes appear during the curing period.

3.1.4 Ponding or Immersion

Concrete shall be continually immersed throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete.

3.1.5 Cold Weather Curing and Protection

Cold weather curing and protection shall be performed in accordance with ACI 306.1. When the daily ambient low temperature is less than 32 degrees F, maintain the temperature of the concrete above 40 degrees F for the first seven days after placing. During the period of protection removal, control the air temperature adjacent to the concrete surfaces so that concrete near the surface will not be subjected to a temperature differential of more than 25 degrees F as determined by suitable temperature measuring devices furnished by the Contractor, as required, and installed adjacent to the concrete surface and 2 inches inside the surface of the concrete. Perform the installation of thermometers as directed.

3.1.6 Hot Weather Curing and Protection

Hot weather curing and protection shall be performed in accordance with ACI 301.

3.2 TESTING AND INSPECTION

Perform the inspection and tests described below and, based upon the results of these inspections and tests, take the action required.

A. Moist Curing:

1. Moist Curing Inspections: At least once each shift, and not less than twice per day on work and non-work days, an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded.

2. Moist Curing Corrective Action: When a daily inspection report lists an area of inadequate curing, immediate corrective action shall be taken and the required curing period for those areas shall be extended by one day.

B. Membrane-Forming Curing:

1. Membrane Curing Inspection: No curing compound shall be applied until the Contractor has verified that the compound is properly mixed and ready for spraying. At the end of each operation, estimate the quantity of compound used by measurement of the container and the area of concrete surface covered, compute the rate of coverage in square feet per gallon, and note whether or not coverage is uniform.

2. Membrane Curing Corrective Action: When the coverage rate of the curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

C. Sheet Curing:

1. Sheet Curing Inspection: At least once each shift and once per day on non-work days, an inspection shall be made of all areas being cured using impervious sheets. The condition of the covering and the tightness of the laps and tapes shall be noted and recorded.

2. Sheet Curing Corrective Action: When a daily inspection report lists any tears, holes, or laps or joints that are not completely closed, the tears and holes shall promptly be repaired or the sheets replaced, the joints closed, and the required curing period for those areas shall be extended by one day.

END OF SECTION

SECTION 03 40 00

PRECAST CONCRETE STRUCTURES FOR BELOW GRADE INSTALLATION

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for fabrication and installation of precast concrete structures and the connection of piping to the precast structure.

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1.2 REFERENCES

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 211.1	(1991; R 2009) Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 318	(2014; Errata 1-2 2014; Errata 3 2015) Building Code Requirements for Structural Concrete and Commentary

ASTM INTERNATIONAL (ASTM)

ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C33/C33M	(2013) Standard Specification for Concrete Aggregates
ASTM C1107/C1107M	(2014a) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C443	(2011) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C877	(2008) External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
ASTM C891	(2011) Installation of Underground Precast Concrete Utility Structures
ASTM C920	(2014a) Standard Specification for Elastomeric Joint Sealants

NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA)

NPCA QC Manual	(2012) Quality Control Manual for Precast and Prestressed Concrete Plants

1.3 SUBMITTALS

A. Submit a drawing illustrating the construction of the precast structure, including reinforcement, concrete thicknesses, and locations for inserts and openings. Provide dimensions of the structure and dimensions from nearest edge to center locations of inserts and openings. Include information on handling and installation. Submit drawing to Owner or his appointed representative at least 14 days prior to delivery on site for approval.

1.4 SYSTEM DESCRIPTION

Furnish precast concrete units designed and fabricated by an experienced and acceptable precast concrete manufacturer who has been, for at least 3 years, regularly and continuously engaged in the manufacture of precast concrete work similar to that indicated on the drawings. Coordinate precast work with the work of other trades.

PART 2 – PRODUCTS

2.1 GENERAL

Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards including at a minimum, ACI, ASTM and NCPA. Design shall also consider stresses induced during handling, shipping and installation as to avoid product cracking or other handling damage. Indicate design loads for precast concrete units on the submittal drawings. Submit drawings for standard precast concrete units furnished by the precast concrete producer for approval by the Owner or his appointed representative in accordance with paragraph “Submittals”. The drawings shall demonstrate that the applicable industry design standards have been met. Produce precast concrete units in accordance with the approved drawings. Submit cut sheets, if applicable for standard precast concrete units, showing conformance to project drawings and requirements, and to applicable industry design standards listed in this specification.

2.2 CONCRETE MIX DESIGN

Select proportions for concrete, water to cement ratio, air content and admixtures in accordance with applicable industry codes and standards including at a minimum ACI, ASTM and NCPA. Precast concrete units shall possess a compressive strength of 4,000 psi upon delivery to the site.

2.3 PRECAST CONCRETE MATERIALS

Select cement, aggregates, admixtures, reinforcement, accessories, forms and water in accordance with applicable ASTM standards for the subject materials.

2.4 GROUT

Nonshrink Grout for filling the annulus space between precast concrete openings and pipe shall conform to ASTM C1107/C1107M. Cementitious grout shall be a mixture of portland cement, sand, and water. Portland cement grout shall conform to ASTM C150/C150M for Cement, Type I. Fine aggregates shall conform to ASTM C33/C33M. Proportion one part cement to approximately 2.5 parts sand, with the amount of water based on placement method.

2.5 RUBBER GASKETS AND SEALING BANDS

Rubber gaskets for manhole segments shall meet the requirements of ASTM C443 and shall possess a minimum pressure rating of 13 pounds per square inch. External sealing bands shall be ConSeal CS-212 Polyolefin Sealing bands or equal. The bands shall be a minimum of 0.10-inches thick and 24-inches wide and shall meet the requirements of ASTM C877.

2.6 LINK-SEAL® MODULAR SEALS

Modular seals for filling the annulus space between precast concrete openings and pipe shall be Link-Seal Model ‘C’ or ‘L’ manufactured by GPT Industries, Inc. (gptindustries.com) or an equivalent modular seal selected by the contractor and approved by the Owner or his appointed representative. The size of the seal shall be determined by the contractor, based upon the annulus opening size after pipe insertion and the thickness of the precast tank wall.

2.7 BACKFILL SOILS

Backfill soils placed and compacted around the precast structures shall meet the requirements in paragraph “Definitions” specified in Section 31 00 00 EARTHWORK.

PART 3 – EXECUTION

3.1 FABRICATION

Perform fabrication of precast concrete structures, including but not limited to construction of forms, placement and splicing of reinforcment, mixing and placing concrete, curing, finishing, and patching and repair in accordance with NPCA QC Manual and/or applicable ASTM or ACI standards unless specified otherwise.

3.2 VALVE STEM GUIDES

Position valve stem guide brackets at the embedded locations specified on the Drawings. Embed the brackets in accordance with the Manufacturer’s Installation Guide or as specified in Section 33 40 00 STORM DRAINAGE UTILITIES

3.3 EMBEDDED ITEMS

Position embedded items at locations specified in the design documents. Perform welding to position embedded items in accordance with AWS D1.1/D1.1M when necessary. Hold rigidly in place all inserts, plates, weldments, lifting devices and other items to be imbedded in precast concrete products so that they do not move significantly during casting operations. Submit product data sheets and proper installation instruction for anchors, lifting inserts and other devices. Clearly indicate the products dimensions and safe working load.

3.4 SUBGRADE PREPARATION

Perform Subgrade preparation for precast concrete structures in accordance with paragraph “Subgrade Preparation” in Section 31 00 00 EARTHWORK.

3.5 GENERAL AND STRUCTURAL EXCAVATION

Perform General and Structural Excavation for precast concrete structures in accordance with paragraph “General Excavation” and paragraph “Structural Excavation for Pipe and Concrete” in Section 31 00 00 EARTHWORK.

3.6 PRECAST STRUCTURE INSTALLATION

A. The Contractor's shall provide adequate access to the site to facilitate hauling, storage, proper handling and placement of the precast concrete structure.

B. Lift products by suitable lifting devices at points provided by the precast concrete producer’s installation guide. Verify that lifting points do not extend through the wall of the structure into the flowable area.

C. Install precast concrete products to the lines and grades shown in the contract documents or otherwise specified. Provide proper base material in a level condition and at the proper elevation. Install products, including rubber gaskets and/or sealing bands in accordance with the precast concrete producer's installation guide. In the absence of such instructions, install underground utility structures in accordance with ASTM C891.

D. Field modifications to the product will relieve the precast producer of liability even if such modifications result in the failure of the product.

3.7 BACKFILL AND COMPACTION AND TESTING

Perform backfilling, compaction and testing of soil adjacent to precast concrete structures in accordance with paragraph “Backfilling and Compaction” and paragraph “Testing” in Section 31 00 00 EARTHWORK.

3.8 CONNECTION OF ADJACENT PIPING

The contractor shall cut the three existing HDPE pipes at a location that allows the pipes to extend into the precast structure to facilitate installation of a flange and connection of a valve and tee, as shown on the Drawings. Care shall be taken during precast concrete structure installation to insert the pipes through the precast openings. Installation of all pipes shall be as shown on the drawings and in accordance with Section 33 40 00 STORM DRAINAGE UTILITIES.

3.9 GROUTING

A. Prepare annulus space for grouting by cleaning away foreign matter, laitance, dirt, grease or oil. Clean all contact surfaces of concrete and masonry no less than 24 hours before grout application.

B. Mix grout ingredients for both cementitious grout and epoxy grout in accordance with the manufacturer's written mixing instructions and recommendations. Mix grout materials in proper mechanical mixers and as close to work area as possible.

C. Place grout in accordance with the manufacturer's written installation instructions and recommendations. Do not use grout which has begun to set or if more than one hour has elapsed after initial mixing.

D. Protect freshly placed grout from premature drying and excessive cold or hot temperatures. Comply with manufacturer's requirements for cold-weather and hot-weather protection during curing.

3.10 MODULAR SEAL INSTALLATION

Install Link-Seal® modular seal in accordance with the manufacturer’s installation guide and reviewing the installation video available on the website (gptindustries.com).

END OF SECTION

SECTION 31 00 00

EARTHWORK (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for earthwork activities to be performed under this Contract including, but not limited to, embankment excavation, subgrade preparation, fill placement to raise the embankment, compaction, and testing of fill and lake bottom excavation.

1.2 REFERENCES

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 99	(2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop
AASHTO T 224	(2010) Correction for Coarse Particles in the Soil Compaction Test

ASTM INTERNATIONAL (ASTM)

ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D 1140	(2000; R 2006) Standard Test Method for Amount of Material in Soils Finer than the No. 200 (75-µm) Sieve
ASTM D 1556	(2007) Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 2216	(2010) Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 2487	(2011) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 422	(1963; R 2007) Standard Test Method for Particle-Size Analysis of Soils
ASTM D 4318	(2010) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4643	(2008) Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating

ASTM D 698	(2012) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D 6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 600/4-79/020	(1983) Methods for Chemical Analysis of Water and Wastes
EPA SW-846.3-3	(1999, Third Edition, Update III-A) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926	Safety and Health Regulations for Construction

1.3 SUBMITTALS

A. Contractor shall submit an Excavation Plan a minimum of 30 days prior to starting excavation operations. The plan shall describe the process for the safe excavating and hauling of soil material from the point of excavation to the final onsite placement or offsite disposal locations, fill placement and for the excavating and hauling of soil from the lake bottom, after dewatering, and stockpiling and soil drying as necessary. The equipment, materials, sequence, and procedures used in this process shall be presented, and shall include contingencies for controlling surface water and groundwater, excavating and hauling soft or wet soils, soft or wet access roads, and proper placement and compaction of soft or wet soils. The plan shall include drawings to identify areas to be excavated, stockpile areas, haul routes, and soil or rock placement areas and should reflect the most recent topography, the location of existing features and utilities to be protected, and the location of constructed features. The plan shall be reviewed for completeness by the Owner or appointed representative prior to commencement of excavation activities. No material may be disposed of offsite until the disposal locations and procedures have been reviewed. If necessary, modify the plan as required to meet actual field conditions, and the modifications shall be reviewed for completeness by the Owner or appointed representative prior to use.

B. Submit qualifications of the Contractor’s validated testing facilities for approval.

C. Within 24 hours of the completion of a quality control review of the physical geotechnical testing, submit four copies of test results, including calibration curves and results of calibration tests.

D. Submit performance records weekly for all dewatering operations.

E. Submit notice to the Owner or appointed representative at least 7 days in advance of the opening of any excavation or borrow area to permit elevations and measurements of the undisturbed ground surface to be taken, if not previously performed.

F. Submit the locations of borrow areas for approval prior to physical and chemical testing of the borrow source.

G. Submit analytical and environmental testing results of all offsite soils to obtain approval for "certified clean" status upon receipt from the laboratory.

H. Submit a Shoring, Sheeting, and Bracing Plan for approval 30 days prior to starting work, including drawings and calculations certified by a registered professional engineer licensed within the Commonwealth of Pennsylvania describing the methods for shoring, sheeting, and bracing of excavations. Approval of the plan shall be obtained prior to starting the work.

I. Submit a bi-weekly written report informing the Owner or their appointed representative of the status of the Shoring and Sheeting Plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems.

1.4 DEFINITIONS

1.4.1 Topsoil

Topsoil shall be defined as specified in paragraph "Topsoil" of Specification Section 32 92 19 SEEDING. Topsoil shall be free from subsoil, noxious weeds, stones larger than 1 inch in diameter, lime, cement, ashes, slag, coal, rocks, debris, stumps, roots, or other material considered objectionable by the Owner or appointed representative. Topsoil shall be well drained in its original position and free from toxic quantities of acid or alkaline elements.

1.4.2 Existing Fill

Existing fill is defined as previously placed, mechanically transported materials. Existing fill is suitable for reuse as new fill if properly placed and compacted as specified herein. This material shall not be used to support structural foundations. Existing fill may be too saturated in its current condition to be properly placed as new fill and may require remedial efforts by the Contractor to dry the material to within adequate moisture contents for placement. Remedial drying efforts shall be designed by the Contractor and approved by the Owner or appointed representative prior to implementation.

1.4.3 Colluvial Soil

Colluvial soil is defined as soil and rock that is deposited down slope by gravity and erosion. Colluvial soil is suitable for reuse as new fill if properly placed and compacted as specified herein.

1.4.4 Residual Soil

Residual soil is defined as bedrock that has decomposed due to chemical or physical weathering. Residual soil may retain relic structures and characteristics of the underlying parent bedrock, such as bedding planes, but is soft enough to be penetrated by a split-spoon sampler. Medium dense to dense and stiff to hard residual soils are suitable for reuse as new fill and can support structures if properly placed and compacted as specified herein. Very soft to soft residual soils shall not be used to support structural foundations.

1.4.5 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation that is performed merely to increase production. Large boulders within the excavation limits that are too hard to break down into smaller reusable pieces shall be removed and disposed of offsite, unless otherwise approved by the Owner or appointed representative. Soft cohesive material often present around boulders shall be removed and disposed of offsite, unless otherwise approved by the Owner or appointed representative. Excavation by hand may be required between boulders to remove the soft cohesive material.

1.4.6 Satisfactory Materials

Satisfactory materials for use as fill material in construction, except for structural cohesive fill for use as earthen dam embankment material shall be existing fill, colluvial soil, or residual soil as specified herein, or shall be comprised of soil and rock classified by ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM, SC, ML, or CL and meeting the requirements specified herein. Satisfactory materials for fill shall be comprised of material less than 6 inches in any dimension, except for fill material directly beneath structures shall be comprised of material less than 3 inches in any dimension. Satisfactory materials for structural cohesive fill shall be as specified in paragraph “Structural Cohesive Fill”. Satisfactory material to be used for embankment construction beyond the base embankment section shall be classified by ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM or SC.

1.4.7 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory, unless otherwise specified, including carbonaceous shale and coal. Unsatisfactory materials also include man-made fills; trash; refuse; and material classified as satisfactory which contains root and other organic matter or frozen material. Unsatisfactory earthen materials shall be disposed of offsite or at locations approved by the Owner or appointed representative, unless otherwise directed or specified. The Contractor shall notify the Owner or appointed representative when encountering any chemically contaminated materials. Trash or other debris shall be disposed of at a properly permitted, commercially available disposal facility for the type of material being disposed of.

1.4.8 Unstable Material

Unstable materials are too wet to properly support appurtenant structures.

1.4.9 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are non-plastic. Perform testing required for classifying materials in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.4.10 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 698, abbreviated as a percent of laboratory maximum density. Since ASTM D 698 applies only to soils that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, express the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve as a percentage of the maximum density in accordance with AASHTO T 99 and corrected with AASHTO T 224.

1.5 SYSTEM DESCRIPTION

Subsurface soil boring logs are shown on the Drawings. This data represents the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.5.1 Classification of Excavation

Excavation shall be classified in accordance with the following designations and classifications.

1.5.1.1 Common Excavation

Include common excavation with the satisfactory removal and disposal or reuse of all materials not classified as over-excavation or rock excavation.

1.5.1.2 Over-Excavation

Include over-excavation with the satisfactory removal and offsite disposal of all coal and carbonaceous shale as specified in paragraph “Definitions”.

1.5.2 Blasting

Blasting shall not be permitted.

PART 2 – PRODUCTS

2.1 REQUIREMENTS FOR OFFSITE SOILS

To classify soils as “certified clean”, test offsite soils brought in for use as fill for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX), and full Toxicity Characteristic Leaching Procedure (TCLP), including ignitability, corrosivity, and reactivity. Fill shall contain a maximum of 100 parts per million (ppm) of TPH and a maximum of 10 ppm of the sum of BTEX and shall pass the TCLP test. Determine TPH concentrations by using EPA 600/4-79/020, Method 418.1. Determine BTEX concentrations by using EPA SW-846.3-3, Method 5030/8020. Perform TCLP in accordance with EPA SW-846.3-3, Method 1311. Do not bring material onsite until tests have been approved by the Owner or appointed representative.

2.2 STRUCTURAL COHESIVE FILL

Structural cohesive fill for the base embankment section shall be comprised of a low-permeability cohesive material classified by ASTM D 2487 as ML, CL, or ML-CL and suitable for earthen dams. If structural cohesive fill of varying permeabilities are furnished, the more impervious materials shall be placed on the impoundment side of the embankment and the more pervious materials on the landside of the embankment.

2.3 TOPSOIL

Topsoil shall be as specified in Section 32 92 19 SEEDING.

2.4 SATISFACTORY MATERIAL

Satisfactory materials used as backfill shall meet the requirements of paragraph “Satisfactory Materials”.

2.5 COMPACTION EQUIPMENT

Compaction equipment shall conform to the following requirements and shall be used as prescribed in subsequent paragraphs.

2.5.1 Sheepsfoot or Tamping Rollers

A. Towed – Tamping rollers shall consist of two or more non-vibratory roller drums with rectangular or square shaped boots of equal size, proper spacing, bearing surface and flatness and proper height. The drums shall be mounted side-by-side in a suitable frame and towed by either a crawler-type or rubber-tired tractor having sufficient power to pull the roller satisfactorily when the drums are fully ballasted. Each drum shall be free to pivot about an axis parallel to the direction of travel. Rollers operated in tandem sets shall be controlled in a manner such that the prints produced by the tamping feet of the tandem units are staggered. If more than one roller is used on any one layer of fill, then all rollers so used shall be of the same type and essentially of the same dimensions. Rollers shall be drawn by crawler-type or rubber-tired tractors at a speed not to exceed 5.0 miles per hour. The use of rubber-tired towing equipment shall be discontinued if the tires leave ruts that prevent uniform compaction by the tamping roller and the substitution of crawler-type towing equipment may be directed.

B. Self-propelled – Self-propelled tamping rollers shall consist of non-vibratory two or three drum side by side units that are either in a drive position or drawn by separate power equipment. Two- or four-drum equipment separated by cab and differential and arranged in tandem must have its static weight equally distributed to all compaction drums and must have the tandem drums positioned such that the prints of the tamping feet produced by the tandem drums are staggered.. For self-propelled rollers in which steering is accomplished through the use of rubber-tired wheels, the tire pressure shall not exceed 40 pounds per square inch. The use of the compactor shall be discontinued if the tires leave ruts that prevent uniform compaction by the tamping roller and the substitution of appropriate towed tamping rollers may be directed. When a self-propelled roller is provided with a dozer blade, coverages made with the blade in operation shall not be counted as compaction coverages. Self-propelled rollers shall be operated at a speed not to exceed 5.0 miles per hour. If use of self-propelled tamping rollers causes shearing of the fill, laminations in the fill, or results in inadequate compaction, the Owner or appointed representative may recommend modifications to the tamping feet or variations in roller drum weight where applicable to achieve required compaction or that such rollers be removed from the fill and that appropriate towed tamping rollers be used.

2.5.2 Vibratory Rollers

Vibratory rollers shall be equipped with a smooth steel compaction drum and shall be operated at a frequency of vibration during compaction operations between 1,100 and 1,500 vibrations per minute. Vibratory rollers may be either towed or self-propelled and shall have an unsprung drum weight that is a minimum of 60 percent of the rollers’ static weight. Towed rollers shall have at least 90 percent of their weight transmitted to the ground through the compaction drum when the roller is standing in a level position hitched to the towing vehicle. Vibratory rollers shall have a minimum static weight of 8,000 pounds, a minimum dynamic force of 16,000 pounds when operating at 1,400 vibrations per minute, and an applied force not less than 5,000 pounds nor greater than 9,000 pounds per foot of compaction drum length. The level of amplitude and vibration frequency during compaction will be maintained uniform throughout the embankment within which it is operating. Rollers shall be operated at speeds not to exceed 1.5 miles per hour. The equipment manufacturer shall furnish sufficient data, drawings, and computation for verification of the above specifications, and the character and efficiency of this equipment shall be subject to approval.

2.5.3 Rubber-Tired Rollers

Rubber-tired rollers shall have a minimum of four wheels equipped with pneumatic tires. The tires shall be of such size and ply as can be maintained at tire pressures between 80 and 100 pounds per square inch for a 25,000 pound wheel load during rolling operations. The roller wheels shall be located abreast and be so designed that each wheel will carry approximately equal load in traversing uneven ground. The spacing of the wheels will be such that the distance between the nearest edges of adjacent tires will be greater than 50 percent of the tire width of a single tire at the operating pressure for a 25,000 pound wheel load. The roller shall be provided with a body suitable for ballast loading such that the load per wheel may be varied, from 18,000 to 25,000 pounds. The roller shall be towed at speeds not to exceed 5 miles per hour. The character and efficiency of this equipment shall be subject to approval.

2.5.4 Power Tampers

Compaction of material in areas where it is impracticable to use a roller or tractor shall be performed by the use of approved power tampers.

PART 3 – EXECUTION

3.1 STRIPPING OF TOPSOIL

Strip topsoil to a minimum depth of 4 inches. Transport and deposit in stockpiles for reuse or disposal as specified in Specification Section 32 92 19 SEEDING. Keep topsoil separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 1 inch in diameter, and other materials that would interfere with planting and maintenance operations. Stockpile in locations approved by the Owner or appointed representative.

3.2 GENERAL EXCAVATION

A. The Contractor shall perform excavation of every type of material encountered within the limits of the Project to the lines, grades, and elevations indicated on the Drawings or as directed by the Owner or appointed representative. Perform the grading in accordance with the typical sections shown and the tolerances specified in paragraph “Finishing”. Transport satisfactory excavated materials and place as fill at proposed locations within the limits of the work, or stockpile for reuse in locations approved by the Owner or appointed representative.

B. The Contractor shall excavate unsatisfactory materials encountered within the limits of the embankment, spillway, lake, and forebay a minimum of 3 feet below structure lines and replace with soil materials as specified in paragraph “Definitions”. The Contractor shall excavate unsatisfactory materials encountered within the limits of the riser structure foundation slab and replace with soil materials as specified in paragraph “System Description”. Dispose of unsatisfactory excavated material offsite or at locations approved by the Owner or appointed representative. During construction, perform excavation and fill placement in a manner and sequence that will provide proper drainage at all times.

C. The Contractor shall excavate satisfactory material from designated and approved borrow areas and place as fill in areas where the quantity of fill generated by excavation within the grading limits is insufficient.

D. Excavating and hauling of soil and rock material from the point of excavation to the final onsite placement or offsite disposal locations, or to a temporary stockpile location shall be done in a safe manner using equipment appropriate for the activity. Excavating and hauling equipment shall be operated in accordance with the equipment operating manual.

3.2.1 Excavation Plan

The Contractor shall perform excavation in accordance with the approved Excavation Plan prepared as described in paragraph "Submittals". The Contractor shall evaluate the moisture content of the excavated material to determine the most efficient and cost-effective methods to excavate, load, haul, stockpile, and place for compaction or dispose of the material. The Contractor may stage, grade, or windrow material within the Contractor work limits to adjust moisture content. The Contractor shall implement measures during hauling to prevent spillage of material on roadways used for material hauling. Excavations shall be performed in accordance with OSHA Standard Regulation 29 CFR 1926, Subpart P.

3.2.2 Swales and Ditches

Finish excavation of swales and ditches by cutting accurately to the cross sections, grades, and elevations shown on the Drawings. Do not excavate swales and ditches below grades shown. Dispose of excavated material offsite or at locations onsite approved by the Owner or appointed representative. Material shall not be deposited within 4 feet from edge of a swale or ditch. Remove detrimental quantities of leaves, brush, sticks, trash, and other debris from swale and ditch excavations until final acceptance of the work. Seeding of the swales shall be in accordance with Section 32 92 19 SEEDING.

3.2.3 Drainage

The Contractor shall manage surface and subsurface water encountered during excavation. Completely drain the construction site during periods of excavation to keep soil materials sufficiently dry. Construct storm drainage features at the earliest stages of site development. Throughout construction, grade the construction area to provide positive surface water runoff away from the construction activity. Use temporary ditches, swales, and other drainage features and equipment required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new satisfactory material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions present and to employ necessary measures to permit excavation to proceed.

3.2.4 Groundwater Control

Upon completion of lake drawdown and stream rerouting in accordance with Section 02 41 00 DEMOLITION, DECONSTRUCTION AND DEWATERING, the contractor shall control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls or heave in the excavation. Take control measures by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, maintain the water level continuously.

3.2.5 Underground Utilities

The Contractor is responsible for movement of construction machinery and equipment over pipes and utilities during construction. Perform work in the vicinity or directly adjacent to utilities in accordance with procedures outlined by the utility owner. Excavation made with power-driven equipment is not permitted within two feet of known utility or subsurface construction. For work immediately adjacent to, or for, excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the Contract excavation until approval for backfill is granted by the Owner or appointed representative. Immediately report damages to utility lines or other subsurface constructions to the Owner or appointed representative.

3.2.6 Structural Excavation

Excavations for structures shall conform to the dimensions and elevations indicated for each structure, except as specified hereinafter, and shall include excavation for foundation bedding and drainage systems and all work incidental thereto. Excavation shall extend a sufficient distance from the walls and foundations to allow for placement and removal of forms. Satisfactory material removed below the depths indicated without specific direction of the Owner or appointed representative shall be replaced at no additional cost to the Owner and backfilled with satisfactory material. Over-excavation below required elevations or bottoms of foundations shall be backfilled as specified herein. No foundations shall be constructed on unsatisfactory material as determined by the Owner or appointed representative. Excessively wet and/or soft material in subgrades resulting from water ponding in foundation excavations shall be removed and replaced with satisfactory material compacted to the density of the surrounding undisturbed material. Ensure that foundation subgrades have been inspected and approved by the Owner or appointed representative prior to concrete placement.

3.2.7 Slopes and Surcharges

Temporary excavation slopes shall not be steeper than shown on the Drawings or allowed by OSHA Standard Regulation 29 CFR 1926, Subpart P, and subject to the approval of the Owner or appointed representative. This may be accomplished by benching the temporary slope so that the average slope is not steeper than the specified slope. In addition, no temporary, permanent, or construction slope shall be surcharged with excavated or stockpiled material or with heavy construction equipment which would have the same effect as the surcharge material. The toe of stockpiled material shall be maintained a minimum distance back from the top of the finished excavation equal to the depth of the excavation. Determine the maximum height of such stockpile without causing instability of the excavation slope. Any slide or other adverse conditions caused by failure of the Contractor to maintain these conditions shall be considered the responsibility of the Contractor and remedial measures shall be at the Contractor's expense.

3.2.8 Existing Earthen Dam

The existing earthen dam shall be protected to the maximum extent possible during construction. Excavation within the existing embankment shall be limited to those areas shown on the Drawings to raise the embankment, construct the spillway control section and cutoff wall and to install the principal spillway pipe, unless otherwise approved by the Owner or appointed representative.

3.3 SHORING, SHEETING, AND BRACING

3.3.1 General Requirements

The Contractor shall design, furnish, and install shoring, sheeting, and bracing as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Shoring, sheeting, and bracing shall be adequately designed and properly installed to withstand anticipated loads. All shoring, sheeting, and bracing shall be removed as backfill operations progress and in a manner to prevent caving. The Contractor shall be cognizant of the proximity to top of rock based on the boring logs shown on the Drawings and shall design shoring, bracing, and sheeting with proximity to top of rock in mind.

3.3.2 Geotechnical Engineer

Hire a registered professional geotechnical engineer licensed within the Commonwealth of Pennsylvania to provide inspection of excavations and soil/groundwater conditions throughout construction. The geotechnical engineer shall be responsible for performing preconstruction and periodic site visits throughout construction to assess site conditions. The geotechnical engineer is responsible for updating the Excavation and Sheeting and Shoring Plans as construction progresses to reflect changing conditions and submit updated plans if necessary. The Owner or appointed representative may arrange meetings with the geotechnical engineer at any time throughout the Contract duration.

3.4 UTILIZATION OF EXCAVATED MATERIALS

Dispose of unsatisfactory materials removed from excavations offsite or at locations approved by the Owner or appointed representative, unless otherwise directed. Use satisfactory material removed from excavations, insofar as practicable, in the construction of the earthen embankments, fill, or backfill, and for similar purposes. Do not waste any satisfactory excavated material without specific written authorization. Dispose of excess satisfactory material, authorized to be wasted, offsite or at locations approved by the Owner or appointed representative, unless otherwise directed. Grub newly designated waste areas before disposal of material thereon. Stockpile and use coarse rock from excavations for constructing slopes or embankments adjacent to streams, or sides and bottoms of channels, and for protecting against erosion. Do not dispose excavated material to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.5 GRADING AREAS AND STOCKPILES

Divide work into grading areas within which satisfactory excavated material will be placed in embankments, fills, and required backfills. Place and grade stockpiles of satisfactory and unsatisfactory materials as specified. Stockpiles shall be kept in a neat and well drained condition, while giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources. Upon the completion of construction, all remaining stockpiled material shall be disposed of offsite at an approved disposal facility and the stockpile locations reclaimed to preconstruction conditions to the satisfactory of the Owner or appointed representative.

3.6 FINAL GRADE OF SURFACES TO SUPPORT CONCRETE

Do not excavate to final grade until just before concrete is to be placed. Only use excavation methods that will leave the foundation in a solid and unshattered condition. Roughen the level surfaces and cut the sloped surfaces into rough steps or benches to provide a satisfactory bond. Protect shales from slaking and all surfaces from erosion resulting from ponding or water flow.

3.7 GROUND SURFACE PREPARATION

3.7.1 General Requirements

A. Remove and replace unsatisfactory material with satisfactory materials, as directed by the Owner or appointed representative, in surfaces to receive fill or in excavated areas. Scarify the surface to a depth of 6 inches before the fill is started. Plow, step, bench, or break up sloped surfaces steeper than one vertical to four horizontal so that the fill material will bond with the existing material. When subgrades are less than the specified density, break up the ground surface to a minimum depth of 6 inches, pulverizing and compacting to the specified density. When the subgrade is part fill and part excavation or natural ground, scarify the excavated or natural ground portion to a depth of 12 inches and compact it as specified for the adjacent fill.

B. Earthen dam ground surface preparation shall be in accordance with paragraph “Earthen Dam”.

3.7.2 Frozen Material

Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Materials which cannot be compacted by roller equipment because of inadequate clearances shall be compacted with power tampers. Moisten material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used, but shall not exceed the moisture contents specified herein.

3.8 SUBGRADE PREPARATION

3.8.1 Construction

A. Shape subgrade to the lines, grades, and cross sections, and compact as specified. Include plowing, disking, and any moistening or aerating required to obtain specified compaction for this operation. Remove soft or otherwise unsatisfactory material and replace with satisfactory material or other approved material as directed. Bring up low areas resulting from removal of unsatisfactory material to required grade with satisfactory materials, and shape the entire subgrade to lines, grades, and cross sections and compact as specified. After rolling, do not show deviations for the surface of the subgrade greater than 1/2 inch when tested with a 12 foot straightedge applied both parallel and at right angles to the centerline of the area. Do not vary the elevation of the finished subgrade more than 0.05 feet from the established grade and cross section.

B. Earthen dam subgrade preparation shall be in accordance with paragraph “Earthen Dam”.

3.8.2 Compaction

Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory rollers, or other approved equipment. Materials which cannot be compacted by roller equipment because of inadequate clearances shall be compacted with power tampers. Compact each layer in accordance with paragraph “Backfilling and Compaction”.

3.9 EARTHEN DAM EMBANKMENT RAISE

3.9.1 Construction

A. Place Structural Cohesive Fill to construct the base embankment section to the lines, grades, and cross sections indicated, unless otherwise directed. The Owner reserves the right to increase or decrease the fill foundation widths or the embankment slopes or make such other changes in the embankment sections as may be deemed necessary to produce a safe structure. Increases in height of section, made to compensate for shrinkage or consolidation of the embankment material subsequent to the completion of the embankment, will not exceed five percent of the height above the existing fill foundation.

B. Place Satisfactory Material adjacent to the Structural Cohesive Fill of the base embankment section to the lines, grades, and cross sections indicated, unless otherwise directed to final proposed side slopes of the embankment.

C. Maintain and protect the Structural Cohesive Fill and the Satisfactory entire embankment in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. If, in the opinion of the Owner or appointed representative, the hauling equipment causes horizontal shears or slick sides, rutting, quaking, heaving, cracking or excessive deformation of the embankment, limit the type, load, or travel speed of the hauling equipment on the embankment. Any approved embankment material which is lost in transit or rendered unsuitable after being placed in the embankment, and before final acceptance of the work, shall be replaced in a satisfactory manner and no additional payment will be made. Excavate and remove from the embankment, any material which the Owner or appointed representative considers objectionable, dispose of such material, and refill the excavated area as directed, all at no cost to the Owner. The Contractor may be required to remove, without additional payment, any embankment material placed outside of prescribed slope lines.

3.9.2 Foundation Preparation

A. After removal of roots, vegetation or other debris turned up in the process of clearing and grubbing the embankment crest areas as indicated on the drawings, remove all soft or loose material and any visible unsatisfactory material. The remaining surface of the section shall be loosened by scarifying, plowing, disking or harrowing to a minimum depth of 6 inches and the moisture content shall be adjusted as specified for the appropriate type of material. No separate payment will be made for loosening and rolling the foundation area, but the entire cost thereof shall be included in the applicable contract price for structural cohesive fill.

3.9.3 Fill Placement

A. No fill shall be placed on any part of the embankment foundation until such areas have been inspected and approved. The gradation and distribution of materials throughout the compacted earth fill section of the dam shall be such that the embankment will be free from lenses, pockets, streaks, and layers of material differing substantially in texture or gradation from surrounding material. Successive loads of material shall be dumped at locations on the fill as directed or approved. No fill shall be placed upon a frozen surface, nor shall snow, ice, or frozen earth be incorporated in the embankment.

B. No fill shall be placed on a foundation which contains frozen material, or which has been subjected to freeze-thaw action. This prohibition encompasses all foundation types, including the natural ground, all prepared subgrades whether in an excavation or on an embankment, and all layers of previously placed and compacted earth fill which become the foundations for successive layers of earth fill. All material that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, or winter shutdowns or earthwork operations, shall be removed to a depth that is acceptable to the Owner or appointed representative and replaced with new material. Alternatively, the material shall be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. The Owner or appointed representative will determine when placement of fill shall cease due to cold weather. The Owner or appointed representative may elect to use average daily air temperatures, and/or physical observation of the soils for determination. Embankment material shall not contain frozen clumps of soil, snow, or ice.

C. Unless otherwise directed, fill placement to raise the embankment shall be maintained at approximately the same level regardless of the materials being placed.

D. Foundations receiving fills shall be kept thoroughly drained. Placing operations shall be such as to avoid mixing of adjacent differing materials as much as practicable, but provide sufficient bonding.

E. Equipment traffic on the embankment shall be routed to distribute the compactive effort as much as practicable. Ruts formed in the surface of any layer of spread material shall be filled before that material is compacted. If, in the opinion of the Owner or appointed representative, the compacted surface of any layer of material is too smooth to bond properly with the succeeding layer, the surface shall be loosened by scarifying or other approved methods before material from the succeeding layer is placed.

3.9.4 Moisture Control

A. The materials in each layer of the fill shall contain the amount of moisture within the specified limits, or as directed, necessary to obtain the specified compaction. Material that is not within the specified limits after compaction shall be reworked, regardless of density.

B. The moisture content after compaction shall be as uniform as practicable throughout any one layer of fill material. The moisture content after compaction as determined by ASTM D 2216 shall be within the specified limits. Material that is too wet shall be spread on the embankment and permitted to dry, assisted by discing or harrowing, if necessary, until the moisture content is reduced to an amount within the specified limits. When the material is too dry, the Contractor will be required to sprinkle each layer on the fill. Harrowing or other approved methods will be required to work the moisture into the material until a uniform distribution of moisture is obtained. Water applied on a layer of fill shall be accurately controlled in amount so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the embankment, so that the material is too wet to obtain the desired compaction, the rolling on that section of the embankment shall be delayed until the moisture content of the material is reduced to an amount within the specified limits. If it is impracticable to obtain the specified moisture content by wetting or drying the material on the fill, the Contractor may be required to pre-wet or pre-dry back the material at the sources of excavation. If, in the opinion of the Owner or appointed representative, the top or contact surfaces of the fill section become too dry to permit suitable bond between these surfaces and the additional fill to be placed thereon, loosen the dried materials by scarifying or discing to such depths as may be directed; dampen the loosened material to an acceptable moisture content; and compact this layer in accordance with the applicable requirements to densities comparable to the underlying embankment.

3.9.5 Compaction

A. After a layer of fill material has been dumped and spread, it shall be harrowed if required, to break up and blend the fill materials, unless harrowing is performed to obtain uniform moisture distribution. Harrowing shall be performed with a heavy disc plow, or other approved harrow, to the full depth of the layer. If one pass of the harrow does not accomplish the breaking up and blending of the materials, additional passes of the harrow may be required, but in no case will more than three passes of the harrow on any one layer be required for this purpose. When the moisture content and the condition of the layer is satisfactory, the lift shall be compacted to the specified criteria in paragraph "Backfilling and Compaction" prior to placement of the next layer. Determination of in-place density shall be in accordance with ASTM D 6938. A complete coverage shall consist of the coverage of the entire lift to be compacted with the roller specified. Portions of the fill which are not accessible to the roller because of inadequate clearances shall be placed in 4 inch loose layers and compacted with power tampers to a degree equal to that obtained on the other portions of the compacted fill by rolling as specified. Dumping, spreading, sprinkling, and compacting may be performed at the same time at different points along a section when there is sufficient area to permit these operations to proceed simultaneously.

B. If, in the opinion of the Owner or appointed representative, the desired compaction of any portion of the embankment is not secured by the minimum number of coverages specified, additional complete coverages shall be made over the surface area of such designated portion until the desired compaction has been obtained.

3.9.6 Slides

In the event of slides in any part of the embankment prior to final acceptance of the work, remove material from the slide area, as directed, and rebuild such portion of the embankment. In case it is determined that the slide was caused through the fault of the Contractor, the removal and disposal of material and the rebuilding of the embankment shall be performed without cost to the Owner.

3.10 LAKE EXCAVATION

A. The Contractor shall excavate and haul sediment from within the lake area, to the limits shown on the drawings, from the point of excavation to access ramps prepared by the contractor extending out of the lakebed area. During excavation, the Contractor shall evaluate the moisture content of the excavated sediment to determine the most efficient and cost-effective method to reduce the moisture content prior to loading.

B. Lake excavation may be divided into quadrants to utilize areas for additional sediment drainage.

C. Excavation equipment shall possess the necessary low ground contact pressure to reduce the potential for sinking into sediment. Mud mats or any equivalent pressure distribution mechanism shall be utilized if necessary

D. The Contractor shall implement measures needed to remove water from the void spaces of the sediment after the free water has been drained, thereby reducing the time required to dry the sediment. Excavation of sumps shall be permitted. Staging, grading, tarping and/or windrowing material shall be performed within the Contractor work limits to adjust moisture content. The Contractor shall implement measures during hauling to prevent spillage of sediment on roadways used to access the disposal areas.

E. Access ramp locations shall be selected by the Contractor.

F. Use caution when excavating and hauling soft or wet soils and when driving on soft or wet access roads.

G. Placement and compaction of sediment shall be performed at locations designated by the Owner's Representative when moisture content is less than 20%. Moisture content after compaction shall be as determined by ASTM D 2216. Compact material to the specified criteria in paragraph "Backfilling and Compaction" prior to placement of the next layer.

3.11 BACKFILLING AND COMPACTION

A. Place satisfactory fill materials as controlled and well compacted fills in loose lifts not exceeding 8 inches thick, except within 4 feet of structures the loose lift thickness shall be reduced to 6 inches or as otherwise specified.

B. Structural cohesive fill for use as earthen dam material shall be compacted to a minimum 95 percent laboratory maximum density in accordance with paragraph "Degree of Compaction" and shall be within 3 percent of the optimum moisture content.

C. Backfills with satisfactory materials shall be compacted to at least 90 percent laboratory maximum density and cohesionless backfills shall be compacted to at least 95 percent laboratory maximum density in accordance with paragraph "Degree of Compaction" to prevent wedging action or eccentric loading upon, or against, the structure. All backfill material shall be within 3 percent of the optimum moisture content.

D. Coarse base aggregate, coarse aggregate fill, and coarse aggregate filter materials shall be backfilled and compacted in accordance with Specification Section 31 05 16 AGGREGATES FOR EARTHWORK.

E. All fill shall be compacted to non-movement under the weight of the compaction equipment.

F. Adjustments to the soil moisture content shall be performed by wetting or drying as required.

G. Prepare ground surface on which fill or backfill is to be placed and provide compaction requirements in conformance with paragraph "Ground Surface Preparation". Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

H. After concrete structures have been constructed and the concrete has been allowed to adequately cure, place fill and backfill in such a manner that the structures are not be damaged by the shock of falling earth. Deposit the material, compact as specified, and bring up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.12 SELECTION OF BORROW MATERIAL

Select borrow material to meet the requirements and conditions of the particular fill for which it is to be used. Obtain borrow material from the borrow areas selected by the Contractor and approved by the Owner or appointed representative. The Contractor is responsible for obtaining the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling from the owners of the borrow areas. Unless specifically provided, do not obtain borrow from within the limits of the project site without prior written approval. Consider necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon related operations to the borrow excavation. The Contractor shall be responsible for performing testing in accordance with paragraph “Requirements For Offsite Soils” and obtaining all required permits for the borrow source.

3.13 FINISHING

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Provide the degree of finish for graded areas within 0.10 feet of the grades and elevations indicated, except that the degree of finish for subgrades specified in paragraph "Subgrade Preparation". Finish swales and ditches in a manner that will result in effective drainage. Finish the surface of areas to be seeded from settlement or washing to a smoothness suitable for the application of seeding materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and reestablish grades to the required elevations and slopes.

3.13.1 Subgrade and Embankments

During construction, keep embankments and excavations shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition until fill placement over the subgrade is complete. Do not permit the storage or stockpiling of materials on the finished subgrade. Do not place fill material until the subgrade has been checked and approved, and in no case place fill material on a muddy, spongy, or frozen subgrade.

3.13.2 Grading Around Structures

Construct areas within 5 feet of concrete structures true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

3.14 PLACING TOPSOIL

Place topsoil in accordance with Section 32 92 19 SEEDING.

3.15 TESTING

Testing shall be performed by the approved Contractor’s validated testing facilities.

A. Determine field in-place density in accordance with ASTM D 6938. Check the calibration curves and adjust using only the sand cone method as described in ASTM D 1556. ASTM D 6938 results in a wet unit weight of soil in determining the moisture content of the soil when using this method.

B. Check the calibration curves furnished with the moisture gauges along with density calibration checks as described in ASTM D 6938; check the calibration of both the density and moisture gauges at the beginning of project on each different type of material encountered and at intervals as directed by the Owner or appointed representative. When test results indicates compaction is not as specified, as determined by the Owner or appointed representative, remove the material, replace, and re-compact to meet specification requirements.

C. Perform tests on re-compacted areas to determine conformance with specification requirements. Appoint a registered professional civil engineer licensed within the Commonwealth of Pennsylvania to certify inspections and test results. Certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.15.1 Soil Classification Tests

Soil classification tests shall be performed in accordance with ASTM D 2487. One initial classification test shall be required for each different classification of material to be utilized as fill or backfill. As prescribed in ASTM D 2487, grain size analyses in accordance with ASTM D 422 and Atterberg limits in accordance with ASTM D 4318 shall be performed on each different classification. Submit additional tests for every 1,000 cubic yards of material. Soil classification tests shall be performed on foundation material as required to determine the acceptability of the in-situ soils. Additional tests will be required if noticeable changes in the material occur.

3.15.2 Fill and Backfill Material Gradation

One initial gradation test shall be required for each different classification of material to be utilized as fill or backfill. Submit additional gradation tests for every 1,000 cubic yards of material. Determine gradation of fill and backfill material in accordance with ASTM C 136, ASTM D 422, or ASTM D 1140 as applicable.

3.15.3 In-Place Densities

Two in-place density tests shall be performed on each lift of fill placed or every 500 cubic yards of fill placed to monitor the degree of compaction in accordance with ASTM D 6938.

3.15.4 Check Tests on In-Place Densities

Densities shall be check tested in accordance with ASTM D 1556 for every 10 in-place density tests performed in accordance with ASTM D 6938.

3.15.5 Moisture Contents

Determination of moisture content shall be performed in accordance with ASTM D 2216. ASTM D 4643 may be used when rapid moisture content results are needed. All rapid results obtained by ASTM D 4643 shall be confirmed by a test on a duplicate sample performed in accordance with ASTM D 2216. In the event of disagreement between the results, ASTM D 2216 shall govern. One moisture content test shall be performed for each 500 cubic yards of material placed or each lift of material whichever is less. These tests shall be in addition to the moisture content tests performed in conjunction with in-place density tests. Material not meeting the required specifications for moisture content shall be retested after corrective measures have been applied. A minimum of two tests per day per type of material or source of material being placed shall be performed during stable weather conditions. During unstable weather, perform tests as dictated by local conditions and approved by the Owner or appointed representative.

3.15.6 Moisture-Density Relationships

The moisture-density relationships for each different classification of material utilized shall be determined in accordance with ASTM D 698. Prior to placing any fill material containing cohesive material, a minimum of two (5) five-point compaction tests shall be performed on representative samples of the material to be used as fill. During fill placement a minimum of one additional moisture-density test shall be performed for every 500 cubic yards placed. Additional tests will be required each time a new material is encountered. The moisture-density curves will be compiled to form a family of curves which will be utilized to estimate optimum properties (maximum dry density and optimum moisture content) to be used with field density test.

3.15.7 Tolerance Tests for Subgrades

Perform continuous checks on the degree of finish specified in paragraphs "Subgrade Preparation" and “Earthen Dam” during construction of the subgrades.

3.15.8 Additional Testing

The Owner or appointed representative may request additional tests if there is reason to doubt the adequacy of the compaction or special compaction procedures are being used. Additional testing may also be required if materials change, if the Owner or appointed representative determines that the Contractor's testing is inadequate, or the Contractor is concentrating backfill and fill operations in a relatively small area.

END OF SECTION

SECTION 31 05 16

AGGREGATES FOR EARTHWORK (10-10-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all aggregate placements to be performed under this Contract for erosion and sediment control measures, for construction related activities, for post-construction stormwater facilities and for temporary construction facilities.

1.2 REFERENCES

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO T 99	(2010) Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop
AASHTO T 224	(2010) Correction for Coarse Particles in the Soil Compaction Test

ASTM INTERNATIONAL (ASTM)

ASTM C 127	(2007) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C 128	(2007a) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
ASTM C 131	(2006) Standard Test Method for Resistance to Degradation of Small-Size Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	(2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 142/C 142M	(2010) Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D 4318	(2010) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4791	(2010) Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D 5821	(2001; R 2006) Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate

ASTM D 698	(2012) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D 6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D 75/D 75M	(2009) Standard Practice for Sampling Aggregates
ASTM E 11	(2009e1) Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT)

PENNDOT Bulletin 14	(2011) Aggregate Producers

U.S. ARMY CORPS OF ENGINEERS (USACE)

CRD-C 120	(1994) Test Method for Flat and Elongated Particles in Fine Aggregate

1.3 SUBMITTALS

A. Within 24 hours of the completion of the physical geotechnical testing, submit four copies of test results, including calibration curves and results of calibration tests.

B. Submit certified copies of field density tests for approval.

C. Submit certificates of compliance for all aggregate materials stating the materials are in compliance with all the specified requirements of these Contract Specifications.

1.4 SOURCES

Aggregate shall be supplied from one source and shall be furnished from an approved aggregate producer listed in PENNDOT Bulletin 14, unless otherwise directed or approved by the Owner or appointed representative. Select the source of the material 30 days prior to the time the material will be required in the work. Tentative approval of material will be based on initial test results for fineness modulus determination, wear tests, flat and elongated particle tests, sieve analysis, percent of crushed particle tests, specific gravity and absorption tests, and clay lumps and friable particle tests. Final approval of the materials will be based on tests performed on samples taken from the completed and fully compacted aggregate placements.

PART 2 – PRODUCTS

2.1 AGGREGATES FOR EARTHWORK

Provide aggregates consisting of clean, sound, durable particles of natural gravel, crushed gravel, crushed stone, sand, or other approved materials processed and blended or naturally combined. Provide aggregates free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign materials. The Contractor is responsible for obtaining materials that meet the quality and gradation requirements after mixing, placing, compacting, and other operations. Sieves shall conform to ASTM E 11.

2.1.1 Coarse Aggregates

Coarse aggregate shall be the material retained on the No. 4 sieve. Provide coarse aggregate with angular particles of uniform density and quality. Crushed gravel shall be manufactured by crushing gravels, while crushed stone shall consist of freshly mined quarry rock, and both crushed gravel and crushed stone shall meet all the requirements specified below.

A. Wear: The coarse aggregate shall not show more than 50 percent loss after 500 revolutions when subjected to the Los Angeles abrasion test in accordance with ASTM C 131.

B. Flat and Elongated Particles: The amount of flat and elongated particles shall not exceed 15 percent in accordance with ASTM D 4791. A flat particle is one having a ratio of width to thickness greater than three; an elongated particle is one having a ratio of length to width greater than three.

C. Sieve Analysis: Coarse aggregate shall be manufactured from particles of the gradations specified herein in accordance with ASTM C 136.

D. Percent of Crushed Particles: In the portion retained on each sieve specified, the crushed aggregates shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces with the area of each face being at least equal to 75 percent of the smallest mid-sectional area of the piece in accordance with ASTM D 5821. When two fractures are contiguous, the angle between planes of the fractures must be at least 30 degrees in order to count as two fractured faces.

E. Specific Gravity and Absorption: The coarse aggregate shall have a minimum bulk specific gravity, saturated surface dry (ssd), of 2.50 based upon water having a unit weight of 62.4 pounds per cubic foot and absorption of less than 3.0 percent in accordance with ASTM C 127.

F. Clay Lumps and Friable Particles: The coarse aggregate shall not contain more than 0.3 percent of clay lumps and friable particles in accordance with ASTM C 142/C 142M.

2.1.2 Fine Aggregates

Fine aggregate shall be the material passing the No. 4 sieve. Fine aggregates shall be angular particles of uniform density. Fine aggregate shall consist of screenings, angular sand, crushed recycled concrete fines, or other finely divided mineral matter processed or naturally combined with the coarse aggregate.

A. Fineness Modulus: The fineness modulus of fine aggregate shall be between 2.30 and 3.15.

B. Flat and Elongated Particles: The amount of flat and elongated particles shall not exceed 10 percent in accordance with CRD-C 120. A flat particle is one having a ratio of width to thickness greater than three; an elongated particle is one having a ratio of length to width greater than three.

C. Sieve Analysis: Fine aggregate shall be manufactured from particles of the gradations specified herein in accordance with ASTM C 136.

D. Specific Gravity and Absorption: The fine aggregate shall have a minimum bulk specific gravity, saturated surface dry (ssd), of 2.50 based upon water having a unit weight of 62.4 pounds per cubic foot and absorption of less than 2.5 percent in accordance with ASTM C 128.

2.1.3 Gradation Requirements

A. Aggregate for rock construction entrances shall consist of AASHTO No. 1 aggregate with the following gradation:

AASHTO NO. 1 AGGREGATE	
SIEVE SIZE	PERCENT PASSING (SQUARE OPENINGS)
4 Inches	100
3-1/2 Inches	90 – 100
2-1/2 Inches	25 – 60
1-1/2 Inches	0 – 15
3/4 Inch	0 – 5

B. Aggregate for the staging/laydown areas ~~and subsurface infiltration bed~~ shall consist of AASHTO No. 3 aggregate with the following gradation:

AASHTO NO. 3 AGGREGATE	
SIEVE SIZE	PERCENT PASSING (SQUARE OPENINGS)
2-1/2 Inches	100
2 Inches	90 – 100
1-1/2 Inches	35 – 70
1 Inch	0 – 15
1/2 Inch	0 – 5

C. Aggregate for bedding associated with concrete structures and pipe shall consist of AASHTO No. 57 aggregate with the following gradation:

AASHTO NO. 57 AGGREGATE	
SIEVE SIZE	PERCENT PASSING (SQUARE OPENINGS)
1-1/2 Inches	100
1 Inch	95 – 100
1/2 Inch	25 – 60
No. 4	0 – 10
No. 8	0 – 5

D. Aggregate for the dual graded filter beneath the emergency spillway control section shall consist of AASHTO No. 8 aggregate with the following gradation:

AASHTO NO. 8 AGGREGATE	
SIEVE SIZE	PERCENT PASSING (SQUARE OPENINGS)
1/2 Inch	100
3/8 Inch	85 – 100
No. 4	10 – 30
No. 8	0 – 10
No. 16	0 – 5

E. Fine aggregate for the filter drainage diaphragm on the principal spillway pipe and for the dual graded filter beneath the emergency spillway control section shall consist of Type A sand with the following gradation:

TYPE A SAND	
SIEVE SIZE	PERCENT PASSING (SQUARE OPENINGS)
3/8 Inch	100
No. 4	95-100
No. 16	45-80
No. 30	30-65
No. 50	10 – 30
No. 100	2 – 10

PART 3 – EXECUTION

3.1 STOCKPILING MATERIALS

Prior to stockpiling the aggregates, clear and level the storage sites. All materials, including approved material available from excavation and grading, shall be stockpiled in the manner and at the locations approved by the Owner or appointed representative. Stockpile aggregates in such a manner that will prevent segregation. Aggregates of differing gradations shall be stockpiled separately.

3.2 AGGREGATE MIXING

Mix the coarse and fine aggregates in a stationary or traveling plant. Make adjustments in mixing procedures or in equipment, as directed, to obtain true grades, to minimize segregation or degradation, to obtain the required water content, and to insure a satisfactory aggregate placement meeting all requirements of this Specification.

3.3 EARTHWORK

All earthwork required prior to placement of aggregate material, including excavation, grading, and surface preparation, shall be performed in accordance with Section 31 00 00 EARTHWORK.

3.4 GEOTEXTILE

Areas to receive geotextile beneath or adjacent to aggregates shall be placed in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK. Carefully place aggregates on geotextiles to produce an even distribution with a minimum of voids and without tearing the geotextile. Place aggregates in a manner to prevent segregation and to avoid displacement of the underlying material. Do not place aggregate in methods likely to cause segregation or geotextile damage.

3.5 AGGREGATE PLACEMENTS

Unless otherwise specified, place aggregates in lifts not exceeding 8 inches in loose thickness. Compact each layer of the aggregate with approved compaction equipment. The moisture content during the compaction procedure shall be maintained as specified. In locations not accessible to the rollers, the mixture shall be compacted with mechanical tampers. Remove any materials that are found to be unsatisfactory and replace them with satisfactory material or rework them to produce a satisfactory material.

3.5.1 Rock Construction Entrances

Place material for rock construction entrances to the minimum length, width, and thickness shown on the Drawings. Maintain rock construction entrances in accordance with Section 01 57 23 STORM WATER POLLUTION CONTROL.

3.5.2 Staging/Laydown Areas

All staging/laydown areas shall be confined to the work areas shown on the Drawings, unless otherwise approved. Offsite staging/laydown areas shall be procured by the Contractor and approved by the Owner or appointed representative. Costs associated with offsite staging/laydown areas shall be borne by the Contractor at no additional expense to the Owner. The Contractor shall arrange for any transportation of employees from the offsite staging/laydown areas. Other onsite staging/laydown areas may be approved by the Owner or appointed representative. Restore areas where staging/laydown areas are installed to preconstruction conditions to the satisfaction of the Owner or appointed representative.

3.5.3 Coarse Aggregate

Place coarse aggregate as pipe bedding, haunching, and initial backfill material and as base for concrete structures as shown on the Drawings and as specified in Section 33 40 00 STORM DRAINAGE UTILITIES.

3.5.4 Coarse Base Aggregate

Place coarse base aggregate on the underlying subgrade in lifts of uniform thickness using approved equipment. Placement of coarse base aggregate shall not exceed 8 inches loose thickness. When a compacted layer 6 inches or less in thickness is required, place the material in a single lift. When a compacted layer in excess of 6 inches is required, place the material in lifts of equal thickness. No lift shall exceed 6 inches nor be less than 3 inches when compacted. The lifts when compacted after placement shall be true to the grades or levels required with the least possible surface disturbance. When the coarse base aggregate is placed in more than one lift, clean the previously constructed lift of loose and foreign material. Such adjustments in placing procedures or equipment shall be made to obtain true grades and minimize segregation and degradation of the coarse base aggregate. Spread coarse base aggregate by hand in areas where machine spreading is impractical. The material shall be spread uniformly in a loose layer to prevent segregation. The material shall conform to the required grade and thickness after compaction.

3.5.5 Temporary Contractor Access Roads

Construct temporary Contractor access roads necessary for proper prosecution of the work under this Contract as shown on the Drawings and specified herein. Construct with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. Location, grade, width, and alignment of temporary Contractor access roads are subject to approval by the Owner or appointed representative. Maintain relative smoothness and thickness in temporary Contractor access roads by removing material, replacing with new material, or reworking existing material and compacting, as directed. Restore areas where temporary Contractor access roads are installed to preconstruction conditions to the satisfaction of the Owner or appointed representative.

3.5.8 Dual Graded Filter Installation

Place select aggregate and fine aggregate sand for the dual graded filter on the underlying subgrade in lifts of uniform thickness using approved equipment. Placement of coarse base aggregate shall be placed in a single lift to achieve the 9-inch compacted thickness as shown on the Drawings and to minimize segregation. Spread and compact the coarse base aggregate and fine aggregate sand in an upslope direction to maintain thickness. The lifts when compacted after placement shall be true to the grades or levels required with the least possible surface disturbance. Spread coarse base aggregate and fine aggregate sand by hand in areas where machine spreading is impractical. The material shall conform to the required grade and thickness after compaction.

Wet the coarse base aggregate and fine aggregate sand to aid in uniform spreading and thickness if necessary. Compaction of fine aggregate sand shall be achieved during spreading operations. No additional compaction after spreading is required.

The finished surface aggregate thickness shall not deviate from the lines and grades shown by more than the tolerances listed below. Tolerances are measured perpendicular to the indicated neat lines. Extreme limits of the tolerances given shall not be continuous in any direction for an area greater than 200 square feet of the surface.]

DUAL GRADED FILTER NEAT LINE TOLERANCES		
MATERIAL	ABOVE NEAT LINE	BELOW NEAT LINE
Fine Aggregate sand	0.1 feet	0.05 feet
Select Aggregate	0.1 feet	0.05 feet

3.6 COMPACTION

3.6.1 Rock Construction Entrances

Compact the rock construction entrances, if necessary, to maintain geometry for the anticipated traffic loading.

3.6.2 Staging/Laydown Areas

Compact the staging/laydown area aggregate mixture to non-movement within 5 percent of optimum moisture content as specified herein.

3.6.3 Dual Graded Filter

Compact the dual graded filter to non-movement within 3 percent of optimum moisture content as specified herein.

3.6.4 Coarse Aggregate

Compaction of coarse aggregate for pipe and concrete structures shall be as specified in Section 33 40 00 STORM DRAINAGE UTILITIES.

3.6.5 Temporary Contractor Access Roads

Compact all layers of the temporary gravel roadway until each layer through the full depth is compacted until non-movement is observed within 3 percent of optimum moisture. Layer thickness shall not exceed 6 inches nor be less than 3 inches in compacted thickness.

3.7 TESTING

Aggregate samples for laboratory testing shall be taken in conformance with ASTM D 75/D 75M. Perform one of each of the following tests on the proposed material prior to furnishing material onsite to demonstrate that the proposed material meets all specified requirements when furnished.

A. Wear.
B. Flat and Elongated Particles.
C. Sieve Analysis.
D. Percent of Crushed Particles.
E. Specific Gravity and Absorption.
F. Clay Lumps and Friable Particles.
G. Fineness Modulus.
H. Atterberg Limits.
I. Moisture-Density Relationship.

3.7.1 Moisture-Density Determinations

Determine the laboratory maximum dry density and optimum moisture content in accordance with ASTM D 698 for materials that have 30 percent or less by weight of their particles retained on the 3/4 inch sieve, and AASHTO T 99 and corrected with AASHTO T 224 for materials having more than 30 percent by weight of their particles retained on the 3/4 inch sieve. Perform tests for each type of material to determine the optimum moisture and laboratory maximum density values. One representative test per 1,000 cubic yards of aggregate during placement, or when any change in material occurs, which may affect the optimum moisture content or laboratory maximum density.

3.7.2 Field Density Tests

A. Field density shall be measured in accordance with ASTM D 6938. For the method presented in ASTM D 6938 check the calibration curves and adjust them, if necessary, using only the sand cone method as described in paragraph "Calibration" of the ASTM publication. Tests performed in accordance with ASTM D 6938 result in a wet unit weight of soil, and ASTM D 6938 shall be used to determine the moisture content of the material. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM

D 6938. The calibration checks of both the density and moisture gauges shall be made by the prepared containers of material method, as described in paragraph "Calibration" of ASTM D 6938, on each different type of material being tested at the beginning of a job and at intervals as directed.

B. Two in-place density tests shall be performed on every 500 cubic yards of aggregate placed to monitor the degree of compaction in accordance with ASTM D 6938. At least one in-place density test shall be performed at each pipe installation location.

C. One check test for in-place densities shall be performed on every 1,000 cubic yards, or fraction thereof, of aggregate placed.

END OF SECTION

SECTION 31 05 19

GEOSYNTHETICS FOR EARTHWORK (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for furnishing, hauling, and placing the geotextile, complete, as specified and as shown on the Drawings, and maintaining the geotextile until placement of the cover material is completed and accepted.

1.2 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM D 123	(2009e2) Standard Terminology Relating to Textiles
ASTM D 4354	(1999; R 2009) Standard Practice for Sampling of Geosynthetics for Testing
ASTM D 4355	(2007) Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus
ASTM D 4491	(1999a; R 2009) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(2011) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(2008) Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(2004) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D 4873	(2002; R 2009) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D 4884	(2009) Standard Test Method for Strength of Sewn or Thermally Bonded Seams of Geotextiles
ASTM D 6241	(2004; R 2009) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

1.3 SUBMITTALS

A. Submit geotextile samples for testing, if requested by the Owner or appointed representative, to determine compliance with the requirements in this Section, a minimum of 30 days prior to the beginning of installation of the same geotextile.

B. Upon request, supply quality control and quality assurance tests for the geotextile. Provide all samples from the same production lot as will be supplied for the Contract, of the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Samples submitted for testing shall be identified by manufacturer's lot designation.

C. Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll values listed in Tables herein. For needle punched geotextile, the manufacturer shall certify that the geotextile has been inspected using permanent online metal detectors and does not contain any needles.

D. Submit duplicate copies of the mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile. The mill certificate or affidavit shall attest that the geotextile meets the chemical, physical, and manufacturing requirements stated in this Specification. All brands of geotextile and all seams to be used will be accepted on the basis of mill certificates or affidavits.

E. Submit site verification and testing results from the lot under review for approval prior to deployment of that lot of geotextile.

F. Submit product data of geotextile adhesive as recommended by the geotextile manufacturer for approval.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver only approved geotextile rolls to the project site. All geotextile shall be labeled, shipped, stored, and handled in accordance with ASTM D 4873. No hooks, tongs, or other sharp instruments shall be used for handling geotextile.

B. Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.

C. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from site construction damage, precipitation, extended ultraviolet radiation including sunlight, chemicals that are strong acids or bases, flames, excessive temperatures, and any other environmental conditions that may damage the physical property values of the geotextile.

PART 2 – PRODUCTS

2.1 GEOTEXTILE MATERIALS

Provide geotextile that is a woven or nonwoven pervious sheet of plastic yarn as defined by ASTM D 123 matching or exceeding the minimum average roll values (MARV) listed below and for the intended purpose shown on the Drawings. Strength values indicated in the table are for the weakest principal direction.

2.1.1 Woven Geotextile Parameters

The MARV listed in Table 1A reflect the characteristics of Mirafi 500X woven geotextile as manufactured by TenCate Geosynthetics, 365 South Holland Drive, Pendergrass, GA 30567; Phone: 1-800-685-9990; Fax: 1-706-693-4400; Internet: www.tencate.com, for use in all locations except those noted in Table 2. The Contractor may substitute a woven geotextile for approval that meets or exceeds all of the parameters listed in Table 1.

TABLE 1A MINIMUM PHYSICAL REQUIREMENTS FOR WOVEN GEOTEXTILE			
PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
Grab Tensile Strength	LBS	200	ASTM D 4632
Grab Tensile Elongation	Percent	15	ASTM D 4632
Trapezoidal Tear Strength	LBS	75	ASTM D 4533
CBR Puncture Strength	LBS	700	ASTM D 6241
Permittivity	SEC^{-1}	0.05	ASTM D 4491
Apparent Opening Size	U.S. Sieve	40	ASTM D 4751
Ultraviolet Degradation	Percent Retained	70 at 500 Hrs.	ASTM D 4355

2.1.2 Nonwoven Geotextile Parameters

The MARV listed in Table 2 reflect the characteristics of Mirafi 140N nonwoven geotextile as manufactured by TenCate Geosynthetics, 365 South Holland Drive, Pendergrass, GA 30567; Phone: 1-800-685-9990; Internet: www.tencate.com. The Contractor may substitute a nonwoven geotextile for approval that meets or exceeds all of the parameters listed in Table 2.

TABLE 2 MINIMUM PHYSICAL REQUIREMENTS FOR NONWOVEN GEOTEXTILE			
PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
Grab Tensile Strength	LBS	120	ASTM D 4632
Elongation	Percent	50	ASTM D 4632
Trapezoidal Tear Strength	LBS	50	ASTM D 4533
CBR Puncture Strength	LBS	310	ASTM D 6241
Permittivity	SEC^{-1}	1.7	ASTM D 4491
Apparent Opening Size	U.S. Sieve	70	ASTM D 4751
Flow Rate	GPM/SF	135	ASTM D 4491
Ultraviolet Degradation	Percent Retained	70 at 500 Hrs.	ASTM D 4355

2.1.3 Geotextile Fiber

Fibers used in the manufacturing of the geotextile shall consist of a long-chain synthetic polymer composed of at least 95 percent by weight of polyolefins, polyesters, or polyamides. Add stabilizers and/or inhibitors to the base polymer, if necessary, to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Reclaimed or recycled fibers or polymers shall not be added to the formulation. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the selvages. Finish the edges of the geotextile to prevent the outer fiber from pulling away from the geotextile.

2.1.4 Seams

High strength thread should be used so that seam tests conform to ASTM D 4884. The thread shall meet the chemical, ultraviolet, and physical requirements of the geotextile, and the color shall be different from that of the geotextile. The strength of the seam shall be not less than 90 percent of the required grab tensile strength of the unaged geotextile in any principal direction.

2.1.5 Securing Pins

Secure the geotextile to the foundation soil by pins to prevent movement prior to placement of overlying materials. Other appropriate means to prevent movement such as staples, sand bags, and stone could also be used. Insert securing pins through both strips of overlapped geotextile along the line passing through the midpoints of the overlap. Remove securing pins as materials are placed to prevent tearing of geotextile or enlarging holes. Maximum spacing between securing pins depends on the steepness of the embankment slope. The maximum pin spacing shall be equal to or less than the values listed in Table 3. When windy conditions prevail at the project site, increase the number of pins upon the demand of the Owner or appointed representative. Anchor terminal ends of the geotextile with key trench or apron at crest, toe of the slope, and upstream and downstream limits of installation.

TABLE 3 MAXIMUM SPACING FOR SECURING PINS	
FOUNDATION SLOPE	SPACING (FEET)
Steeper Than 3H:1V	2
3H:1V to 4H:1V	3
Flatter Than 4H:1V	5

2.2 ADHESIVE

Adhesive for bonding geotextile to concrete surfaces at expansion joints as shown on the Drawings shall be a product recommended by the geotextile manufacturer and approved by the Owner or appointed representative, and shall not cause damage or degradation of the geotextile material during application and drying periods of the adhesive.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

Prepare the surface on which the geotextile will be placed to a relatively smooth surface condition in accordance with the applicable portion of this Specification. Surface shall be free from obstruction, debris, depressions, erosion features, or vegetation. Remove any irregularities so as to ensure continuous, intimate contact of the geotextile with the entire surface. Any loose material, or soft or low density pockets of material shall be removed; erosion features such as rills, gullies, etc., shall be graded out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

Place the geotextile in the manner and at the locations shown. At the time of installation, the Owner or appointed representative reserves the right to reject a portion or all of the geotextile if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

3.2.2 Placement

Place the geotextile with the long dimension parallel to the flow or travel direction and laid smooth free of tension, stress, folds, wrinkles, or creases. Place the strips to provide a minimum width of 12 inches of overlap for each joint in trenches, and a minimum of 18 inches of overlap elsewhere. The placement procedure requires that the length of the geotextile be approximately 25 percent greater than the slope length. Adjust the actual length of the geotextile used based on initial installation experience. Temporary pinning of the geotextile to help hold it in place until the overlying material is placed will be allowed. Remove the temporary pins as the overlying material is placed to relieve high tensile stress which may occur during placement of material on the geotextile. Perform trimming in such a manner that the geotextile is not damaged in any way.

3.3 ADHESIVE APPLICATION

All surfaces to receive adhesive shall be prepared in accordance with the adhesive manufacturer's written recommendations. Adhesive shall be applied at the rates and procedures recommended by the adhesive manufacturer. Backfill shall not be placed against the adhered geotextile until the installation has been accepted by the Owner or appointed representative.

3.4 PROTECTION

Protect the geotextile at all times during construction from contamination by surface runoff; remove any geotextile so contaminated and replace with uncontaminated geotextile. Replace any geotextile damaged during its installation or during placement of overlying material at no cost to the Owner. Protect the geotextile from damage prior to and during the placement of overlying materials. This may be accomplished by limiting the height of drop to less than one foot, or other methods deemed necessary. Care should be taken to ensure that the utilized methods will not impede the flow of water. Before placement of overlying materials, demonstrate that the placement technique will not cause damage to the geotextile. In no case shall any type of equipment be allowed on the unprotected geotextile.

3.5 OVERLAPPING AND SEAMING

3.5.1 Overlapping

The overlap of geotextile rolls shall be 12 inches minimum in trenches, and a minimum of 18 inches elsewhere. Appropriate measures will be taken to ensure required overlap exists after overlying material placement.

3.5.2 Sewn Seams

Overlapping J-type seams are preferable over prayer-type seams as the overlapping geotextile reduces the chance of openings to occur at the seam. Use double sewing, especially for field seams, to provide a safety factor against undetected missed stitches.

3.6 INSPECTIONS, VERIFICATIONS, AND TESTING

3.6.1 Manufacturing and Sampling

Geotextiles and factory seams shall meet the requirements specified herein. Random sampling of geotextiles shall be performed in accordance with ASTM D 4354, Procedure Method A. Sample factory seams at the frequency specified in ASTM D 4884.

3.6.2 Site Verification and Testing

At the request of the Owner or appointed representative, collect samples at approved locations upon delivery to the site in accordance with ASTM D 4354, Procedure Method B. Test samples to verify that the geotextile meets the requirements specified herein. Identify samples by manufacturer's name, type of geotextile, lot number, roll number, and machine direction. Perform testing at an approved laboratory. Rolls which are sampled shall be immediately rewrapped in their protective covering.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all clearing and grubbing to be performed under this Contract. Site clearing and grubbing operations shall not commence until temporary erosion and sediment pollution controls are in place.

1.2 SUBMITTALS

A. Submit product data of tree wound paint for approval prior to delivery onsite.

PART 2 – PRODUCTS

2.1 TREE WOUND PAINT

Tree wound paint shall be a bituminous based paint of standard manufacture specially formulated for tree wounds.

PART 3 – EXECUTION

3.1 PROTECTION

3.1.1 Roads

Keep roads free of dirt and debris at all times. Minimize interference with adjoining roads or other adjacent occupied facilities. Do not close or obstruct roads or other occupied facilities without written approval from the Owner, appointed representative, or authorities having jurisdiction.

3.1.2 Trees, Shrubs, and Existing Facilities

Trees and vegetation to be left standing shall be protected from damage incidental to clearing, grubbing, and construction operations by the erection of barriers, the placement of flagging or pin flags, or by such other means as the circumstances require. Existing site features damaged during construction by the Contractor's operations shall be replaced in kind to preconstruction conditions to the satisfaction of the Owner or appointed representative.

3.1.3 Utility Lines

Protect existing utility lines that are to remain from damage. Notify the Owner or appointed representative immediately of damage to, or an encounter with, an unknown existing utility line. The Contractor is responsible for the repairs of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations or identified through the Pennsylvania One Call System.

3.2 CLEARING

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be directed to be left standing. Tree trunks may be cut off above ground should they be used to secure devices needed for the removal/extraction of the tree stump. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 1-1/2 inches or more in diameter and shall be trimmed of all branches to the heights directed. Limbs and branches to be trimmed shall be neatly cut close to the bole of the tree or main branches. Cuts more than 1-1/2 inches in diameter shall be painted with approved tree wound paint.

3.3 GRUBBING

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas. Material to be grubbed shall be removed to a depth of not less than 18 inches below the original surface level of the ground. Depressions made by grubbing shall be filled with suitable material approved by the Owner or appointed representative and compacted to make the surface conform to the original adjacent surface of the ground. Tree trunks used to assist in the removal of the tree stump shall be cut following successful removal of the tree stump.

3.4 DISPOSAL OF MATERIALS

Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations shall become the property of the Contractor and shall be disposed of offsite at a properly permitted disposal facility, except when otherwise approved in writing. Written permission to dispose of such materials on private property shall be filed with the Owner or appointed representative prior to removal of the material from the project site. Such directive will state the conditions covering the disposal of such materials and will also state the areas in which they may be placed. Accidental loss or damage to private property shall be the Contractor's responsibility at no expense to the Owner. Burning or other methods of disposal of such materials shall not be permitted at the project site.

END OF SECTION

SECTION 31 23 23.33

FLOWABLE FILL (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for flowable fill to be placed as specified herein and as shown on the Drawings.

1.2 REFERENCES

ACI INTERNATIONAL (ACI)

ACI 211.1	(1991; R 2009) Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 229R	(1999) Controlled Low-Strength Materials

ASTM INTERNATIONAL (ASTM)

ASTM C 1077	(2011b) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 150/C 150M	(2011) Standard Specification for Portland Cement
ASTM C 260/C 260M	(2010a) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 33/C 33M	(2011a) Standard Specification for Concrete Aggregates
ASTM C 494/C 494M	(2011) Standard Specification for Chemical Admixtures for Concrete
ASTM C 618	(2008a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C 94/C 94M	(2011b) Standard Specification for Ready-Mixed Concrete
ASTM C 940	(2010a) Standard Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory
ASTM D 4832	(2010) Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders

ASTM D 6023	(2007) Standard Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM)
ASTM D 6103	(2004) Standard Test Method for Flow Consistency of Controlled Low-Strength Material (CLSM)

1.3 DESIGN REQUIREMENTS

1.3.1 General

Furnish and place flowable fill in locations shown on the Drawings including, but not limited to, around the drawdown chamber pipe, in locations where fill materials cannot be properly placed and compacted due to space restrictions, or as directed by the Owner or their appointed representative.

1.3.2 Flowable Fill Performance

A. Flowable fill shall have a compressive strength between 100 to 300 pounds per square inch at 28 days.

B. Flowable fill shall attain strength such that it can support the weight of a person no more than 24 hours after placement.

C. Flowable fill shall have a flow of 8 inches plus or minus 2 inches.

D. Flowable fill shall have minimal subsidence and bleed water shrinkage. Flowable fill shall be essentially free from shrinkage after hardening. Evaporation of bleed water shall not result in shrinkage of more than 1/8 inch per foot of depth for mixes containing high fly ash content.

E. Flowable fill shall have a unit weight of 115 to 145 pounds per cubic foot, measured at the point of placement.

1.3.3 Flowable Fill Mix Design

A. A mix design shall be submitted for each flowable fill mix to be used on the project. Each mix design shall list the proportions by weight of cementitious materials, weight or volume of water, weights of aggregates in a saturated surface-dry condition, and type, quantity, and name of admixtures per cubic yard of flowable fill. All materials included in the mixture shall be of the same type and from the same source as will be used on the project. Each mix shall be accompanied by evidence by one of the following methods that demonstrates the mix will produce flowable fill having the characteristics and quality as specified:

   1. <u>Project Data</u>: Submit evidence obtained within the last 5 years from previous quality control testing on the flowable fill mix.

   2. <u>Mix Design Study</u>: Submit a mix design study complying with ACI 211.1 conducted in the past 12 months. The mix design shall be completed by a testing laboratory complying with ASTM C 1077.

B. Project data or mix design studies shall be obtained for the exact mix as submitted. Minor mix alterations or substitutions may be accepted if approved by the Owner or their appointed representative. Any alterations or substitutions shall be clearly identified, and shall be accompanied by recommendations from the admixture supplier or a registered professional engineer licensed within the Commonwealth of Pennsylvania indicating the expected effects on the flowable fill.

1.4 SUBMITTALS

A. Submit flowable fill mix design data as determined by the Contractor, including evidence that the mix will produce the characteristics and quality specified herein, for approval prior to batching. Provide mix proportions for flowable fill mix designs containing cement and water. At the Contractor's option, it may also contain fly ash, aggregate, or chemical admixtures in any proportions such that the final product meets the strength, flow consistency, and shrinkage requirements included in this Specification Section. Mix design shall include test results for compressive strength, density, yield, air content, flow, and final bleeding.

B. Submit certificates of compliance for all cementitious materials and chemical admixtures stating the materials and admixtures are in compliance with all the specified requirements of these Contract Specifications. Cement and fly ash shall be accompanied by mill test reports. Certification and mill test reports shall be from the particular lot furnished.

C. Submit data on the conveying equipment and methods for transporting, handling, and depositing the flowable fill.

D. Submit aggregate quality tests at least 30 days prior to start of flowable fill placement.

E. Submit flowable fill performance test results, including compressive strength at 28 days and flow.

1.5 QUALITY ASSURANCE

1.5.1 Manufacturer

Flowable fill shall be manufactured by a ready-mix concrete producer with a minimum of one year experience in the production of similar products.

1.5.2 Materials

For each type of material required for the work, provide primary materials that are the products of one manufacturer.

1.5.3 Flowable Fill Requirements

Comply with ACI 229R, except as specified herein.

1.5.4 Testing for Mix Design

Submit test results with the mix design as follows:

A. Test compressive strength in accordance with ASTM D 4832.

B. Measure density, yield, and air content in accordance with ASTM D 6023.

C. Measure flow in accordance with ASTM D 6103.

D. Measure final bleeding in accordance with Section 10 of ASTM C 940.

1.5.5 Testing for Contractor Quality Control

Submit results of Contractor quality control testing within 7 days of performing tests:

A. Test compressive strength in accordance with ASTM D 4832.

B. Measure flow in accordance with ASTM D 6103.

PART 2 – PRODUCTS

2.1 CEMENTITIOUS MATERIALS

Cementitious materials shall be portland cement, or portland cement in combination with fly ash.

2.1.1 Portland Cement

Portland cement shall conform to ASTM C 150/C 150M, Type II.

2.1.2 Pozzolan (Fly Ash)

Fly ash shall conform to ASTM C 618, Class F, including low alkali multiple factor, drying shrinkage, and uniformity requirements of Table 3 of ASTM C 618.

2.2 AGGREGATES

2.2.1 Fine Aggregate

Fine aggregate shall consist of natural sand, manufactured sand, or a combination of natural sand and manufactured sand, and shall conform to the quality and gradation requirements of ASTM C 33/C 33M.

2.2.2 Coarse Aggregate

Coarse aggregate, when required or permitted, shall conform to ASTM C 33/C 33M, Class 4S. Size designation shall be indicated in the mix design.

2.3 CHEMICAL ADMIXTURES

Chemical admixtures, when required or permitted, shall conform to the appropriate specification listed and shall be formulated by the manufacturer for use in flowable fill. Admixtures shall be furnished in liquid form and of suitable concentration for easy, accurate control of dispensing.

2.3.1 Air-Entraining Admixture

The air-entraining admixture shall conform to ASTM C 260/C 260M and shall consistently entrain the air content in the mix design range under field conditions.

2.3.2 Accelerating Admixture

Accelerating admixture shall meet the requirements of ASTM C 494/C 494M, Type C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

2.4 WATER

Water for mixing and curing shall be fresh, clean, potable, and free of injurious amounts of oil, acid, salt, or alkali, except that non-potable water may be used if it meets the requirements of ASTM C 94/C 94M.

PART 3 – EXECUTION

3.1 FLOWABLE FILL PRODUCTION AND CONVEYANCE

A. Flowable fill shall be batched, mixed, and transported in accordance with ACI 229R.

B. Flowable fill shall be mixed only in quantities for immediate use. Flowable fill that has set shall be discarded and shall not be retempered.

C. Discharge flowable fill from trucks within 90 minutes after cement and fly ash is added to the mix.

D. Flowable fill shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients.

3.2 FLOWABLE FILL PLACEMENT

A. Flowable fill shall be placed to the lines, grades, and locations as shown on the Drawings, or as directed by the Owner or their appointed representative.

B. Materials shall be proportioned in accordance with the approved mix design. The product shall be of consistent texture and flow characteristics. The Owner or their appointed representative may reject any materials exhibiting a substantial change in properties, appearance, or composition.

C. Flowable fill which has partially hardened or has been contaminated by hardened material shall not be deposited.

D. Deposit flowable fill as soon as practicable so it can flow to any irregular area and fill completely.

E. Protect the material placed from freezing for 72 hours after placement.

F. Allow flowable fill to self-level.

3.3 CLEANING

Upon completion of placing flowable fill, clean the surrounding area of all flowable fill spatters, or other foreign material detrimental to appearance or function. Do not contaminate placed flowable fill with wash water or debris.

END OF SECTION

SECTION 32 92 19

SEEDING (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for all temporary and permanent seeding and topsoil placement to be performed under this Contract.

1.2 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM C 25	(2011) Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime
ASTM D 4972	(2001; R 2007) pH of Soils

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act
DOA SSIR 42	(1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.3 DEFINITIONS

1.3.1 Certified Seed

Certified seed is seed of known genetic identity that has been field and laboratory inspected and tested during its period of growth to provide a source of high quality seed and ensure genetic identity and purity. Seeds are certified by recognized certifying agencies that conform to the certification laws and regulations of Pennsylvania or other states. Certification identification shall be indicated on all seed lot tags or labels.

1.3.2 Germination

Germination is the emergence and development of a seed embryo of essential plant structures that can produce a normal plant under favorable conditions. Germination is represented by a percentage of an identified seed quantity, exclusive of hardseed.

1.3.3 Hardseed

Hardseed is unscarified seed that remains hard or has not germinated at the end of a prescribed test period because the seed has not absorbed water due to an impermeable seed coat.

1.3.4 Pure Live Seed (PLS)

PLS defines the planting quality of seed, exclusive of inert matter and all other seeds not of the seed type being analyzed, as determined by inspection and testing regulations. PLS is often used where seed industry standards have not been established for minimum acceptable purity and germination limits.

1.3.5 Purity

Purity is the genetic identity of a seed that will produce a known plant. Purity is represented by a percentage of an identified seed quantity or seed lot.

1.3.6 Seed Formula

Seed formula is a seed mixture of more than one variety of a seed kind in excess of 5 percent by weight of the whole.

1.3.7 Seed Lot

Seed lot is a definite quantity of seed identified by an assigned number or mark and is uniform throughout for all seed quality factors stated on the lot label or are within permitted tolerances.

1.3.8 Seed Mixture

Seed mixture is a seed batch that consists of more than one kind of seed when each kind is present in excess of 5 percent of the whole.

1.3.9 Variety

Variety is a plant kind subdivision that can be differentiated from other plants of the same kind by growth, yield, fruit, color, seed, or other identifying characteristics.

1.3.10 Weed Seed

Weed seed is a seed producing plant generally recognized as a weed by the Pennsylvania Department of Agriculture and includes the seed of prohibited and restricted noxious weeds.

1.3.11 Herbicide

Herbicide is an agent used to destroy or inhibit plant growth.

1.3.12 Finish Grade

Finish grade is the elevation of the finished planting soil surface.

1.3.13 Onsite Topsoil

Onsite topsoil is defined as existing surface soil capable of producing vegetative growth that may be modified with soil amendments and fertilizers and reused to produce a soil mixture best for plant growth.

1.3.14 Offsite Topsoil

Offsite topsoil is defined as imported topsoil furnished by the Contractor that has been modified with soil amendments and fertilizers to produce a soil mixture best for plant growth.

1.4 SUBMITTALS

A. Submit certified reports of inspections and laboratory tests for soil and topsoil testing, prepared by an independent testing agency, including analysis, interpretation, and recommendations of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

B. Prior to the delivery of materials, submit certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include, but not be limited to, the following:

1. Seed: Classification, State certification, botanical name, common name, percent pure live seed, minimum percent germination and hardseed, maximum percent weed seed content, and date tested and packaged for each seed mixture.

2. Topsoil: Particle size, pH, organic matter content, textural class, soluble salts, and chemical and mechanical analyses.

3. pH Adjuster: Calcium carbonate equivalent and sieve analysis.

4. Fertilizer: Chemical analysis, composition and physical characteristics, and recommendations.

5. Organic Material: Composition and source.

6. Soil Conditioners: Composition and source.

7. Mulch: Composition and source.

8. Asphalt Adhesive: Composition.

9. Inoculant: Composition.

10. Herbicide: Composition, product label, and manufacturer's application instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Seed Protection

Protect seed from drying out, contamination during delivery, onsite storage, and handling.

1.5.1.2 Seed and Soil Supplement Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to State and Federal laws. Instead of containers, soil supplements may be furnished in bulk with certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Seed and Soil Supplement Storage

Materials shall be stored away from contaminants in dry, cool locations.

1.5.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.5.2.3 Inoculant

Inoculant containers shall be stored at moderate temperatures.

1.5.3 Handling

Do not drop or dump materials from vehicles or near structures, utilities, pavements, or on existing turf areas or plants. Provide erosion control measures to prevent erosion or displacement of materials, prevent discharge of soil-bearing water runoff, and prevent airborne dust to reach adjacent properties, water conveyance systems, or pavements.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

Planting shall be performed within the dates specified in paragraph “Planting Dates”. Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit. Apply seed within 24 hours after seed bed preparation. Proceed with seeding operations only when existing and forecasted weather conditions permit seeding to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to the manufacturer’s written recommendations.

PART 2 – PRODUCTS

2.1 SEED

2.1.1 Classification

A. Provide seed conforming to the regulations of Chapter 71 – Seed of the Pennsylvania Seed Act 164 of 2004, effective January 29, 2005, and amendments. Meet other applicable regulations of the Seed, Testing, and Certification Programs of the Pennsylvania Department of Agriculture (PDA), Bureau of Plant Industry. Seed shall be of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weed seed content, and inert material. Label in conformance with AMS Seed Act and applicable

Pennsylvania seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will not be acceptable.

B. Provide seeds that have been tested and approved for the specified seed formula's purity, germination, and weed seed analysis limits and other applicable PDA rules for seed testing.

C. Provide certified seed for all Kentucky Bluegrass, Perennial Ryegrass, Tall Fescue, Creeping Red Fescue, and Chewings Fescue varieties submitted for each seed formula.

D. Premixed seed mixtures shall be from a licensed seed distributor or seed mixing company located within Pennsylvania and mixed under the supervision of the PDA for the specified seed formulas. Use only seed that has an approved seed inspector's tag or label signed by a PDA inspector sewn or stapled to the outside of each seed bag or other container in a conspicuous place. Pressure sensitive labels may be used on paper or plastic containers.

E. Do not use seed from containers that have not been properly sealed. Do not use seed that has a "Sell By" date more than 15 months from the date of the inspection test, exclusive of the test month. The Owner or appointed representative may reject or request retesting for any questionable seed delivered to the project.

2.1.2 Seeding Requirements

Permanent seeding shall be either Formula B (general seeding areas) or Formula D (steep slopes greater than 3 horizontal to 1 vertical). Temporary seeding shall be Formula E. All seed formulas shall be in accordance with the following seeding requirements.

<table>
<tr><th colspan="2" rowspan="2">FORMULA AND SPECIES</th><th rowspan="2">PERCENT BY WEIGHT</th><th colspan="2">MINIMUM PERCENT</th><th rowspan="2">MAXIMUM PERCENT WEED SEED</th><th rowspan="2">SEEDING RATE (LBS/ 1,000 SY)</th></tr>
<tr><th>PURITY</th><th>GERMINATION</th></tr>
<tr><td rowspan="4">B</td><td>Perennial Ryegrass Mixture (Lolium perenne). A combination of improved certified varieties with no one variety exceeding 50% of the total Ryegrass component</td><td>20</td><td>98</td><td>90</td><td>0.15</td><td>5.0</td></tr>
<tr><td>Creeping Red Fescue or Chewings Fescue</td><td>30</td><td>98</td><td>85</td><td>0.15</td><td>6.0</td></tr>
<tr><td>Kentucky Bluegrass Mixture (Poa pratensis). A combination of improved certified varieties with no one variety exceeding 25% of the total Bluegrass component</td><td>50</td><td>98</td><td>80</td><td>0.20</td><td>12.0</td></tr>
<tr><td colspan="5">Total Formula B Seeding Rate (LBS/1,000 SY)</td><td>23.0</td></tr>
<tr><td rowspan="3">D</td><td>Tall Fescue (Festuca arundinacea var. Kentucky 31)</td><td>70</td><td>98</td><td>85</td><td>0.15</td><td>16.0</td></tr>
<tr><td>Creeping Red Fescue or Chewings Fescue</td><td>30</td><td>98</td><td>85</td><td>0.15</td><td>7.0</td></tr>
<tr><td colspan="5">Total Formula D Seeding Rate (LBS/1,000 SY)</td><td>23.0</td></tr>
<tr><td rowspan="2">E</td><td>Annual Ryegrass (Lolium multiflorum)</td><td>100</td><td>98</td><td>90</td><td>0.15</td><td>12.0</td></tr>
<tr><td colspan="5">Total Formula E Seeding Rate (LBS/1,000 SY)</td><td>12.0</td></tr>
</table>

2.1.3 Planting Dates

A. Spread seeds within the following dates, unless otherwise indicated.

FORMULA	PLANTING DATES
Formula B	March 15 to June 1
	August 1 to October 15
Formula D	March 15 to June 1
	August 1 to October 15
Formula E	March 15 to October 15

B. Seeding dates may be extended by the Owner or appointed representative where project conditions warrant. Apply full treatment or apply only 50 percent of the permanent seeding and soil supplements and apply the remaining 50 percent within the next seeding dates, as directed in writing. Use tillage and soil supplements before permanent seeding on topsoiled areas where temporary seeding or mulching has been applied. The Contractor may apply permanent seed and/or soil supplements without tilling topsoiled areas where temporary seeding or mulching has been applied.

2.2 TOPSOIL

2.2.1 Onsite Topsoil

Onsite topsoil is present at the site and varies in thickness as indicated on the Soil Boring Logs shown on the Contract Drawings. The onsite topsoil has not been tested for fertility or suitability for reuse in landscaping applications. If the Contractor chooses to reuse the onsite topsoil, then the material shall be tested by the Contractor for fertility and suitability and meet the requirements specified in paragraph "Composition". The topsoil shall meet all specified requirements to be approved for reuse. Topsoil shall be free from subsoil, noxious weeds, stones larger than 1 inch in diameter, lime, cement, ashes, slag, coal, or other deleterious matter. The topsoil shall also be free of rocks, debris, stumps, roots, or other material considered objectionable by the Owner or their appointed representative. Topsoil shall be well drained in its original position and free from toxic quantities of acid or alkaline elements. Prior to reuse, all existing vegetation shall be removed from the topsoil. Onsite topsoil not meeting any of the requirements of this Specification Section shall become the property of the Contractor, removed from the project site, and disposed of at a properly permitted disposal facility.

2.2.2 Offsite Topsoil

Topsoil for seeding, once all available onsite topsoil supplies have been reused or disposed of, shall be offsite topsoil and shall conform to requirements specified in paragraph "Composition".

2.2.3 Composition

Topsoil shall contain between 5 and 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method, described in DOA SSIR 42. Maximum particle size shall be 1 inch, with maximum 3 percent retained on the 1/4 inch screen. The pH shall be tested in accordance with ASTM D 4972. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits, unless otherwise approved by the Owner or appointed representative:

Silt	25 to 50 percent
Clay	10 to 30 percent
Sand	20 to 35 percent
pH	5.5 to 7.0
Soluble Salts	600 ppm Maximum

2.3 SOIL SUPPLEMENTS

Add conditioners to topsoil as required to bring into compliance with paragraph "Composition" for topsoil as specified herein. The Contractor shall perform nutrient testing on the topsoil to verify the nitrogen, potassium, and phosphorous percentages reflective in the fertilizer as specified herein.

2.3.1 Pulverized Agricultural Limestone

A. Pulverized agricultural limestone shall conform to the requirements of the Agricultural Liming Materials Act of 1978, P.L. 15, No. 9, as amended; The Agricultural Liming Materials Rules and Regulations (Title 7-Part V); 7 PA Code, Chapter 108, for labeling requirements; and as follows:

1. Total oxides (total calcium oxide and magnesium oxide equivalent) shall be 50 percent when tested in accordance with ASTM C 25.

2. Calcium carbonate equivalent (percent by weight) shall be 89 percent when tested in accordance with ASTM C 25.

3. Percent fineness (percent by weight) shall be as follows:

   a. Minimum material passing No. 20 sieve is 95 percent.

   b. Minimum material passing No. 60 sieve is 60 percent.

   c. Minimum material passing No. 100 sieve is 50 percent.

B. Furnish material having an effective neutralizing value (ENV) of not less than 90 when calculated according to 7 PA Code, Chapter 108, as follows:

1. Percent by weight passing No. 20 sieve minus percent passing No. 60 sieve multiplied by 0.4 equals (a).

2. Percent by weight passing No. 60 sieve minus percent passing No. 100 sieve multiplied by 0.8 equals (b).

3. Percent by weight passing No. 100 sieve multiplied by 1.0 equals (c).

4. Minimum calcium carbonate equivalent (CCE) equals percent by weight of calcium carbonate.

5. (a) plus (b) plus (c) multiplied by CCE divided by 100 equals ENV.

2.3.2 Commercial Fertilizer

Commercial fertilizer shall conform to the requirements of the Pennsylvania Soil Conditioner and Plant Growth Substance Law, Act of December 1, 1977, P.L. 258, No. 86 (3P.S.68.2), as amended. Use dry formulations of 10-20-20 analysis for seeded areas.

2.3.3 Slow-Release Nitrogen Fertilizer

Slow-release nitrogen fertilizer shall conform to the requirements of the Pennsylvania Soil Conditioner and Plant Growth Substance Law, Act of December 1, 1977, P.L. 258, No. 86 (3P.S.68.2) as amended. Use dry formulations of either 38-0-0 ureaform, 32-0-0 to 38-0-0 sulfur coated urea, or 31-0-0 IBDU and conform to the following requirements:

A. 38-0-0 ureaform shall contain the following:

   1. Total nitrogen (TN) shall be 38 percent minimum.

   2. Cold water insoluble nitrogen (WIN) shall be 25 percent minimum.

   3. Activity index (AI) shall be 40 percent minimum.

   4. Urea nitrogen shall be 3.5 percent minimum.

B. 32-0-0 to 38-0-0 sulfur coated urea with a 7-day dissolution range of 20 percent to 30 percent.

C. 31-0-0 IBDU shall be coarse grade (28 mils to 98 mils).

2.4 INOCULANT

Inoculant shall be a standard acceptable commercial product for treating leguminous seed and shall be a product consisting of a suitable carrier containing a culture of nitrogen-fixing bacteria specific for the seed to be inoculated. Keep lids on containers when not in use to avoid contamination. Do not use inoculant after the expiration date shown on the container.

2.5 HERBICIDES

Herbicides shall conform to all applicable Federal and State pesticide acts and registration requirements and as specified in PCID No. 1094 – Herbicides (Weed and Brush Control) issued by the Pennsylvania Department of General Services, Bureau of Purchases, Quality Assurance Division, for the appropriate type. Furnish herbicide in manufacturer's labeled container. In areas seeded with Seed Formulas B or D, use selective herbicide control with Type 1, Class C-2, 4-D Liquid Amine Salt Formulations (Dimethylamine) listed in PCID No. 1094, for controlling broadleaf weeds.

2.6 MULCH

Mulch shall be free from noxious weeds, mold, and other deleterious materials.

2.6.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice. Furnish straw in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

2.6.2 Hay

Hay shall be in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay shall be sterile and contain no fertile seed. Temporary seeding areas shall be mulched with hay.

2.6.3 Wood Cellulose Fiber Mulch

Use recovered materials of either 100 percent paper-based or 100 percent wood-based hydraulic mulch. Wood cellulose fiber mulch shall be processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of material application. Composition of wood cellulose fiber mulch on air-dry weight basis shall have moisture contents between 9 percent to 15 percent and a pH range from 5.5 to 8.2. Use wood cellulose fiber mulch with hydraulic application of grass seed and fertilizer.

2.6.4 Non-Asphaltic Tackifier

Non-asphaltic tackifier shall be a colloidal tackifier recommended by the fiber mulch manufacturer for slurry application and shall be nontoxic and free of plant growth or germination inhibitors.

2.7 WATER

Source of water shall be approved by Owner or appointed representative and shall be of suitable quality for irrigation, which contains no elements toxic to plant life.

PART 3 – EXECUTION

3.1 PREPARATION

3.1.1 Extent of Work

Protect structures, utilities, pavements, and other facilities, trees, shrubs, and plantings from damage caused by seeding operations. Protect adjacent and adjoining areas from hydroseeding overspray.

Provide soil preparation (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated or directed otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations. Prepare areas for seeding by uniformly applying soil supplements, except in areas that will receive Seed Formula E. Moisten prepared areas before seeding if areas are dry. In dry areas and prior to seeding, water in a manner that will not create muddy soil and allow the surface to dry.

3.1.2 Topsoil

Onsite topsoil shall be stripped and stockpiled for reuse or disposal in accordance with Section 31 00 00 EARTHWORK and as specified herein. Provide 4 inches of approved topsoil to meet the indicated finish grade. After areas have been brought to the indicated finish grade, incorporate soil supplements into the soil a minimum depth of 2 inches by disking, harrowing, tilling or other method approved by the Owner or appointed representative. Remove debris and stones larger than 1 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic. Do not spread topsoil when frozen or excessively wet or dry.

3.1.3 Soil Supplement Application Rates

Apply slow-release nitrogen fertilizer to the surface of Formulas B or D seeded areas before project completion. Apply soil supplements as follows, unless otherwise indicated:

DESCRIPTION	APPLICATION RATE (LBS/1,000 SY)
Pulverized Agricultural Limestone	800
10-20-20 Analysis Commercial Fertilizer	150
One of the following: 38-0-0 Ureaform Fertilizer 32-0-0 to 38-0-0 Sulfur Coated Urea Fertilizer 31-0-0 IBDU Fertilizer	 50 50 to 59 61

3.2 SEEDING

3.2.1 Seed Application Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy, frozen, snow covered, or in an unsatisfactory condition for seeding. Apply seed within 24 hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Prior to seed application of each designated seed formula, thoroughly clean out the seed tank by rinsing with clean water to prevent contamination from one seed formula to the next. Repeat rinsing cycle until tank is clean. Collect all non-applied seed derived from each clean out event and remove as waste from the project. Do not seed when wind velocities exceed 5 miles per hour.

3.2.2 Seed Application Method

Seeding method shall be broadcasted and drop seeding, drill seeding, or hydroseeding. Seed shall be sown at the rates specified in paragraph “Seeding Requirements” for the applicable formula and species.

3.2.2.1 Broadcast and Drop Seeding

Cover seed uniformly to a maximum depth of 1/4 inch in clay soils and 1/2 inch in sandy soils by means of spike-tooth harrow, cultipacker, raking, or other approved devices.

3.2.2.2 Drill Seeding

Use cultipacker seeders, grass seed drills, or other approved equipment. Seed shall be drilled uniformly to an average depth of 1/2 inch.

3.2.2.3 Hydroseeding

First, mix water and fiber. Then, add and mix seed and fertilizer to produce a homogeneous slurry. Seed shall be mixed to ensure broadcasting at the specified formula rates. Wood cellulose fiber mulch shall be applied as part of the hydroseeding operation. When hydraulically sprayed on the ground, material shall form a blotter like cover impregnated uniformly with grass seed. Spread with one-step application process with no second application of mulch.

3.3 INOCULATING LEGUMES

Inoculate leguminous seed with proper cultures according to the manufacturer's directions. Protect inoculated seed from prolonged exposure to sunlight before sowing. Re-inoculate seed as necessary or directed by the Owner or appointed representative. If using hydraulic seeders, use inoculant four times the manufacturer's recommended rate. If inoculated seed is held in a slurry with fertilizers for more than one hour, re-inoculate or apply legumes separately.

3.4 HERBICIDE APPLICATION

Apply herbicides to areas that are to be mowed and where weed growth is prominent. The Owner or appointed representative may designate existing plants or groups of plants to be saved within these areas before herbicide application. If directed by the Owner or appointed representative, more than one herbicide application may be required to control undesirable growth. Apply material with application personnel certified by the Department of Agriculture and approved equipment.

3.5 MULCHING

3.5.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 1,200 pounds per 1,000 square yards. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.5.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.5.3 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.6 ROLLING

Immediately after seeding, firm the entire area (except for slopes in excess of 3 horizontal to 1 vertical) with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed with cultipacker-type seeder or by hydroseeding, rolling may be eliminated. If the soil is wet or frozen, roll only when directed by the Owner or appointed representative.

3.7 WATERING

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 2 inches without runoff. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.8 PROTECTION OF SEEDED AREAS

Immediately after seeding, protect area against traffic and other use. Protect seeded areas on slopes greater than three horizontal to one vertical (3H:1V) with erosion control blankets as specified in Section 31 25 14 EROSION CONTROL BLANKETS.

3.9 RESTORATION

Restore existing turf areas to original condition which have been damaged during seeding operations at the Contractor's expense.

END OF SECTION

SECTION 33 40 00

STORM DRAINAGE AND WATERLINE UTILTIES (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for installation of piping for the principal spillway pipe, the low level outlet pipe and valve, the filter drainage diaphragm pipe and the relocated waterline pipe.

1.2 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM C 3350	(2010a) Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM D 1784	(2011) Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D 2321	(2011) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2729	(2011) Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3034	(2008) Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3212	(2007) Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D 3350	(2012) Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM D 4101	(2011) Standard Specification for Polypropylene Injection and Extrusion Materials
ASTM D 698	(2012) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D 6938	(2010) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

ASTM F 1417	(2011a) Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air
ASTM F 714	(2010) Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C500	(2009) Standard for Metal-Seated Gate Valves for Water Supply Service

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR1926 Safety and Health Regulations for Construction, Subpart P

1.3 SUBMITTALS

A. Submit shop drawings of the valve installation, including HDPE to valve connections, valve support details, and any other details required for a complete installation, and submit manufacturer's literature and installation instructions for the valve for approval, prior to furnishing onsite.

B. Submit product data on the pipe materials for approval prior to furnishing onsite.

C. Submit the PVC pipe manufacturer's resin certification, indicating the cell classification of PVC used to manufacture the pipe, for approval prior to installation of the pipe.

D. Submit the HDPE pipe manufacturer's resin certification, indicating the cell classification of PE used to manufacture the pipe prior to installation of the pipe. The minimum cell classification for PE plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D 3350.

E. Submit shop drawings of the valve stem guide installation, including connection to valve, guide support details in manhole, valve stand at surface and any other details required for a complete installation, and submit manufacturer's literature and installation instructions for the actuator for approval, prior to furnishing onsite.

F. Submit printed copies of the manufacturer's recommendations for installation procedures of the pipe material being placed for approval prior to installation.

G. Submit density and moisture content test results within 7 days after completion of testing.

H. Submit certified test reports showing the installed piping meets or exceeds the testing requirements prior to acceptance.

I. Submit certified test reports from the manufacturer showing the valve meets or exceeds the hydrostatic shell and seat testing requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to project site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the project site at all times and follow these instructions, unless otherwise directed by the Owner or their appointed representative. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench or excavation in sound, undamaged condition. Pipe shall be carried, not dragged.

PART 2 – PRODUCTS

2.1 POLYVINYL CHLORIDE PIPE

2.1.1 Solid PVC Pipe

Solid pipe shall be solid wall polyvinyl chloride (PVC) pipe and shall be in accordance with ASTM D 3034, Type PSM, maximum SDR 35, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.2 Perforated PVC Pipe

Perforated PVC pipe for subsurface drainage piping shall be in accordance with ASTM D 2729. Perforations shall be manufactured in the piping by the pipe manufacturer and shall be circular or slotted. Field perforating pipe will be permitted with approval of the Owner or their appointed representative.

A. For circular perforations, provide holes with a nominal diameter not less than 3/16 inch or greater than 3/8 inch. Provide similar rows of perforations on both sides of the pipe’s vertical centerline, with the lower most rows separated by an arc of 60 degrees minimum.

B. For slotted perforations, provide slots not exceeding 1/8 inch wide and a length of not more than 10 percent of the average inside circumference of the pipe. Center the slots at maximum 120 degree intervals about the pipe circumference.

2.2 High Density Polyethylene (HDPE) Pipe

Reservoir pipe and process pipe shall be high-density polyethylene (HDPE) pipe and shall be in accordance with ASTM F 714, smooth wall, ductile iron pipe size (DIPS), maximum DR of 26, with sizes as shown on the Drawings. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 335434C.

2.3 JOINTS

2.3.1 PVC Pipe Joints

Joints shall be solvent cement or elastomeric gasket type in accordance with the specification for the pipe and as recommended by the pipe manufacturer.

2.3.2 Precast Concrete Structure Joints

Joints for precast structures shall meet the requirements of Section 03 40 00 PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION.

2.3.3 HDPE Joints

HDPE pipe shall be joined using butt fusion method as recommended by the pipe manufacturer. Provide all wall anchors, stub ends, fabricated elbows, and back up flanges as recommended by the pipe manufactured for complete pipe installation as shown on the Drawings. Bolt pattern of back up flanges shall match the valve bolt pattern.

2.4 VALVE

The valve for the saltwater drainage pipe shall be Nibco F-617-O gate valve or an equivalent valve approved by the Owner or his appointed representative, with the diameters and flange sizes shown on the Drawings. The valve shall have the manufacturer’s name, pressure rating, and year in which the valve was manufactured cast on the body. Valve shall be manufactured in accordance with AWWA C500 and shall be designed for a working pressure of 150 pounds per square inch. The flange shall be adaptable to ANSI B16.5 Class 150 and be capable of fitting to HDPE pipe. Provide gate valve with an adequate valve support as recommended by the valve manufacturer or as designed by the Contractor.

2.5 VALVE ANCILLARY COMPONENTS

Valve ancillary components to facilitate operation of the valve shall be compatible with the valve selected.

2.6 MISCELLANEOUS ACCESSORIES

A. Pipe Marking Tape: Pipe marking tape shall be installed over all buried piping. The tape shall be 6” wide and 0.004” thick, manufactured from polyethylene, blue in color with black letters and wording “CAUTION BURIED WATER LINE”. Seton Style 37244 or approved equal.

B. Pipe locating wire shall be installed over all buried piping. Locating wire shall be a 12 Ga. Single strand bare copper wire strapped to the underground HDPE pipe with plastic cable ties spaced every ten (10) feet.

C. Bolts: All bolts, nuts, and washers (except anchor bolts) are to be galvanized and sprayed with Agal-Coat® and are to be of appropriate lengths and diameters.

2.7 HDPE FITTINGS, CUSTOM FABRICATIONS AND FLANGE ADAPTORS

A. HDPE fittings, custom fabrications and flange adaptors shall be molded or fabricated by the pipe manufacturer and shall be pressure rated to match the pipe SDR pressure rating to which they are joined unless otherwise specified on the plans or approved in writing by the Owner of his appointed representative. Resin, cell classification and markings for fittings, custom fabrications and flanged adaptors shall meet the requirements in Paragraph "High Density Polyethylene Pipe".

B. Molded fittings: Molded fittings shall be manufactured and marked in accordance with ASTM D3261 and shall be tested in accordance with AWWA C906 and ASTM D3261.

C. Fabricated fittings: Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock or molded fittings. Fabricated fittings shall be tested in accordance with AWWA C906 and ASTM D3261.

D. Flange Adapters: All flange adapters sized 12" and smaller shall be molded. Larger flange adaptors shall be manufactured by the butt-fusion method and meet the requirements of ASTM D3261. All flange adapters shall exhibit a minimum pressure rating equal to that of the HDPE pipe. Extrusion-welded fittings will not be accepted.

E. Back-up Rings: All rings are to be 150 pound manufactured using grade 80-55-06 ductile iron and meeting ASA drilling and ASTM A536 requirements.

F. Reducers: All reducers sized 10" x 8" and smaller shall be molded. Larger reducers shall be fabricated using the butt-fusion method or prefabricated by the manufacturer. All reducers shall be SDR-11 or SDR-17 and shall meet the requirements of ASTM D2513 and ASTM D3261. All reducers shall exhibit a minimum pressure rating equal to that of the HDPE pipe. Extrusion welded fittings will not be accepted.

G. Tees or Branch Saddles: All tees sized 6" and smaller shall be molded. Larger tees shall be fabricated using the butt-fusion method or prefabricated by the manufacturer. All fabricated tees shall be full-sized three piece mitered tees using SDR-11 or SDR-17 pipe and shall meet the requirements of ASTM D2513 and ASTM D3261. All tees shall exhibit a minimum pressure rating equal to that of the HDPE pipe. Extrusion welded fittings will not be accepted.

H. Elbows: All elbows sized 8" and smaller shall be molded. All larger fabricated elbows shall be manufactured by the butt-fusion method or prefabricated by the manufacturer. All elbows shall use SDR-11 or SDR-17 pipe and shall meet the requirements of ASTM D2513 and ASTM D3261. All elbows shall exhibit a minimum pressure rating equal to that of the HDPE pipe. Extrusion welded fittings will not be accepted.

I. HDPE to Stainless Steel Transition Fitting: All transition fittings shall be HDPE SDR-11 and SS304 stainless steel. All transition fittings must have a minimum pressure rating equal to that of the HDPE pipe. Absolutely no extrusion-welded fittings will be acceptable.

J. Gaskets: Nitrile only.

K. Blind Flanges: Blind flanges shall be molded with a minimum 150-psi pressure rating and shall meet the requirements of ASTM D2513 and ASTM D3261.

L. Caps: Caps shall be molded and shall meet the requirements of ASTM D2513 and ASTM D3261.

2.8 BUTT FUSION EQUIPMENT

For 6” and larger pipe sizes, the pipe butt fusion machine shall be a hydraulic fusion machine capable of butt fusing HDPE pipe. The carriage must be removable from the chassis for in-ditch use. The machine must be compatible with an electronic data recording device, McElroy DataLogger or equal. Accessories will include all butt fusion inserts for the specified range of pipe sizes, a pyrometer kit for checking the surface temperature of the heater, extension cord (25' minimum), and hydraulic extension hoses (minimum of four). The butt fusion machine will be McElroy, or approved equivalent.

2.9 HYDROSTATIC TEST ON WATERTIGHT JOINTS

2.9.1 HDPE Watertight Joints

A hydrostatic test shall be made on the HDPE watertight joint proposed. Only one sample joint of each type needs testing; however, if the sample joint fails because of faulty design or workmanship, an additional sample joint may be tested. During the test period, jointing material shall be protected from extreme temperatures which might adversely affect the performance of such materials. Performance test requirements for joints in PE plastic pipe shall conform to ASTM D 3212.

2.10 BACKFILL SOILS

Soils for use in backfilling pipe shall meet the requirements of Section 31 00 00 EARTHWORK.

PART 3 – EXECUTION

3.1 PIPE EXCAVATION

3.1.1 Trenching

Excavate trenches as recommended by the manufacturer of the pipe to be installed. Provide vertical trench walls where no manufacturer's printed installation manual is available and if trench is less than 5 feet in depth. Trench walls shall be in accordance with OSHA standards for the depth of the trench excavated. Provide a trench width that allows for a minimum of 15 inches of work space on either side of the pipe to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe, or as shown on the Drawings. Give special attention to slopes which may be adversely affected by weather or moisture content. Shore trench walls, cut back to a stable slope, or provide an equivalent means of protection for work adjacent to trenches in unstable soil or susceptible to cave in. Excavate trench walls which are cut back to at least the angle of repose of the soil.

3.1.2 Structure Excavation

Make excavations to the lines, grades, and elevations shown, or as directed. Provide trenches and foundation pits of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations. Clean rock or other hard foundation material of loose debris and cut to a firm, level, stepped, or serrated surface. Remove loose disintegrated rock and thin strata. Do not disturb the bottom of the excavation when concrete is to be placed in an excavated area. Do not excavate to the final grade level until just before the concrete is to be placed.

3.1.3 Removal of Rock

Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or 1/2 inch for each foot of fill over the top of the pipe, whichever is greater, but not more than three-fourths the nominal diameter of the pipe. Where bell-and-spigot pipe is used, the cushion shall be maintained under the bell as well as under the straight portion of the pipe. Rock excavation shall be as specified and defined in Section 31 00 00 EARTHWORK

3.1.4 Removal of Unyielding Material

Where overdepth is not indicated and unyielding material is encountered in the bottom of the trench, remove such material 4 inches below the required grade and replace with satisfactory materials specified in Section 31 00 00 EARTHWORK or the appropriate aggregate material specified in Section 31 05 16 AGGREGATES FOR EARTHWORK. Replacement material shall be approved by the Owner or their appointed representative prior to placement.

3.1.5 Removal of Unstable Material

Where wet or otherwise unstable material incapable of properly supporting the pipe is unexpectedly encountered in the bottom of a trench, as determined by the Owner or their appointed representative, such material shall be removed to the depth required and replaced to the proper grade and compacted. Replacement material shall be satisfactory material specified in Section 31 00 00 EARTHWORK or the appropriate aggregate material specified in Section 31 05 16 AGGREGATES FOR EARTHWORK, and shall be approved by the Owner or their appointed representative prior to placement. When removal of unstable material is due to the fault or neglect of the Contractor during shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed by the Contractor at no additional cost to the Owner.

3.1.6 Bottom Preparation

Grade the bottom of trenches accurately to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Excavate bell holes to the necessary size at each joint or coupling to eliminate point bearing. Remove stones of 3 inches or greater in any dimension or as recommended by the pipe manufacturer, whichever is smaller, to avoid point bearing.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 PVC and HDPE Pipe Bedding

Bedding for PVC and HDPE pipe shall meet the requirements of ASTM D 2321. Bedding, haunching, and initial backfill shall be soils excavated to facilitate trench excavation or coarse aggregate with the gradation and quality requirements specified in Section 31 05 16 AGGREGATES FOR EARTHWORK.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to placement, if necessary, to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper equipment shall be provided for lowering sections of pipe into trenches. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (PERCENT)
PVC Pipe	5
HDPE PIPE	5

3.3.1 PVC Pipe Placement

Pipe placement shall proceed upgrade with spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow.

3.3.2 HDPE Pipe Placement

Pipe placement shall be in accordance with the pipe manufacturer's recommendations.

3.4 JOINTING

3.4.1.1 Flexible Watertight, Gasketed Joints

Installation shall be as recommended by the gasket manufacturer for use of lubricants, cements, and other special installation requirements. The gasket shall be placed over one end of a section of pipe for half the width of the gasket. The other half shall be doubled over the end of the same pipe. When the adjoining section of pipe is in place, the doubled-over half of the gasket shall then be rolled over the adjoining section. Any unevenness in overlap shall be corrected so that the gasket covers the end of pipe sections equally. Connecting bands shall be centered over adjoining sections of pipe, and rods or bolts placed in position and nuts tightened. The bands shall be tightened as follows:

A. The band shall be tightened evenly, even tension being kept on the rods or bolts, and the gasket

B. The gasket shall seat properly in the corrugations.

C. Watertight joints shall remain uncovered for a period of time designated, and before being covered, tightness of the nuts shall be measured with a torque wrench.

D. If the nut has tended to loosen its grip on the bolts or rods, the nut shall be retightened with a torque wrench and remain uncovered until a tight, permanent joint is assured.

3.4.2 PVC Pipe Joints

Jointing shall be in accordance with the manufacturer's recommendations, including use of solvents and cements.

3.4.3 HDPE Pipe Joints

Joints between plain end pipes and fittings shall be made by butt fusion. The butt fusion procedures used shall be procedures that are recommended by the pipe and fitting manufacturer. The Contractor shall ensure that persons making butt fusion joints have received training in the manufacturer's recommended procedure. The Contractor shall maintain records of trained personnel and shall certify that training was received not more than 12 months before commencing construction. External and internal beads shall not be removed.

3.5 VALVE INSTALLATION

The valve shall be installed in accordance with the manufacturer's written recommendations and as shown on the Drawings. Valve components shall be installed in accordance with the manufacturer's written recommendations and as shown on the Drawings.

3.6 BACKFILLING

3.6.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, satisfactory material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The satisfactory material shall meet the physical properties of the soil zone material into which the trench was excavated. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation of at least 12 inches above the top of the pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacting by mechanical rammers or tampers in layers not exceeding 8 inches loose thickness. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below, but shall be tested at least once per each location of pipe installation. Sheeting or shoring required for pipe installation shall not be left in place.

3.6.2 Backfilling Pipe in Fill Sections

A. For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified herein. The Fill material shall possess the properties of the soil zone into which the pipe is installed. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be ramped against the pipe at a slope of 6H:1V to aid in forcing the fill against the pipe and to reduce the potential for the compaction equipment to contact the pipe. Compaction shall be performed by rolling parallel with pipe or by mechanical tamping or ramming. Compaction of pipe with diameters of 6-inches or less shall be performed with tampers or wackers with weights greater than 100 pounds. Large compaction equipment shall not be used within 2 feet of 6-inch diameter pipe. Lift thickness shall be four inches for compaction by wackers or tampers and shall be brought up equally on both sides of the pipe, to reduce lateral movement.

B. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding 8 inches loose thickness. Scarify the top of the existing lift prior to placement of a new lift.

C. Inspect the placement of fill to avoid dessication.

3.6.3 Trench Backfill During Pipe Pressure Testing

Trenches shall be backfilled a minimum of 2 feet above the top of the pipe prior to performing the required pressure tests. Leave the joints and couplings uncovered during testing. Do not backfill the trench until all specified tests are performed.

3.6.4 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a pipe at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced by the Contractor at no expense to the Owner.

3.7 COMPACTION

3.7.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.7.2 Minimum Density

Backfill over and around the pipe, and backfill around and adjacent to structures, shall be compacted to a density of at least 90 percent of maximum density for cohesive materials and 95 percent of maximum density for cohesionless materials, and shall be within 3 percent of optimum moisture content. Aggregates used for pipe bedding, haunching, and initial backfill shall be compacted to non-movement to prevent breakdown of the material as specified in Section 31 05 16 AGGREGATES FOR EARTHWORK.

3.8 DETERMINATION OF DENSITY

Testing is the responsibility of the Contractor and performed at no additional cost to the Owner. Testing shall be performed by an approved commercial testing laboratory or by the Contractor and subject to approval by the Owner or their appointed representative. Tests shall be performed in sufficient number to ensure that specified density is being obtained, but shall be tested at least once per each location of pipe installation. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 698, except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D 6938. The calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph “Calibration” of the referenced publications. ASTM D 6938 results in a wet unit weight of soil and ASTM D 6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 6938. Test results shall be furnished the Owner or their appointed representative. The calibration checks of both the density and moisture gauges shall be made at the beginning of a project on each different type of material encountered and at intervals as directed.

3.9 PIPE TESTING

3.9.1 Leakage Tests

Lines shall be tested for leakage by low pressure air or water testing, as appropriate. Low pressure air testing for HDPE pipe shall conform to ASTM F 1417. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished.

3.9.2 Deflection Testing

No sooner than 30 days after completion of installation and final backfill, an initial post installation inspection shall be accomplished. Clean or flush all lines prior to inspection. Perform a deflection test on entire length of installed flexible pipeline on completion of work adjacent to and over the pipeline, including backfilling, placement of fill, grading, and any other superimposed loads. Deflection of pipe in the installed pipeline under external loads shall not exceed limits in paragraph “Placing Pipe” as percent of the average inside diameter of pipe. Determine whether the allowable deflection has been exceeded by use of a laser profiler or mandrel.

A. Laser Profiler Inspection: If deflection readings in excess of the allowable deflection of average inside diameter of pipe are obtained, remove pipe which has excessive deflection, and replace with new pipe. Initial post installation inspections of the pipe interior with laser profiling equipment shall utilize low barrel distortion video equipment for pipe sizes 48 inches or less. Use a camera with lighting suitable to allow a clear picture of the entire periphery of the pipe interior. Center the camera in the pipe both vertically and horizontally and be able to pan and tilt to a 90 degree angle with the axis of the pipe rotating 360 degrees. Use equipment to move the camera through the pipe that will not obstruct the camera's view or interfere with proper documentation of the pipe's condition. The video image shall be clear, focused, and relatively free from roll static or other image distortion qualities that would prevent the reviewer from evaluating the condition of the pipe.

B. Pull-Through Device Inspection: Pass the pull-through device through each run of pipe by pulling it by hand. If deflection readings in excess of the allowable deflection of average inside diameter of pipe are obtained, retest pipe by a run from the opposite direction. If retest continues to show excess allowable deflections of the average inside diameter of pipe, remove pipe which has excessive deflection, replace with new pipe, and completely retest in same manner and under same conditions. The mandrel shall be rigid, nonadjustable having a minimum of 9 fins, including pulling rings at each end, engraved with the nominal pipe size and mandrel outside diameter. The mandrel shall be 5 percent less than the certified-actual pipe diameter for plastic pipe and 5 percent less than the certified-actual pipe diameter for CMP provided by manufacturer. When mandrels are utilized to verify deflection of flexible pipe products, the Contractor, in the presence of the Owner or their appointed representative, will verify the mandrel outside diameter through the use of proving rings that are manufactured with an opening that is certified to be as shown above.

C. Deflection Measuring Device: Deflection measuring device shall be approved by the Owner or their appointed representative prior to use.

D. Warranty Period Test: Pipe found to have a deflection of greater than allowable deflection in paragraph "Placing Pipe" just prior to the end of one-year warranty period shall be replaced with new pipe and tested as specified for deflection. Inspections shall be made, depending on the pipe size, with video camera or visual observations. In addition, perform deflection testing on 100 percent of all accessible pipes with either a laser profiler or 9-fin mandrel. When mandrels are utilized to verify deflection during the final post installation inspection, the Contractor, in the presence of the Owner or their appointed representative, will verify the mandrel outside diameter through the use of proving rings.

3.9.3 Post-Installation Inspection

A. One hundred percent of all flexible pipes (PVC and HDPE) shall be inspected and checked for rips, tears, joint separations, soil migration through the joint, cracks, localized bucking, bulges, settlement, and alignment. *The inspection shall include a video survey of all installed pipe. The video shall be performed with sufficient lighting and shall document the entire circumference of the pipe. A digital distance from the start/point of entry of the video shall be provided*.

B. Replace pipes having cracks greater than 0.1 inches in width or deflection greater than 5 percent deflection. A registered professional civil engineer licensed within the *State of Ohio* shall evaluate all pipes with cracks greater than 0.01 inches, but less than 0.10 inches to determine if any remediation or repair is required. Repair or replace any pipe with crack exhibiting displacement across the crack, exhibiting bulges, creases, tears, spalls, or delamination.

C. The deflection results and final post installation inspection report shall include a DVD copy of all video taken, pipe location identification, equipment used for inspection, inspector name, deviation from design, grade, deviation from line, deflection and deformation of pipe systems, inspector notes, condition of joints, and condition of pipe wall (e.g., distress, cracking, wall damage dents, bulges, creases, tears, holes, etc.).

3.10 VALVE TESTING

A. Prior to shipment from the manufacturer, the valve shall be hydrostatically shell tested at a pressure indicated in the manufacturer's installation guide. In addition, the gate valve shall be hydrostatically seat tested at a pressure of 150 pounds per square inch.

B. Subject the gate to functional testing in the presence of the Owner or appointed representative. Cycle each gate to confirm that they operate without binding, scraping or distorting. The effort to open and close the gate shall be measured, and shall not exceed the maximum operating effort specified in the Manufacturers Installation Guide. Repeat the test as many times as necessary to secure a properly tested working unit. The Contractor shall be responsible for the coordination of the tests. Gate leakage, when subjected to the specified heads shall not exceed 0.05GPM per linear feet of seal perimeter (seating head condition) and 0.10 gpm per linear feet of seal perimeter (unseating head). Any leakage in excess of the allowable specified shall be corrected and the equipment retested.

END OF SECTION

SECTION 35 31 19.40

STONE REVETMENTS (10-19-19)

PART 1 – GENERAL

1.1 SUMMARY

This Section addresses the requirements for furnishing and installing riprap as stone revetment and within erosion and sediment control measures to be performed under this Contract.

1.2 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM C 127	(2007) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C 295/C 295M	(2011) Standard Guide for Petrographic Examination of Aggregates for Concrete
ASTM D 3740	(2011) Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D 4992	(2007) Standard Practice for Evaluation of Rock to be Used for Erosion Control
ASTM D 5312	(2004) Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
ASTM D 5313	(2004) Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions
ASTM D 5519	(2007) Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT)

PENNDOT Bulletin 14	(2011) Aggregate Producers

1.3 SUBMITTALS

A. If stone is furnished from a source not listed in PENNDOT Bulletin 14, submit certification that the laboratory meets the requirements of ASTM D 3740 and is capable of performing the specified required tests. A copy of all inspection reports and individual test documents that validates the laboratory shall be provided with the certification, along with the name of the individual performing the laboratory inspection and the date of the inspection.

B. If stone is furnished from a source not listed in PENNDOT Bulletin 14, submit the results of evaluation testing of stone for approval.

C. Submit test results performed on all of the stone types, including gradation tests, for approval.

D. Submit certificates for all stone materials stating the materials are in compliance with all the specified requirements of these Contract Specifications.

1.4 QUALITY ASSURANCE

1.4.1 General

All stone shall be durable material as approved by the Owner or appointed representative. Selected stone from the required excavations and demolished concrete may be used if it satisfies all requirements as to quality and dimensions. Demolished concrete shall also meet the requirements of Section 02 41 00 DEMOLITION AND DECONSTRUCTION. Stone shall be of a suitable quality to ensure permanence in the placement area and in the climate in which it is to be used. Stone shall be free from cracks, blast fractures, bedding, seams, and other defects that would tend to increase its deterioration from natural causes. Inspections for cracks, fractures, seams, and defects shall be made by visual examination. If, by visual examination, it is determined that 20 percent or more of the stone produced contains hairline cracks, then all stone produced by the means and measures which caused the fractures shall be rejected. A hairline crack that is defined as being detrimental shall have a minimum width of 4 mils and shall be continuous for one-third the dimension of at least two sides of the stone. The stone shall be clean and adequately free from all foreign matter. Any foreign material adhering to or combined with the stone as a result of stockpiling shall be removed prior to placement.

1.4.2 Sources

Stone shall be supplied from one source and shall be furnished from an approved Type A aggregate producer listed in PENNDOT Bulletin 14, unless otherwise directed or approved by the Owner or appointed representative. If stone is furnished from a source not listed in PENNDOT Bulletin 14, the Contractor shall meet the requirements specified in paragraph “Evaluation Testing of Stone”.

1.4.3 Evaluation Testing of Stone

If the Contractor proposes to furnish stone from a source not listed in PENNDOT Bulletin 14, the Contractor shall have evaluation tests performed on stone samples collected from the proposed source. The quarry investigation shall be performed by a registered professional geologist or registered professional engineer licensed within the Commonwealth of Pennsylvania and employed by the Contractor. The tests to which the stone shall be subjected to include petrographic examination (ASTM C 295/C 295M), bulk specific gravity (SSD), unit weight, absorption (ASTM C 127), resistance of stone to freezing and thawing (ASTM D 5312), and if argillaceous limestone and sandstone are used, resistance to wetting and drying (ASTM D

5313). The laboratory to perform the required testing shall be validated based on relevant paragraphs of ASTM D 3740, and no work requiring testing shall be permitted until the laboratory has been inspected and validated by the Contractor and certification has been provided that the laboratory meets the requirements of ASTM D 3740 and is capable of performing the required tests. All costs associated with laboratory inspections and completing evaluation testing of stone shall be borne by the Contractor.

A. Bulk Specific Gravity Range: All stone shall have a minimum bulk specific gravity, saturated surface dry (SSD), of 2.50 and a maximum bulk specific gravity of not more than 2.90 based upon water having a unit weight of 62.4 pounds per cubic foot. The testing method for bulk specific gravity (SSD) shall be ASTM C 127.

B. Unit Weight and Absorption: Stone shall weigh more than 155 pounds per cubic foot. The stone shall have absorption less than 2 percent. The method of test for unit weight and absorption shall be ASTM C 127.

C. Petrographic Examination: Stone shall be evaluated in accordance with ASTM C 295/C 295M, which shall include information required by ASTM D 4992, Paragraph 10.

D. Resistance to Freezing and Thawing: Stone shall have a maximum loss of 5 percent after the number of cycles specified in ASTM D 5312, Figure 1, when determining the durability of stone when subjected to freezing and thawing, except the surface area of one side of the sample shall be between 144 and 2,304 square inches.

E. Resistance of Rock to Wetting and Drying: Stone shall have a maximum loss of 1 percent when determining the durability of stone when subject to wetting and drying in accordance with ASTM D 5313, except the surface area of one side of the sample shall be between 144 and 2,304 square inches.

F. Tests: Conduct the tests in accordance with applicable ASTM methods of tests in a laboratory validated by the Contractor as specified herein.

1.5 CONSTRUCTION TOLERANCES

The finished surface and stone layer thickness shall not deviate from the lines and grades shown by more than the tolerances listed below. Tolerances are measured perpendicular to the indicated neat lines. Extreme limits of the tolerances given shall not be continuous in any direction for more than five times the nominal stone dimension nor for an area greater than 200 square feet of the surface. The intentions are that the work shall be built generally to the required elevations, slopes, and grades and that the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked by the Contractor as directed by the Owner or appointed representative. Payment will not be made for excess material which the Owner or appointed representative permits to remain in place.

NEAT LINE TOLERANCES		
MATERIAL	ABOVE NEAT LINE	BELOW NEAT LINE
PENNDOT R-3	2 inches	1 inch
PENNDOT R-4	3 inches	1-1/2 inches
PENNDOT R-5	4 inches	2-1/2 inches

PART 2 – PRODUCTS

2.1 GEOTEXTILE

Geotextile placed beneath stone shall be woven geotextile in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK.

2.2 STONE

A. Stone shall be of an acceptable quality, sound, durable, free from structural defects and foreign substances such as oil, shale, and organic materials. Only quarried stone shall be used. Stone shall conform to the following requirements.

1. Stone shall contain no shale seams.

2. Hard and angular shaped stone meeting the requirements of paragraph “Proportional Dimension Limitations”.

3. Minimum bulk specific gravity, saturated surface dry (SSD), of 2.50 in accordance with ASTM C 127.

4. Each load of stone shall be well-graded from the smallest to the largest stone.

B. Stone shall have the following sizes, gradations, and nominal placement thicknesses.

PENNDOT R-3 STONE	
ROCK SIZE (INCHES)	PERCENT PASSING (SQUARE OPENINGS)
6	100*
3	15 – 50
2	0 – 15
Nominal Placement Thickness (Inches)	12

* Denotes maximum allowable stone size for the gradation.

PENNDOT R-4 STONE	
ROCK SIZE (INCHES)	PERCENT PASSING (SQUARE OPENINGS)
12	100*
6	15 – 50
3	0 – 15
Nominal Placement Thickness (Inches)	18

* Denotes maximum allowable stone size for the gradation.

PENNDOT R-5 STONE	
ROCK SIZE (INCHES)	PERCENT PASSING (SQUARE OPENINGS)
18	100*
9	15 – 50
4	0 – 15
Nominal Placement Thickness (Inches)	24

* Denotes maximum allowable stone size for the gradation.

PART 3 – EXECUTION

3.1 BASE PREPARATION

Areas on which geotextile and riprap are to be placed shall be graded and/or dressed to conform to the cross sections shown on the Contract Drawings within an allowable tolerance specified herein from the theoretical slope lines and grades. Where such areas are below the allowable minus tolerance limit, they shall be brought to grade by fill with satisfactory or structural cohesive materials specified in Section 31 00 00 EARTHWORK and then compacted to a density equal to the adjacent in place material. Immediately prior to placing the geotextile, the prepared base will be inspected by the Owner or appointed representative and no material shall be placed thereon until that area has been approved.

3.2 GEOTEXTILE PLACEMENT

Placement of geotextile beneath stone shall be in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK.

3.3 PLACEMENT OF STONE

3.3.1 General

Stone shall be placed on the geotextile within the limits and at the locations shown on the Drawings.

3.3.2 Stone in Railroad Channel

Stone placed in the railroad channel shall be placed in one lift over the existing riprap stone to the extent shown on the Drawings. Taper the lift of stone into existing stone at each end and at the top of the slopes to create a gradual transition. Excavate existing stone as needed at each end of the stone placement to maintain a new tie-in stone thickness of 4-inches.

3.3.3 Placement

Stone shall be placed in such manner as to produce a well-graded mass of stone with the minimum practicable percentage of voids, and shall be constructed within the specified tolerances to the lines and grades shown on the Drawings. Placement shall begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Construction tolerances from the slope lines and grades shown on the Drawings and in accordance with paragraph “Construction Tolerances” will be allowed in the finished surface of the stone. The average tolerance of the entire project shall have no more than 50 percent of the tolerance specified. No stone shall be dropped through air from a height greater than 3 feet and stones heavier than 500 pounds shall not be dropped from a height greater than 2 feet. The larger stones shall be well distributed and the entire mass of stones in their final position shall be roughly graded to conform to the gradation specified in paragraph "Stone". The finished stone mass shall be free from objectionable pockets of small stones and clusters of larger stones. Placing stone in layers will not be permitted. Placing stone by dumping into chutes or by similar methods likely to cause segregation of the various sizes will not be permitted. Placing stone by dumping it at the top of the slope and pushing it down the slope will not be permitted. No equipment shall be operated directly on the completed stone. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source, by controlled dumping of successive loads during final placement, or by other methods of placement which will produce the specified results. All dump trucks used in placing the stone shall be equipped with bottom hinged tailgates. The gate releasing mechanism shall be arranged so that it may be operated only from, at, or near the front of the truck. Rearranging of individual stones will be required to the extent necessary to obtain a well-graded distribution of stone sizes as specified above. Maintain the stone until accepted by the Owner or appointed representative; any material displaced by any cause shall be replaced to the lines and grades shown on the Drawings at no additional expense to the Owner.

3.4 TESTS AND INSPECTIONS

3.4.1 Gradation Tests

Perform gradation test(s) on the stone at the quarry in accordance with ASTM D 5519, Test Method A. At least one gradation test shall be performed per 25,000 tons of each size of stone placed, but not less than one test shall be performed. The gradation tests shall be reported using industry standard gradation reporting forms and charts. The sample shall consist of not less than 5 tons of stone and shall be collected in a random manner which will provide a sample which accurately reflects the actual gradations arriving at the jobsite. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and all stone represented by the failed tests shall be set aside and not incorporated into the work. Any additional tests required because of the failure of an initial test sample will not be considered as one of the other required tests. If collected by the truckload, each truckload shall be representative of the gradation requirements. The Owner or appointed representative may direct additional testing of the stone at the project site if the stone appears, by visual inspection, to be out of gradation. Provide all necessary screens, scales, other equipment, and operating personnel to grade the sample. Certification and test results shall represent stone shipped from the quarry and must be received by the Owner or appointed representative at the jobsite before the stone is used in the work.

3.4.2 Proportional Dimension Limitations

The maximum aspect ratio (greatest dimension:least dimension) of any piece of stone for size ranges shall be not greater than 3:1 when measured across a mutually perpendicular axis. Not more than 25 percent of the stones within a gradation range shall have an aspect ratio greater than 2.5:1.

3.4.3 Stone Stockpile

Storage of stone at the worksite is not to be confused with offsite stockpiling of stone. If the Contractor elects to provide offsite stockpiling areas, the Owner or appointed representative shall be notified of all such areas. The Contractor's stockpile shall be a maximum of 12 feet high and formed by a series of layers of truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 10 feet from the edge of the previous layer so that the rock will not roll down the edges of the previous layers. The first layer shall be a maximum of 6 feet high. After being stockpiled, any stone which has become contaminated with soil or refuse shall not be put into the work unless the contaminating material has been removed from the stone prior to placement.

A. Worksite Stockpile: Stone delivered to the worksite, which requires temporary storage, shall be placed in a container suitable for storing the stone without waste or a crushed stone pad may be constructed for the storage area and removed upon completion of the work. If the crushed stone pad method is used, the pad shall have a minimum thickness of at least 6 inches. The container or crushed stone pad method shall be subject to approval by the Owner or appointed representative prior to delivery of the stone. Upon completion of the work, the storage areas shall be cleaned of all storage residues and returned to their natural condition. Temporary storage of stone at the worksite will be allowed, provided the stockpile toe of the stone is no closer than 100 linear feet from the closest edge of the excavation's top slope.

B. Offsite Stockpile: In areas where stone is stockpiled for placement, the area shall have excess stone removed prior to completion of work. All stone greater than 3 inches in diameter shall be removed. Where stones may have become buried due to soft ground or operation of the equipment, the stone shall be removed and disposed of by the Contractor. After the stone has been removed, the storage area shall be graded, dressed, and filled to return the ground surface as near as practical to the condition that existed prior to construction.

3.4.4 Placement Control

3.4.4.1 Quality Control Measures

Establish and maintain quality control for all work performed at the project site under this Section to assure compliance with contract requirements. Maintain records of the quality control tests, inspections, and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the placement of all materials to the slope and grade lines shown and in accordance with this Section.

3.4.4.2 Check Surveys

Surveys made by the Contractor are required on each material placed for determining that the materials are acceptably placed in the work. Make checks as the work progresses to verify lines, grades, and thicknesses established for completed work. Following placement of each type of material, the cross section of each step of the work shall be approved by the Owner or appointed representative before proceeding with the next step of the work. Approval of cross sections based upon check surveys shall not constitute final acceptance of the work. Cross sections shall be taken on lines 25 feet apart, measured along the placement reference line, with readings at 5 foot intervals and at breaks along the lines. However, other cross section spacing and reading intervals may be used if determined appropriate by the Owner or appointed representative. Additional elevations shall be taken as the Owner or appointed representative may deem necessary or advisable. The surveys shall be conducted in the presence of the Owner or appointed representative, unless this requirement is waived by the Owner. The elevation of the stone surface shall be determined by the use of a leveling instrument and a rod having a base 12 inches in diameter. If approved by the Owner or appointed representative, other means may also be used.

END OF SECTION

SECTION 35 31 19.41

PRECAST ARTICULATED CONCRETE REVETMENTS

PART 1 – GENERAL

1.1 SUMMARY

The contractor shall furnish all labor, materials, equipment, and incidentals required for, and perform all operations in connection with, the installation of the ArmorFlex® Articulating Concrete Block (ACB) system in accordance with the lines, grades, design and dimensions shown on the Contract Drawings and as specified herein.

1.2 REFERENCES

ACI INTERNATIONAL (ACI)

ACI 117	(2010) Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 301	(2010) Specifications for Structural Concrete
ACI 347	(2004; Errata 2008) Guide to Formwork for Concrete

ASTM INTERNATIONAL (ASTM)

ASTM C 1077	(2011b) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 31/C 31M	(2010) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 39/C 39M	(2011) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Certification of successful completion of full-scale laboratory testing in accordance with the current version of ASTM D 7277, *Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow*. This certification shall comprise a final test report from the testing facility, or a summary test report from the testing facility providing the test procedure and the obtained Critical Shear Stress parameters of the tested block. Third-party testimonies of compliance shall not be sufficient to satisfy this requirement.

B. Factor of Safety (FoS) calculations in support of the proposed ACB system

C. An appropriate geotextile, selected for the site being protected on the basis of the gradation and permeability of the surface soils.

D. Manufacturer's certificates of compliance for ACB/mats, revetment cable, geotextile, and any revetment cable fittings and connectors in accordance with the current version of ASTM D 6884, *Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*.

E. Shop Drawings for the layout of the mats, installation, and safety instructions, and any recommendations, if applicable, that are specifically related to the project.

1.4 QUALITY ASSURANCE

1.4.1 General

A. Manufacturer Qualifications:

1. Suppliers must own and operate their own manufacturing facility.
3. A list of five (5) comparable projects, in terms of size and applications, in the United States, where the satisfactory performance of the specific ACB system can be verified after a minimum of five (5) years of service life.
4. The names and contact information (phone numbers and e-mail addresses, at a minimum) for the suppliers' representatives, for technical, production or logistics questions, at least one of whom must reside in the state where the project is located.

B. Installer Qualifications: Minimum 2 year experience installing similar products.

1.5 PRE-INSTALLATION MEETINGS

Supplier's representative shall be available for pre-installation meeting a minimum two weeks prior to starting work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Materials delivered to the site shall be inspected for damage, unloaded and stored with the minimum of handling. Material shall be kept free of dirt and debris.

B. Storage shall be in accordance with manufacturer's requirements.

C. Handling: Materials shall be handled in such a manner as to ensure delivery to the site in sound, undamaged condition.

PART 2 – PRODUCTS

2.1 GEOTEXTILE

Geotextile placed beneath ACB revetment shall be woven geotextile in accordance with Section 31 05 19 GEOSYNTHETICS FOR EARTHWORK.

2.2 ANCHOR SCREWS

Anchors to be used to aid in the support of the concrete revetment on the slope of the shoreline shall be 'Duckbill' or 'Helix' screw anchors or an equivalent anchor approved by the Owner's Representative. Each screw anchor shall possess a minimum pull-out force of 5,000 pounds, as required by the concrete revetment manufacturer.

2.3 ARTICULATED CONCRETE BLOCK

A. Precast Articulated Concrete Revetment shall be Armorflex Model XXX, as manufactured by ARMORTEC, a Contech Company, 9025 Centre Pointe Dr., Suite 400. West Chester, OH 45069. P: 800-645-7000. www.conteches.com/Products/Erosion-Control/Hard-Armor/ArmorFlex.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION

A. All subgrade preparation shall be performed in accordance with the current version of ASTM D 6884, *Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*.

B. The slope shall be graded to a smooth plane surface to ensure that intimate contact is achieved between the slope face and the geotextile (filter fabric), and between the geotextile and the entire bottom surface of the individual ACBs. All slope deformities, roots, grade stakes, and stones which project normal to the local slope face must be re-graded or removed. No holes, "pockmarks", slope board teeth marks, footprints, or other voids greater than 0.5 inch in depth normal to the local slope face shall be permitted. No grooves or depressions greater than 0.5 inches in depth normal to the local slope face with a dimension exceeding 1.0 foot in any direction shall be permitted. Where such areas are evident, they shall be brought to grade by placing compacted homogeneous material. The slope and slope face shall be uniformly compacted, and the depth of layers, homogeneity of soil, and amount of compaction shall be as required by the EOR.

C. Excavation and preparation for all termination trenches or aprons shall be done in accordance to the lines, grades and dimensions shown in the Contract Drawings. The termination trench hinge-point at the top of the slope shall be uniformly graded so that no dips or bumps greater than 0.5 inches over or under the local grade occur. The width of the termination trench hinge-point shall also be graded uniformly to assure intimate contact between all ACBs and the underlying grade at the hinge-point.

D. Immediately prior to placing the filter fabric and ACB mats, the prepared subgrade shall be inspected by the EOR as well as the owner's representative. No fabric or blocks shall be placed thereon until that area has been approved by each of these parties.

3.2 PLACEMENT OF GEOTEXTILE FILTER FABRIC

A. All placement and preparation should be performed in accordance with the current version of ASTM D 6884, *Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*. Filter Fabric, or filtration geotextile, as specified elsewhere, will be placed within the limits of ACBs shown on the Contract Drawings.

B. The filtration geotextile will be placed directly on the prepared area, in intimate contact with the subgrade, and free of folds or wrinkles. The geotextile will not be walked on or disturbed when the result is a loss of intimate contact between the ACB and the geotextile or between the geotextile and the subgrade. The geotextile filter fabric will be placed so that the upstream strip of fabric overlaps the downstream strip. The longitudinal and transverse joints will be overlapped at least one and a half (1.5) feet for dry installations and at least three (3) feet for below-water installations. The geotextile will extend at least one (1) foot beyond the top and bottom revetment termination points, or as required by the EOR. If ACBs are assembled and placed as large mattresses, the top lap edge of the geotextile should not occur in the same location as a space between ACB mats unless the space is concrete filled.

3.3 PLACEMENT OF THE ACBs/MATS

A. ACB placement and preparation should be performed in accordance with the current version of ASTM D 6884, *Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*. ACB block/mats, as specified in Part 2:A of these Specifications, will be constructed within the specified lines and grades shown on the Contract Drawings.

B. Field installation shall be consistent with the way the system was installed in preparation for hydraulic testing pursuant to the current version of ASTM D 7277, *Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow*. Any external restraints, anchors, or other ancillary components (such as synthetic drainage mediums) shall be employed as they were during testing; e.g., if the hydraulic testing installation utilized a drainage layer, then the field installation must also utilize a drainage layer. This does not preclude the use of other section components for other purposes, e.g., a geogrid for strengthening the subgrade for vehicular loading, or an intermediate filter layer of sand to protect very fine-grained native soils.

C. The subgrade shall be prepared in such a manner as to produce a smooth plane surface prior to placement of the ACBs or mats. No individual block within the plane of placed ACBs will protrude more than 0.5 inches or as otherwise specified by the EOR. ACBs should be flush and develop intimate contact with the subgrade section, as approved by the EOR. Proposed hand placing is only to be used in limited areas, specifically identified by the EOR or manufacturers' mat layout drawings, as approved by the EOR.

D. If assembled and placed as large mattresses, the ACB mats will be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying fabric. The mats will be placed side-by-side, so that the mats abut each other, and/or end-to-end. Mat seams or openings between mats greater than two (2) inches will be backfilled with 4000 p.s.i. non-shrink grout, concrete or other material approved by the EOR. Whether placed by hand or in large mattresses, distinct changes in grade that results in a discontinuous revetment surface in the direction of flow will require backfill at the grade change location so as to produce a continuous surface.

E. Termination trenches will be backfilled and compacted flush with the top of the blocks. The integrity of the trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the ACBs for its entire service life. Termination trenches will be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches will be completed in a timely fashion. No more than 500 linear feet of placed ACBs with non-completed termination trenches will be permitted at any time.

F. The cells or openings in the ACBs will be backfilled and compacted with suitable material, as specified by the EOR. Backfilling and compaction will be completed in a timely manner so that no more than 500 feet of exposed mats exist at any time. Finishing requirements are explicitly at the discretion of the EOR.

G. The manufacturer of the ACBs/mats shall provide design and construction advice during the design and initial installation phases of the project when required or as necessary, at the discretion of the EOR. The ACB supplier shall provide, at a minimum, one full day or two half-days of on-site project support upon request

3.4 ANCHOR SCREWS

A. Transverse (short) edges of the mat (8 feet wide) shall extend up the embankment slope. The transverse edge of the mat shall be secured against movement using screw anchors. Three anchor screws shall be secured to polyester cable loops extending from the transverse edge of each mat. Methods for attaching anchor screws to polyester cables of the mat are shown on the Drawings. The manufacturer's installation guide, which includes complete written instructions for the handling, installation and activation of the screw anchor, shall be referenced and followed. One anchor screw shall be installed at the base of the three most upstream mats, near the water's edge, to minimize the potential for uplift from wave action. The final downstream mat shall be installed in an anchor trench excavated parallel to the direction of slope, as shown on the Drawings.

B. The Contractor shall conduct a field test using the screw anchors selected to verify the pull-out force required in this specification. The field test shall be conducted in soil similar to the soil into which the screw anchors are to be installed and using the equipment and procedures selected for installation. The Owner's Representative will be present during the field test.

3.5 PLACEMENT CONTROL

3.5.1 Quality Control Measures

Establish and maintain quality control for all work performed at the project site under this Section to assure compliance with contract requirements. Maintain records of the quality control tests, inspections, and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the placement of all materials to the slope and grade lines shown and in accordance with this Section.

3.5.2 Check Surveys

Surveys made by the Contractor are required on each material placed for determining that the materials are acceptably placed in the work. Make checks as the work progresses to verify lines, grades, and thicknesses established for completed work. At least one check survey shall be made for each 25 foot section as shown as practicable after completion. Following placement of each type of material, the cross section of each step of the work shall be approved by the Owner or their appointed representative before proceeding with the next step of the work. Approval of cross sections based upon check surveys shall not constitute final acceptance of the work. Cross sections shall be taken on lines 25 feet apart, measured along the placement reference line, with readings at 5 foot intervals and at breaks along the lines. However, other cross section spacing and reading intervals may be used if determined appropriate by the Owner or their appointed representative. Additional elevations shall be taken as the Owner or their appointed representative may deem necessary or advisable. The surveys shall be conducted in the presence of the Owner or their appointed representative, unless this requirement is waived by the Owner. The elevation of the stone surface shall be determined by the use of a leveling instrument and a rod having a base 12 inches in diameter. If approved by the Owner or their appointed representative, other means may also be used.

END OF SECTION

Quantity Takeoff - Panther Hollow Lake Dam **Date: October 21, 2019**
Four Mile Run Stormwater Improvement Project - Panther Hollow Lake
PADEP Dam Permit Submission **CEC Project # 174-960**
City of Pittsburgh, Allegheny County, PA

1 Site Preparation and Demolition

	Item	Quantity	Unit	Unit Cost	Total
a	Pond Dewatering Operations	1	LS	$10,000.00	$10,000.00
b	Clearing and Grubbing	0.9	AC	$8,500.00	$7,945.90
c	Existing Tree Removal	10	EA	$2,500.00	$25,000.00
d	Temporary Diversion of Phipps Run and Panther Hollow Run	1	LS	$20,000.00	$20,000.00
e	Existing pedestrian trail removal	2,500	SY	$8.00	$20,000.00
f	Concrete Edge Demolition/Loading/Hauling	1,570	LF	$22.00	$34,540.00
g	Retaining wall removal	130	LF	$20.00	$2,600.00
h	Demo and remove ex. 15" waterline	1,200	LF	$18.00	$21,600.00
i	Demo ex. site lighting	10	EA	$3,000.00	$30,000.00
j	Demo ex. outlet structure and discharge pipe	1	LS	$10,000.00	$10,000.00
k	Relocate ex. utility pole	2	EA	$8,000.00	$16,000.00
l	Demo ex. concrete bypass channel	770	LF	$40.00	$30,800.00
	Item Construction Subtotal				$228,485.90

2 Lake Dredging, Earthwork, Berm Construction

	Item	Quantity	Unit	Unit Cost	Total
a	Dredging to Original Pond Bottom	7,946	CY	$12.00	$95,352.00
b	Lake Shaping Excavation	16,774	CY	$8.00	$134,192.00
c	Import Needed for Lake Shaping Excavation	5,282	CY	$20.00	$105,640.00
d	Embankment Raise (Select Fill)	2,500	CY	$24.00	$60,000.00
e	Cast-in-Place Reinforced Concrete Spillway (2,100 SF x 8" Thick)	53	CY	$600.00	$31,800.00
f	Cast-in-place Reinforced Concrete Cutoff Wall (8' Deep x 25' Wide x 8" Thick)	5	CY	$600.00	$3,000.00
	Item Construction Subtotal				$429,984.00

3 Utility Installation

	Item	Quantity	Unit	Unit Cost	Total
d	CSX Inspection	1	LS	$22,500.00	$22,500.00
e	30" HDPE Pipe Riser Structure	10	LF	$150.00	$1,500.00
f	10" HDPE Pipe	105	LF	$25.00	$2,625.00
g	30" HDPE Pipe	433	LF	$55.00	$23,815.00
j	48" DIA Pre-Cast Manhole	2	EA	$3,500.00	$7,000.00
k	10" Gate Valve	1	EA	$1,100.00	$1,100.00
l	30" X 10" WYE	1	EA	$200.00	$200.00
	Item Construction Subtotal				$58,740.00

Quantity Takeoff - Panther Hollow Lake Dam **Date: October 21, 2019**

Four Mile Run Stormwater Improvement Project - Panther Hollow Lake

PADEP Dam Permit Submission **CEC Project # 174-960**

City of Pittsburgh, Allegheny County, PA

1 Site Preparation and Demolition

4 Landscape Restoration and Site Features

	Item	Quantity	Unit	Unit Cost	Total	
a	Seeding	3.8	AC	$4,000.00	$15,193.76	
b	Treatment Wetland	1	EA	$50,000.00	$50,000.00	
	Item Construction Subtotal				$65,193.76	

5 Erosion & Sedimentation Controls

	Item	Quantity	Unit	Unit Cost	Total	
a	Rock Construction Entrance	2	EA	$ 5,000.00	$10,000.00	
b	18" Compost Filter Sock	600	LF	$ 4.75	$2,850.00	
c	Stabilization Mat	30000	SF	$ 0.30	$9,000.00	
d	Temporary Seeding	6.1	AC	$ 3,000.00	$18,300.00	
e	Permanent Seeding (Vegetation)	6.1	AC	$ 4,000.00	$24,400.00	
f	Filter Bag	2	EA	$ 500.00	$1,000.00	
h	Concrete Wash Out	1	EA	$ 1,000.00	$1,000.00	
	Item Construction Subtotal				$66,550.00	
	Item Construction Subtotal				$848,953.66	
	Mobilization/Demobilization				$55,181.99	
	General Conditions, Site Preparation, Layout and Survey				$25,468.61	
	Contingency (+20% to -10%)				$169,790.73	$84,895.37
	Construction Grand Total				$1,099,395.00	$844,708.90

PITTSBURGH WATER AND SEWER AUTHORITY

PANTHER HOLLOW LAKE
PADEP DAM PERMIT APPLICATION

QUANTITY TAKEOFF JUSTIFICATION
10/21/2019

REVISION RECORD		
NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

PITTSBURGH WATER & SEWER AUTHORITY
CITY OF PITTSBURGH,
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY: CJR
DATE: OCTOBER 2019	DWG SCALE: 1"=30'	PROJECT NO: 174-960

SITE PREPARATION PLAN
PANTHER HOLLOW LAKE REHABILITATION PROJECT

DRAWING NO.: C200

PANTHER HOLLOW LAKE AND FOREBAY POND PLAN

SCALE 1"=30'
0 30 60

DRAFT

PRELIMINARY
NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

CEC
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www.cecinc.com

PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

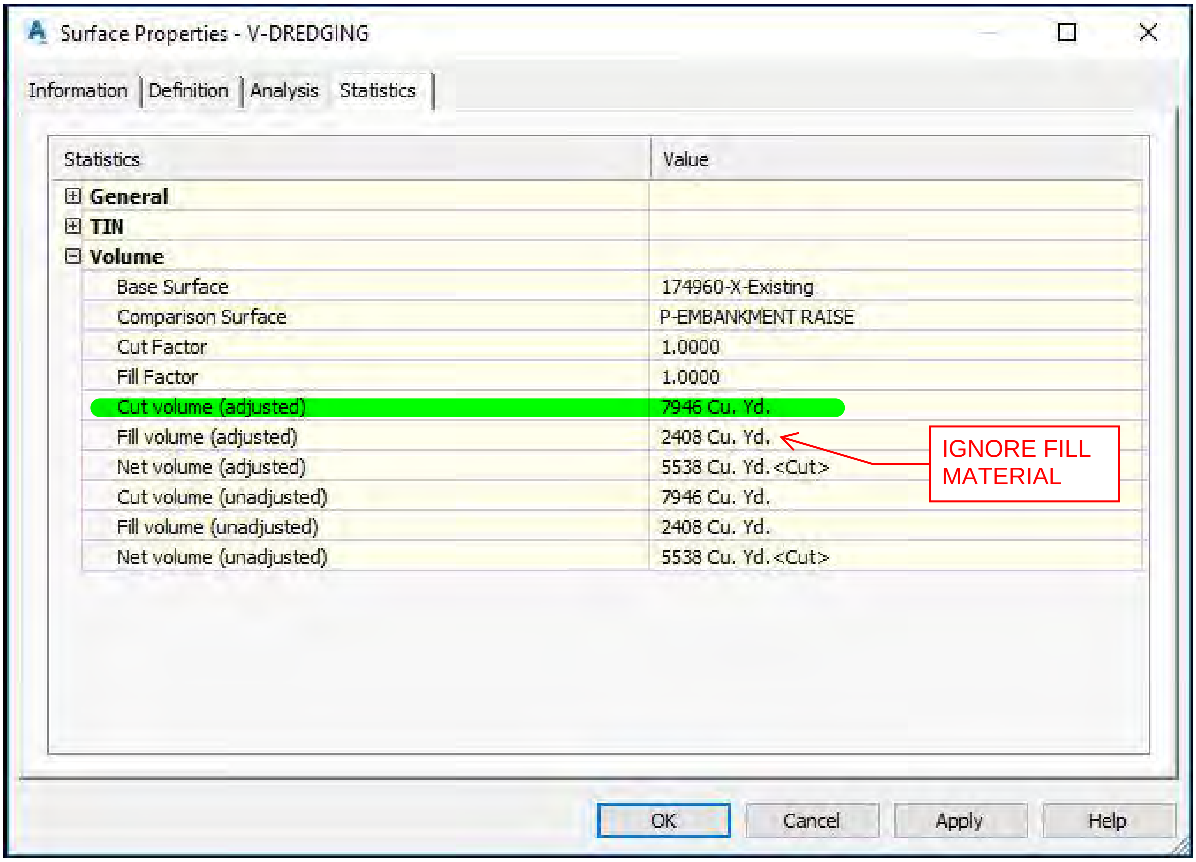
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	CLR	CHECKED BY:	JAL	APPROVED BY:	CJR
DATE:	OCTOBER 2019	DWG SCALE:	1"=30'	PROJECT NO:	174-960

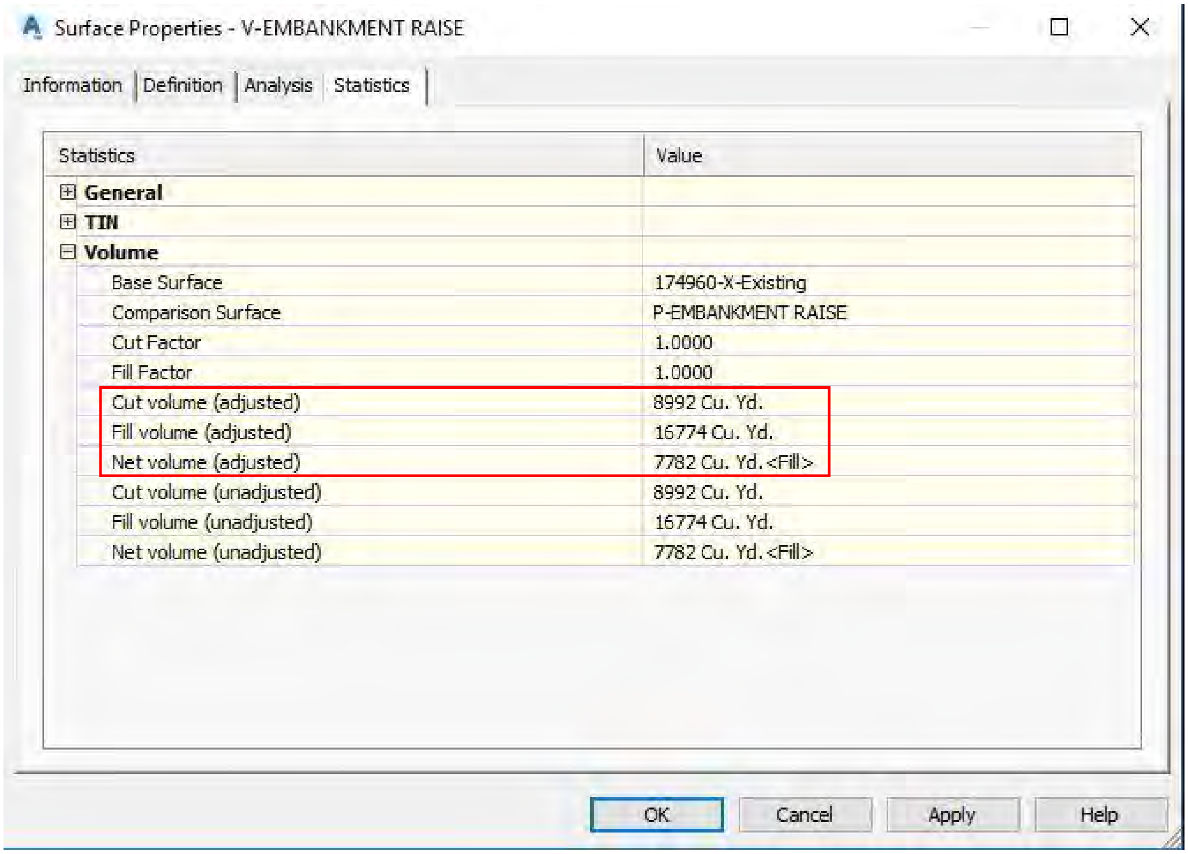
PROPOSED SITE GRADING PLAN
PANTHER HOLLOW LAKE DAM RESTORATION
AND FOREBAY POND

DRAWING NO.:
C300

VOLUME OF DREDGED MATERIAL



VOLUME OF LAKE/EMBANKMENT MATERIAL



Statistics	Value
General	
TIN	
Volume	
Base Surface	174960-X-Existing
Comparison Surface	P-EMBANKMENT RAISE
Cut Factor	1.0000
Fill Factor	1.0000
Cut volume (adjusted)	8992 Cu. Yd.
Fill volume (adjusted)	16774 Cu. Yd.
Net volume (adjusted)	7782 Cu. Yd. <Fill>
Cut volume (unadjusted)	8992 Cu. Yd.
Fill volume (unadjusted)	16774 Cu. Yd.
Net volume (unadjusted)	7782 Cu. Yd. <Fill>

VOLUME ANALYSIS OF REMAINING LAKE EXCAVATION:

V-DREDGE = 7,946 CY
V-REMAINING CUT = 1,046 CY
V-CORE EMBANKMENT = 2,500 CY (SEE NEXT SHEET FOR VOLUME ANALYSIS)
V-TOTAL FILL NEEDED = 16,774 CY

TOTAL IMPORT NEEDED: 16,774 - 7946 - 1046 - 2500 = 5,282 CY

CEC

Civil & Environmental Consultants, Inc.

PROJECT PWSA - 4 Mile Run

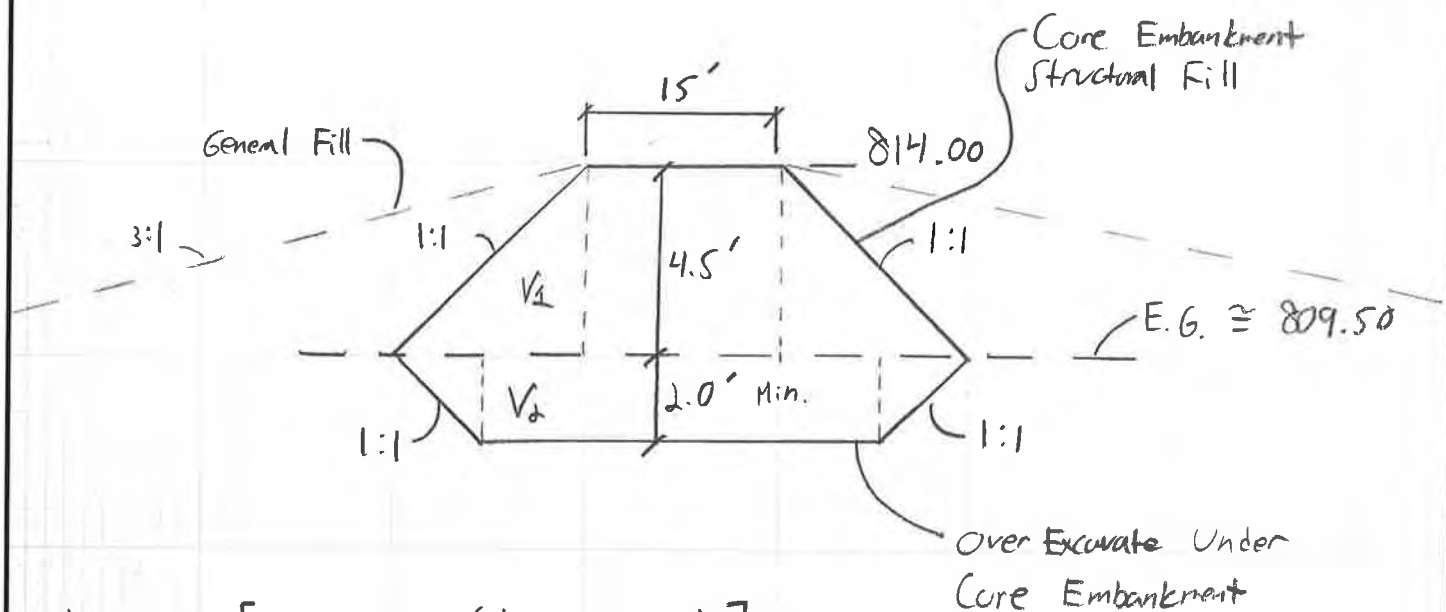
PROJECT NO. 174-960

PAGE 1 OF 1

PREPARED BY JAL DATE 10/20/19 CHECKED BY EJB DATE 10/20/19

Core Embankment : Structural Fill Volume Calculation

510 LF of Embankment



V_1: $510\left[15 \cdot 4.5 + 2\left(\frac{1}{2}\, 4.5 \cdot 4.5\right)\right]$

$V_1 = 44,753$ CF $=$ 1,657 CY

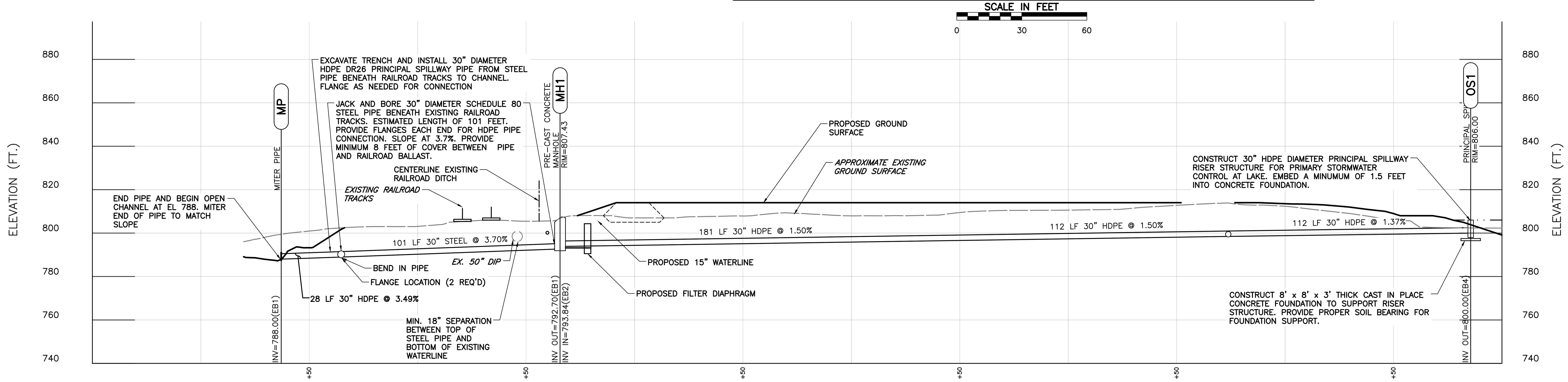
V_2: $510\left[20 \cdot 2 + 2\left(\frac{1}{2}\, 2 \cdot 2\right)\right]$

$V_2 = 22,440$ Cf $=$ 831 CY

Total Core Embankment Volume = 2,488 CY => USE 2,501 CY

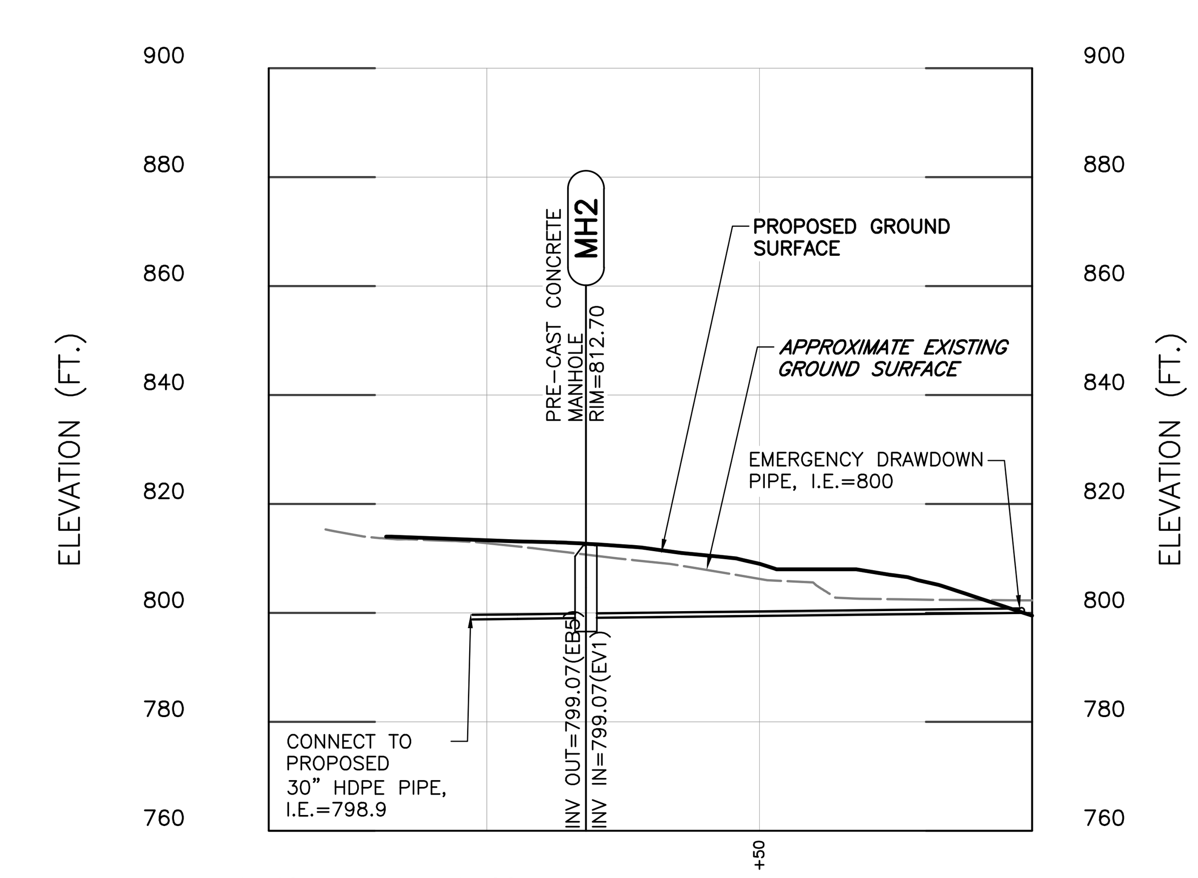
PANTHER HOLLOW LAKE PRINCIPAL AND EMERGENCY SPILLWAY PLAN VIEW

SCALE IN FEET 0 30 60



PANTHER HOLLOW LAKE PRINCIPAL AND EMERGENCY SPILLWAY PROFILE VIEW

SCALE IN FEET 0 30 60



PANTHER HOLLOW LAKE EMERGENCY DRAWDOWN PIPE PROFILE VIEW

SCALE IN FEET 0 30 60

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

REVISION RECORD		
NO	DATE	DESCRIPTION

CEC
Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
Ph: 412.429.2324 · 800.365.2324 · Fax: 412.429.2114
www.cecinc.com

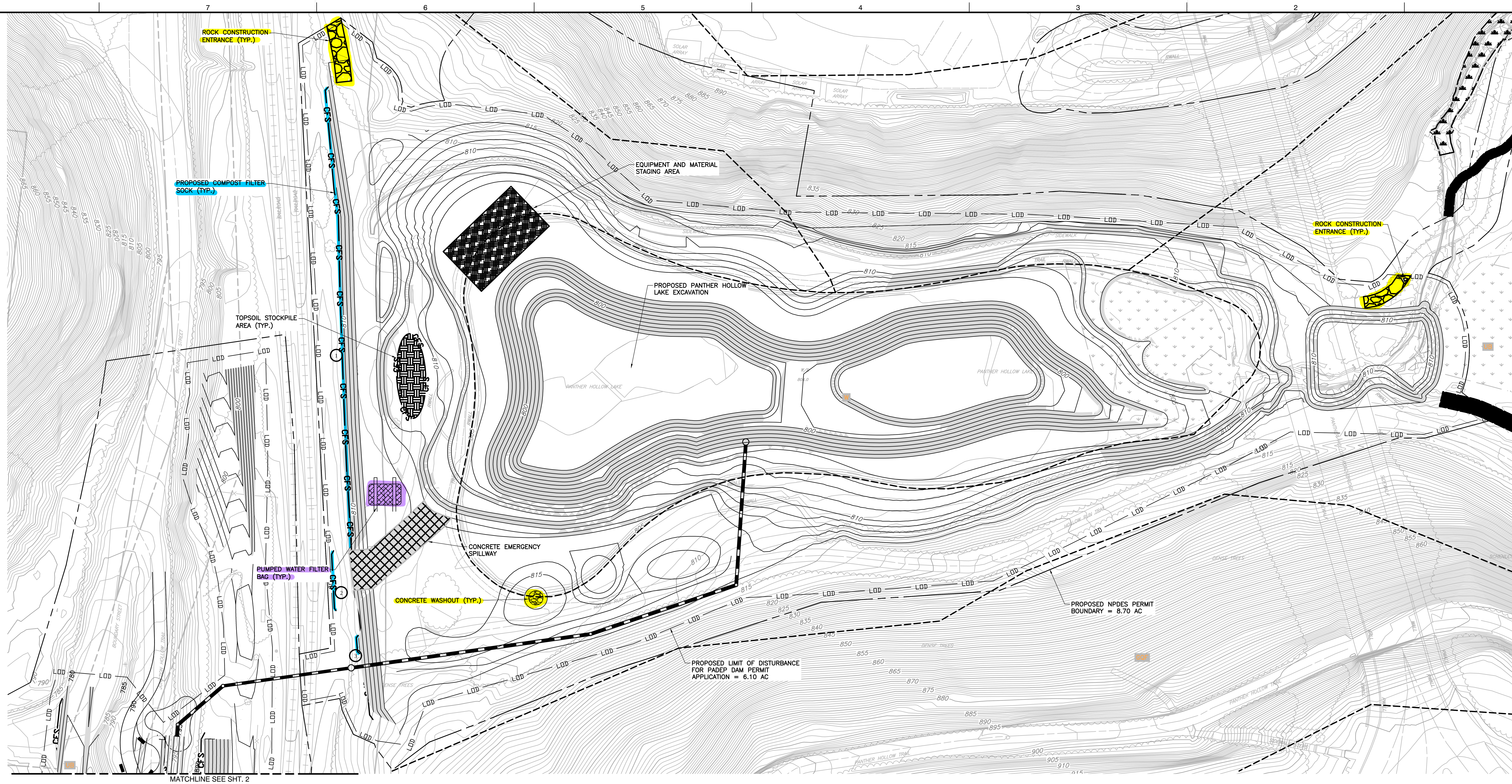
PITTSBURGH PENNSYLVANIA
PGH2O Pittsburgh Water & Sewer Authority

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
PITTSBURGH WATER & SEWER AUTHORITY
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY:	
DATE: OCTOBER 2019	DWG SCALE:	PROJECT NO: 174-960	

PANTHER HOLLOW LAKE PRINCIPAL AND EMERGENCY SPILLWAY PLAN & PROFILE VIEW

DRAWING NO.: C400



LEGEND

1	COMPOST FILTER SOCK NUMBER, REFER TO C5-301 FOR SCHEDULE		DUST COVERS		EROSION CONTROL BLANKET
CFS	COMPOST FILTER SOCK	IFM	INLET FILTER MAT		ROCK CONSTRUCTION ENTRANCE
LOD	LIMIT OF DISTURBANCE		CONCRETE WASHOUT		MATERIAL AND EQUIPMENT STAGING AREA
	ROCK CONSTRUCTION ENTRANCE		PUMPED WATER FILTER BAG		SOIL STOCKPILE AREA
	SOIL DELINEATION	GQF	SOIL TYPE		

811

Pennsylvania One Call System, Inc.
Call 3 Business Days Before You Dig!
1-800-242-1776 or 8-1-1
POCS Serial NO. :_______________
Date:_______________

PENNSYLVANIA ONE CALL SYSTEM, INC. 1-800-242-1776 STOP! - CALL BEFORE YOU DIG!

CONTRACTORS ARE REQUIRED TO NOTIFY THE FACILITY OWNERS NOT LESS THAN THREE (3) NOT MORE THAN TEN (10) WORKING DAYS PRIOR TO EXCAVATION OR DEMOLITION WORK WHEN USING POWERED EQUIPMENT ON PUBLIC OR PRIVATE PROPERTY ANYWHERE IN THE COMMONWEALTH. CONTRACTORS ARE RESPONSIBLE FOR PRESERVING THE FACILITY OWNER MARKINGS, TO EXERCISE DUE CARE AND EMPLOY PRUDENT TECHNIQUES WITHIN THE TOLERANCE ZONE. CONTRACTORS SHOULD KEEP EACH OPERATOR AT THE SITE INFORMED AND EVALUATE THE PREMISES IF NECESSARY. NOTIFICATION SHOULD BE MADE THROUGH THE PENNSYLVANIA ONE-CALL SYSTEM (1-800-242-1776 or 8-1-1).

SYMBOL	SOIL TYPE
URB	URBAN LAND-RAINSBORO COMPLEX, GENTLY SLOPING, HYDROLOGIC SOIL GROUP C
UB	URBAN LAND
GQF	GILPIN-UPSHUR COMPLEX, VERY STEEP, HYDROLOGIC SOIL GROUP C

OFF-SITE RECEIVING WATERS OF THE COMMONWEALTH

UNT TO MONONGAHELA RIVER ID: 134839843 - WARM WATER FISHES (WWF)

WATERSHED: LOWER MONONGAHELA

REFERENCE: PA eMap

SOCK NO.	DIAMETER (IN.)	SLOPE (%)	SLOPE LENGTH ABOVE BARRIER (FT.)
1	18	33	12
2	18	7	93
3	18	33	12

REFERENCE: PADEP E&S MANUAL STANDARD E&S WORKSHEET NO. 1

40' 0' 40' 80'
SCALE: 1" = 40'

REVISION RECORD

NO	DATE	DESCRIPTION

SciTek CONSULTANTS, INC.
1880 JOHN F. KENNEDY BLVD., SUITE 600
PHILADELPHIA, PA 19103
PHONE: (267) 341-5385 FAX: (267)519-0273
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4MR

PGH2O Pittsburgh Water & Sewer Authority

PITTSBURGH WATER & SEWER AUTHORITY
FOUR MILE RUN
STORMWATER IMPROVEMENT PROJECT
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	LJK/KPK	CHECKED BY:	KPK	APPROVED BY:	KPK
DATE:	OCTOBER 2019	DWG SCALE:	AS-SHOWN	PROJECT NO:	18-840

EROSION AND SEDIMENT CONTROL PLAN

FIGURE NO.: C900

PANTHER HOLLOW LAKE SITE PHOTOGRAPH LOCATION MAP

SCALE IN FEET

0 30 60

LEGEND

SITE PHOTOGRAPH LOCATION AND DIRECTION

DRAFT

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REVISION RECORD		
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PITTSBURGH WATER & SEWER AUTHORITY
FOUR MILE RUN
STORMWATER IMPROVEMENT PROJECT
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY:	CLR	CHECKED BY:	JAL	APPROVED BY:	
DATE:	OCTOBER 2019	DWG SCALE:	AS-SHOWN	PROJECT NO:	174-960

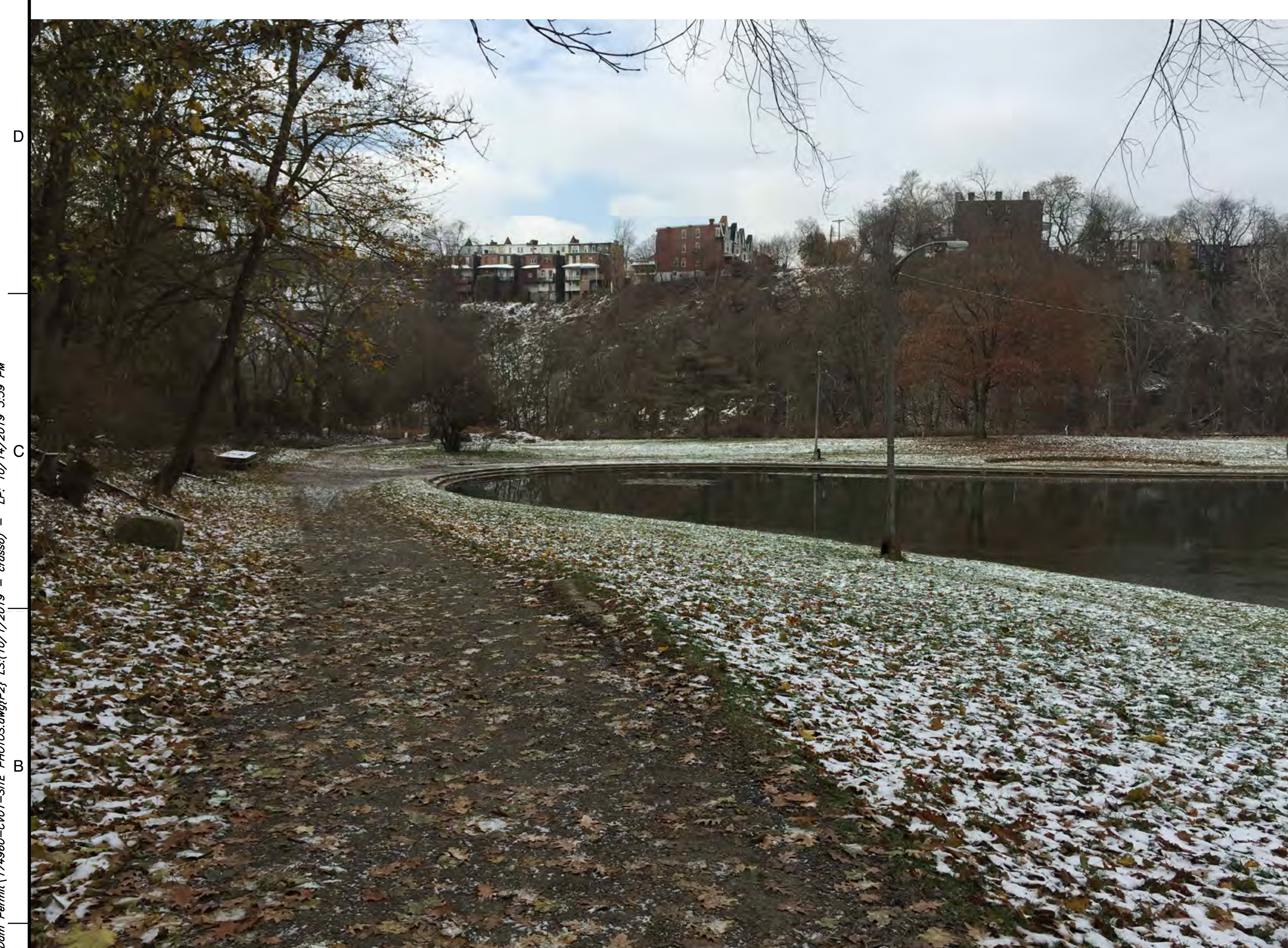
SITE PHOTOGRAPHS
PANTHER HOLLOW LAKE DAM RESTORATION
AND FOREBAY POND

DRAWING NO.:
P1

SITE PHOTOGRAPH 1
DATE TAKEN: 11-29-18

SITE PHOTOGRAPH 2
DATE TAKEN: 05-16-18

SITE PHOTOGRAPH 3
DATE TAKEN: 11-29-18



SITE PHOTOGRAPH 4
DATE TAKEN: 11-29-18

SITE PHOTOGRAPH 5
DATE TAKEN: 11-29-18

DRAFT

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NOT FOR CONSTRUCTION

REVISION RECORD

NO	DATE	DESCRIPTION

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PITTSBURGH WATER & SEWER AUTHORITY
FOUR MILE RUN
STORMWATER IMPROVEMENT PROJECT
PITTSBURGH, ALLEGHENY COUNTY, PA

DRAWN BY: CLR	CHECKED BY: JAL	APPROVED BY:
DATE: OCTOBER 2019	DWG SCALE: AS-SHOWN	PROJECT NO: 174-960

SITE PHOTOGRAPHS
PANTHER HOLLOW LAKE DAM RESTORATION
AND FOREBAY POND

DRAWING NO.: P2

Preliminary Construction Schedule **Date: October 21, 2019**

Four Mile Run Stormwater Improvement Project - Panther Hollow Lake PADEP Dam Permit Submission

CEC Project # 174-960

City of Pittsburgh, Allegheny County, PA

Task	Anticipated Start Date	Anticipated Completion Date
Notice to Proceed	September 1, 2020	September 1, 2020
Mobilization	September 7, 2020	September 11, 2020
Install Construction Access Route to Panther Hollow Lake	September 11, 2020	September 18, 2020
Erosion Control Installation	September 18, 2020	September 30, 2020
Diversion of Phipps Run and Panther Hollow Run	September 30, 2020	October 9, 2020
Lake Drawdown/Dewatering	October 9, 2020	October 23, 2020
Demolition	October 23, 2020	November 13, 2020
Clearing & Grubbing/Tree Removal	November 13, 2020	November 27, 2020
Relocate Existing 15-inch Waterline	November 27, 2020	December 11, 2020
Lake Dredging	December 11, 2020	December 31, 2020
Principal Spillway and Emergency Drawdown Pipe Installation	December 31, 2020	January 15, 2021
Excavation and Grading of Proposed Lake and Forbay	January 15, 2021	February 26, 2021
Emergency Spillway Construction	February 26, 2021	March 12, 2021
Surface Feature Construction (Trails, Lighting, Paths, etc.)	March 12, 2021	March 31, 2021
Wetland Establishment	March 31, 2021	April 30, 2021
Stabilization Measures (Seeding, Erosion Control Mat, etc.)	March 31, 2021	April 30, 2021
*Divert Phipps Run and Panther Hollow Run to Panther Hollow Lake	April 30, 2021	May 7, 2021
Removal of Erosion Control Measures	May 7, 2021	May 14, 2021
Demobilization	May 17, 2021	May 20, 2021
Project Completion	May 21, 2021	May 21, 2021

*Diversion of Phipps Run and Panther Hollow Run can occur only after all downstream conveyance faciliaties have been constructed and inspected to be fully functioning. This also assumes the permitting and approval of the JPA is concurrent with the Dam Saftey Permit

APPENDIX G

ENVIRONMENTAL ASSESSMENT (SECTION 7.3)

PITTSBURGH
PENNSYLVANIA

Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

ENVIRONMENTAL ASSESSMENT

Prepared For:

The City of Pittsburgh, Department of Public Works
Parks Maintenance Division
and
Pittsburgh Water and Sewer Authority

Prepared By:

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

Permit

ENVIRONMENTAL ASSESSMENT

The City of Pittsburgh, Department of Public Works and Pittsburgh Water and Sewer Authority

Panther Hollow Lake Rehabilitation Project

Allegheny County, Schenley Park, Pittsburgh Pennsylvania

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

MODULE S1: PROJECT SUMMARY

S1.A OVERALL PROJECT DESCRIPTION

The Pittsburgh Water and Sewer Authority (PWSA) is directing the Panther Hollow Lake Rehabilitation Project (Project) in order to remove sediment and dissipate direct stream inflows from the combined sewer system (CSS) and to comply with the Pennsylvania Department of Environmental Protection's (PADEP) dam safety regulations. The Project will implement green stormwater infrastructure as part of the Four Mile Run Stormwater Improvement Project within the Green First Plan, which will reduce burden on the CSS in the Four Mile Run watershed (M-29 sewershed) and the resulting combined sewage overflows (CSO) into the Monongahela River.

The Project is located within approximately 320 acres of Schenley Park in the City of Pittsburgh, Allegheny County, Pennsylvania (Figure 1). Schenley Park is generally forested with some open fields and contains common invasive species. The neighborhoods around the Project area are Oakland, Squirrel Hill, and Greenfield. Panther Hollow Run and Phipps Run are the main streams flowing through Schenley Park. The Project area covers approximately 150 acres; however, the drainage area extends well beyond the site limits and covers approximately 2,300 acres. The property is heavily used for public recreational purposes, and development within and adjacent to the project area consists of an extensive trail network, picnic shelters and pavilions, the Schenley Park Visitor Center, playgrounds, The Schenley Swimming Pool, The Schenley Oval Sportsplex, various sports fields, The Shenley Park Ice Skating Rink, The Bob O'Connor Golf Course, Phipps Conservatory and Botanical Gardens, universities, and urban neighborhoods.

An Erosion and Sedimentation (E&S) Control Plan, a National Pollutant Discharge Elimination System (NPDES) Permit for stormwater discharges associated with construction activites, a Post Construction Stormwater Management (PCSM) Plan, a Water Drawdown Application, and a Stormwater Protection Plan (SWPP) are being submitted with this application. The construction activities for the Project are within the waters delineation boundary for the area around Panther Hollow Lake (Appendix B).

S1.B PROJECT PURPOSE, NEED, WATER DEPENDENCY, AND IMPACT SUMMARY

S1.B (1) Project Purpose

PWSA is seeking to implement several green infrastructure and stormwater management projects across its operating area, as part of the 2016 Citywide Green First Plan to address CSO issues. PWSA has prioritized the Four Mile Run watershed (M-29 sewershed) in Schenley Park for an implementation project, due to this area being one of Pittsburgh's largest CSO contributors to the Monongahela River. The purpose of the Project is to restore and upgrade Panther Hollow Lake in order to reduce stormwater and sediment transport and manage direct stream inflow to the existing CSS, located in Junction Hollow.

The Project intends to stabilize and enhance segments of the lower reaches of Panther Hollow Run and Phipps Run, create a forebay and a pretreatment wetland, dredge and expand the lake, remove concrete edging to add naturalized edging, improve embankments, and create enhanced recreational access. The Project will meet dam compliance by raising the embankment, moving the primary spillway pipe, and creating an emergency spillway. The anticipated construction area will be located within Schenley Park.

S1.B (2) Project Need

The need for this project is to meet regulatory criteria under Title 25 of the Pennsylvania Code, Chapter 105, Subchapter B Dams and Reservoirs and to support other PWSA projects in the M-29 sewershed in order to obtain compliance under state and federal water quality laws and regulations to reduce and eliminate sewage contamination from local rivers and streams. The Project will retain flow and catch sediment from abutting streams and slow flash flooding during large storm events, to protect nearby public corridors from flooding and to reduce or eliminate CSO to the Monongahela River.

Most of the tributaries in Schenley Park have high, unstable stream banks with sparse vegetation and are surrounded by upslope impervious areas, which results in heavy bank erosion and high sediment loads being transported by the streams. During flash flooding events, sediment and debris can be transported to Panther Hollow Lake, which causes excessive sediment accumulation in the lake bed and possible entry into the pipe inflow, clogging various components of the CSS. The Project plans to slow stormwater flow and reduce the transport of sediment and debris before it enters the CSS.

S1.B (3) Water Dependency Statement

Due to the M-29 sewershed being one of Pittsburgh's largest CSO contributors to the Monongahela River, extreme stormwater flow and heavy sediment transport from the Four Mile Run area is being addressed. Panther Hollow Run, Phipps Run, and their unnamed tributaries, in Schenley Park, flow into Panther Hollow Lake, which contains an intake valve that enters the CSS. Downstream of the inflow point, the existing sewer system consists of the captured and culverted Four Mile Run, which currently flows within a pipe under Junction Hollow and multiple City streets to the Monongahela River. The Project must impact aquatic resources to fulfill its basic purpose of slowing stormwater flow and reducing sediment transport. The stream and lake banks within the project area will be stabilized; proper vegetation will be planted in the riparian areas and wetland; and pipes, spillway, and forebay areas will be reconfigured. The Project cannot serve its intended purpose without impacting aquatic resources.

S1.B (4) Summary of Resources Present

Ecologists from Civil & Environmental Consultants, Inc., (CEC) identified and delineated water resources within Schenley Park during site visits on October 3, 6, and 17, 2017 and October 31, 2018. Wetlands were delineated in accordance with the U.S. Army Corps of Engineers (USACE) 1987 *Corps of Engineers Wetlands Delineation Manual,* supplemented by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0),* 2012. Streams were identified and classified by the presence of defined bed and banks, ordinary high water marks, stream flow, substrate characteristics, and the presence or absence of benthic macroinvertebrates and fish. The Project area is within the delineated boundary; however, the Project area is significantly smaller than the total study boundary and limited to adjoining areas to Panther Hollow Lake.

CEC identified two Palustrine Emergent (PEM) wetlands, totaling 0.57 acres; one Palustrine Scrub-Shrub (PSS) wetland, totaling 0.05 acres; one open water area, totaling 2.09 acres; and two perennial streams, totaling 617 linear feet. The wetlands were hydrologically sourced by seeps and groundwater discharge from adjacent water resources and runoff. The Wetland and Stream Delineation Report is enclosed in Appendix A. Table 1 lists the unique resource identifier of each aquatic resource and details type, size, fishery designations, Chapter 93 designated or existing use, and whether any of the wetlands would be considered exceptional value.

Table 1. Summary of Aquatic Resources

Unique Resource Identifier	Resource Type	Stream Channel Length (ft)	Floodway or Wetland Acreage	Fishery Designation[1]	Designated Use[2]	Existing Use[3]	Exceptional Value Wetland
Phipps Run (Stream 22)	Watercourse	189	N/A	None	WWF	None	N/A
Panther Hollow Run (Stream 10)	Watercourse	428	N/A	None	WWF	None	N/A
Panther Hollow Lake	Open Water	N/A	2.088	N/A	N/A	N/A	N/A
Wetland 7	Wetland	N/A	0.292	N/A	N/A	N/A	No
Wetland 8			0.270				
Wetland 8			0.050				

1. "Fishery Designation" refers to streams listed by the Pennsylvania Fish and Boat Commission as stocked waters or wild trout; 2. WWF = Warm Water Fishes; 3. "None" means that a separate use is not listed for this stream or its receiving waters on the PADEP Existing Use list.

S1.B (5) Proposed Impacts

The proposed project will include temporary direct impacts to Panther Hollow Lake, Panther Hollow Run, Phipps Run, and Wetland 7. Impacts to stream segments and their floodplains are associated with bed and bank dredging, rerouting, stabilization, and restoration, in order to create a forebay upstream of and a treatment wetland abutting Panther Hollow Lake. The proposed stream segments, floodplains, forebay, and treatment wetland will be designed to collect and detain excess stormwater and filter sediment from the water column. Native woody vegetation is to be planted in a 50- to 100-foot buffer around the streams. The nearby existing wetland (Wetland 8) will not be impacted. All proposed impacts are designed to improve the condition and function of the onsite streams and wetlands by decreasing erosive floodwaters and improving flood attenuation of the features themselves. Table 2 provides a summary of the type and size of each impact. Refer to Figure 2 for the Aquatic Resources Map and the EC00 series of drawings for plan views and profiles of each proposed impact. The overall site plan displays watercourses present near the project and their assumed floodways or calculated 100-year floodplains.

Table 2. Summary of Impacts to Aquatic Resources by the Project

Unique Resource Identifier[1]	Resource Condition	Permit Type	Permanent Direct Impacts	Temporary Direct Impacts	Permanent Indirect Impacts	Temporary Indirect Impacts
Panther Hollow Run	Riverine	Dam Safety	0 feet	40 feet	0.00	0.00
Phipps Run	Riverine	Dam Safety	0 feet	167 feet	0.00	0.00
Panther Hollow Lake	Open Water	Dam Safety	0 acres	0.02	0.00	0.00
Wetland 7	Wetland	Dam Safety	0 acres	0.05	0.00	0.00

MODULE S2: RESOURCE IDENTIFICATION AND CHARACTERIZATION

S2.A RESOURCE IDENTIFICATION INFORMATION

S2.A (1) Resource Identification Map

The proposed project is located within Schenley Park in the City of Pittsburgh. The Environmental Assessment Form's listed items (ii) through (viii) are not located within the project limits of disturbance. Additionally, items (vii) and (viii) are not located within 100 feet of the project limits. Refer to Figure 2 for the Aquatic Resource Map.

S2.A (2) Wetland Delineation and Watercourse Identification Report

The wetland and stream delineations for the project were conducted during October of 2017 and 2018. A copy of the report is included in Appendix A of this report.

S2.A (3) Professional Qualifications

Kate Gaglio and Kyle Filicky (CEC Ecologists) led the wetland and stream delineation fieldwork. Kate Gaglio completed the wetland and stream delineation report. For questions or information regarding the fieldwork or report, please contact:

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Pittsburgh, PA 15205
(412) 275-2996
tnuttle@cecinc.com

S2.B SUMMARY OF RESOURCES PRESENT

Two (2) streams and two (2) wetlands were identified within the Project boundary. Table 1 lists the unique resource identifier of each resource within the Project boundary. The table also lists the resource type, size, fishery designations, Chapter 93 designated or existing use, and whether any of the wetlands would be considered exceptional value.

S2.C FEDERAL AND STATE THREATENED AND ENDANGERED SPECIES HABITAT

On October 4, 2019, a Pennsylvania Natural Diversity Inventory (PNDI) screening returned a notice stating that the records for the PA Fish and Boat Commission (PAFBC) and the U.S. Fish and Wildlife Service (USFWS) indicated no known impacts to threatened or endangered species and/or special concern species and resources within the Project area. The PNDI results for the PA Game Commission (PAGC) stated that conservation measures may be needed based on the decision from the USFWS. The USFWS had determined that no impact was anticipated; therefore, no conservation measures are required. The PNDI results for the PA Department of Conservation and Natural Resources (PADCNR) stated that the Project may have a potential impact to a species of special concern, the Common Hop-tree (*Ptelea trifoliate*) and that further review was required. CEC conducted surveys for the listed species and is currently coordinating with PADCNR to establish conservation and avoidance measures to resolve the potential impacts. CEC will forward the results for PADEP review. The PNDI information and correspondence is located in Appendix B.

S2.D RESOURCE CHARACTERIZATION

S2.D (1) Riverine Resources

Both of the streams identified in the Project study area would be considered headwaters with moderate to high gradients within the Project boundaries (Table 3). During the assessment, the streams had forested buffers with evidence of bank erosion and adjacent recreational-use walking trails.

S2.D (1)(a) Summary of Rapid Assessment Protocol Results

A Riverine Level 2 Rapid Assessment was completed for the streams that are proposed to be impacted by the Project: Panther Hollow Run (Stream 10) and Phipps Run (Stream 22).

Panther Hollow Run: The Assessment Area (AA) for Panther Hollow Run (Stream 10) begins at the confluence with Panther Hollow Lake and Wetland 7 and extends 833 feet upstream. The park trails, bridge crossing, riprap bank stabilization, and overflow structure were taken into account when assigning a low minor score for the Channel Alteration Condition Index. The stream was assigned a marginal score for Instream Habitat Index due to the abundance of cobble, gravel, and fines that limit fish habitat. The stream received a marginal score for the Channel/Floodplain Index due to considerable erosion along both banks within the Assessment Area.

The Riparian Vegetation Areas for each impacted stream was established based on the 100-year floodplain elevation generated by CEC using HEC-RAS. The Riparian Zone of Influence (ZOI) for each impacted stream was established as a 100-foot buffer offset from the Riparian Vegetation area. Both the Riparian Vegetation and Riparian ZOI Condition indices for Panther Hollow Run were rated in the optimal range. Mature trees were present and provided adequate canopy coverage, wetlands were present at the confluences with Phipps Run and Panther Hollow Lake, and the stream channel outflows to Panther Hollow Lake.

The total Riverine Condition Index Score (RCI) can range from 0.05 to 1.00. Panther Hollow Run received an RCI score of 0.60.

Phipps Run: The Assessment Area (AA) for Phipps Run (Stream 22) begins at the confluence with Panther Hollow Run and Wetland 8 and extends 617 feet upstream. The park trails, bridge crossings, channelization, bank stabilization, and overflow outlet were taken into account when assigning a severe score for the Channel Alteration Condition Index. The stream was assigned a poor score for Instream Habitat Index due to the abundance of gravel and fines and habitat limits to epifaunal and fish communities. The stream received a poor score for the Channel/Floodplain Index due to considerable channelization along both banks and disconnection from the natural floodplain within the Assessment Area.

The Riparian Vegetation Areas for each impacted stream was established based on the 100-year floodplain elevation generated by CEC using HEC-RAS. The Riparian Zone of Influence (ZOI) for each impacted stream was established as a 100-foot buffer offset from the Riparian Vegetation area. Both the Riparian Vegetation and Riparian ZOI Condition indices for Phipps Run were rated in the optimal range. Mature trees were present and provided adequate canopy coverage, a wetland was present at the confluence with Panther Hollow Run, and the stream channel abuts the manmade Panther Hollow Lake.

The total Riverine Condition Index Score (RCI) can range from 0.05 to 1.00. Phipps Run received an RCI score of 0.38. A copy of the Riverine Assessment Form can be found in Appendix C of this report. Refer to Figures 4A-B for maps of each stream's Assessment Area and Riparian ZOI.

Table 3. Characterization of Riverine Resources

Unique Resource Identifier	Slope Category[1]	Watershed Size[2]	Level 2 RAP Score
Stream 10	2	1	0.60
Stream 22	3	1	0.38

1. 1 = Low gradient 2 = Moderate gradient, 3 = High gradient
2. 1 = Headwaters.

S2.D (1)(b) Hydrologic

The streams within the project area are highly altered hydrologically. They have small drainage areas, and the surrounding areas upslope are heavily developed. All of the streams are partially disconnected from their upper watersheds because the street network intercepts stormwater and prevents infiltration and groundwater recharge. The amount of impervious surface, steep slopes, and lack of understory vegetation in the upstream properties has led to storm surges with substantial erosive forces. The storm flows have scoured slope and stream banks, introducing large amounts of sediment into each stream. In addition, a sparse understory provides poor stormwater retention, groundwater recharge, and increases runoff velocities. It is likely that these streams do provide some control for storm surges and sediment retention; however, these functions are low.

S2.D (1)(c) Biogeochemical

The drainage areas of the streams onsite are constricted by surrounding development and have moderate to high gradient. The 100-year floodplain of these streams is very narrow, and in some cases may not even exceed the width of the stream channel itself. As a result, the nutrient processing and sediment control functions that the natural floodplain provides are likely limited. While the current streams and floodplains may provide low to moderate retention of nutrients and sediments, the large quantities of sediment, road salt, and pollutants typically encountered in urban settings, likely overloads the biogeochemical functions of the soil to process these nutrients and chemicals.

S2.D (1)(d) Habitat Attributes

Riparian areas include some mature trees and understory vegetation. Instream habitat is lacking in many of the streams, given their substrate embeddedness. The streams have perennial flow, which provides suitable habitat for benthic macroinvertebrates and amphibians, but lack habitat suitable for fish. The streams are completely disconnected from downstream waters because the flow ultimately enters the CSS from Panther Hollow Lake; this prevents colonization of the stream by fish and other species. Channelization and culverts on connecting tributaries also limits habitat for all aquatic life in those areas.

S2.D (1)(e) Recreational Uses

The streams onsite do not provide any known recreational uses. Both of the streams in the Project area are too small to provide boating or fishing opportunities.

S2.D (1)(f) Upstream and Downstream Riparian Properties

Both streams onsite have small drainage areas, and the neighborhoods upslope are heavily developed. The extent of impervious surface, steep slopes, and sparse understory vegetation in the upstream properties have led to storm surges with substantial erosive forces. The storm flows have scoured slopes and stream banks, introducing large amounts of sediment into the streams.

The downstream properties are likely affected by the lack of sediment retention and filtration by the current stream conditions. The existing aquatic resources cannot manage stormwater during storm surge events, except to drain them directly to Panther Hollow Lake. The capacity of the lake is chronically exceeded, and it frequently floods the surrounding trails and overburdens the CSS, which ultimately contributes to sewage overflow into the Monongahela River, creating a public safety and welfare issue. Excess sedimentation into the CSS lowers system capacity, worsening CSOs and increasing risk of blockages and sewage backups.

S2.D (2) Wetland Resources

Wetlands were classified as Riverine Headwater Complex and Lacustrine Artificially Flooded wetlands with Mixed Forb Wet Meadow and Black Willow Floodplain Thicket plant communities. Two wetlands identified onsite were classified as Palustrine Emergent wetlands, one wetland was classified as Palustrine Scrub-Shrub, and one open water area (Panther Hollow Lake) was classified as Palustrine Open Water.

Panther Hollow Lake was manmade in 1908 for recreational use, mainly boating, and it is presently maintained by the Pittsburgh Parks Conservancy for public recreational use, including fishing and nature observation. The riparian shoreline consists of maintained lawn, trails, and Wetland 7 at the eastern edge. The lake has depths ranging between 3 and 5 feet due to extreme sedimentation and lack of dredging maintenance over decades, with sparse aquatic plants and limited habitat for fish, amphibians, and aquatic invertebrates.

The Level 2 Rapid Assessment Protocol was completed for Wetland 7 and the lake, refer to Table 4 for classifications of each wetland.

Table 4. Characterization of Wetland Resources

Unique Resource Identifier	HGM Classification[1]	Cowardin Classification[2]	Palustrine Community Classification	Level 2 RAP Score
Wetland 7	R3c	PEM	Mixed Forb – Graminoid Wet Meadow	0.67
Wetland 8	R3c	PEM	Mixed Forb – Graminoid Wet Meadow	N/A
Wetland 8	R3c	PSS	Black Willow Floodplain Thicket	N/A
Panther Hollow Lake	Dph	POW	N/A	0.47

1. R3c = Riverine Headwater Complex, LFK = Lacustrine artificially flooded.
2. PEM = Palustrine Emergent, PSS = Palustrine Scrub-Shrub, POW = Palustrine Open Water

S2.D (2)(a) Hydrologic

Wetlands located onsite provide moderate flood and stormwater control and groundwater recharge functions because of their location adjacent to and abutting the streams and lake and downslope of developed impervious areas, which contribute stormwater runoff. However, retention and recharge is likely limited because the wetlands are dominated by herbaceous vegetation (which provides less retention and recharge than woody vegetation). Wetland 8 is at a higher elevation in the floodplain and has continuous outlets to the streams, which means it is periodically flushed during storm events.

S2.D (2)(b) Biogeochemical

Biogeochemical functions provided by the wetlands onsite are limited for similar reasons listed above. Wetland 7 provides sedimentation control at the confluence of Panther Hollow Run and Panther Hollow Lake. Wetland 8 provides little sedimentation control for the abutting streams due to its high elevation in the floodplain. The wetlands have low contribution to nutrient and pollutant processing due to their small sizes and dominant herbaceous vegetation. Retention periods for pollutants to be processed are also limited, since the wetlands have continuous outlets or are periodically flushed by flooding from abutting streams.

S2.D (2)(c) Habitat Attributes

Wetland 7 has dominant herbaceous plants with flowers, edible seeds, fruit, tubers, etc., and sufficient hydroperiods and water depth that support a high to moderate rating of feeding, breeding, and cover for aquatic invertebrates, amphibians, and/or waterfowl. Wetland 8 has a high to moderate rating for habitat functions due to vegetative diversity and interspersion of shrubs and herbaceous plants and seasonal to semi-permanent hydroperiods, lacking aquatic habitat.

S2.D (2)(d) Recreational Uses

Wetlands 7 and 8 provide limited recreational use for nature observation due to their small sizes and inadequate access.

S2.D (3) <u>Lacustrine Resources</u>

No lacustrine resources were identified onsite.

MODULE S3: IDENTIFICATION AND DESCRIPTION OF POTENTIAL PROJECT IMPACTS

S3.A PROPOSED IMPACTS

The Project will include temporary and permanent direct impacts to aquatic resources. Near the proposed forebay and treatment wetland, upstream of Panther Hollow Lake, existing stream segments and their floodplains will be restored and enhanced. The proposed stream channels will be designed to complement the forebay and wetland by collecting and detaining excess stormwater and filtering sediment from the water column. Native woody vegetation will be planted in a 50- to 100-foot buffer around the streams. The existing wetland at the confluence of the streams will not be impacted. All proposed impacts are likely to improve the condition and function of the onsite streams by decreasing erosive floodwaters and improving flood attenuation of the features themselves. See Table 2 in Section S1.B(5) for the summary table of proposed direct and indirect impacts for each resource category.

S3.B STANDARD INFORMATION RESPONSES

The Project is within Schenley Park, a local public park in the City of Pittsburgh. The property is heavily used for public recreational purposes, and development within the property consists of an extensive trail network, picnic shelters and pavilions, the Schenley Park Visitor Center, playgrounds, The Schenley Swimming Pool, The Schenley Oval Sportsplex, various sports fields, The Shenley Park Ice Skating Rink, The Bob O'Connor Golf Course, and Phipps Conservatory and Botanical Gardens. The Project intends to increase the storage capacity of Panther Hollow Lake construct and/or improve detention and retention structures to store and/or delay the flow of stormwater, and reduce sediment transport into the CSS downstream of the project area. The Project will likely temporarily impact park usage during construction; however, once the project is complete the visitor experience should be enhanced by the upgraded resources conditions. Park safety is also likely to improve by the reduction of floodwaters during high flow events and by improved access to aquatic resources and park infrastructure.

S3.C SUBFACILITY DETAILS TABLES

Below are subfacility tables for the proposed project activities.

Table 5A. Subfacility Table for Pond Dredging

Subfacility Type	DRG		Dredging		
Id	PHL		Panther Hollow Lake		
County	Allegheny		**Municipality**		Pittsburgh
Latitude Degrees	40	**Latitude Minutes**	26	**Latitude Seconds**	13.1
Longitude Degrees	-79	**Longitude Minutes**	56	**Longitude Seconds**	53.8
Gravelbar or Maintenance Dredging		**Length**	935’	**Width**	135’
Depth	2-4	**Total Bar Area**	N/A	**River Pool**	N/A
River Mile From		**River Mile to**		**Right Side**	N/A
N/A		N/A		**Left Side**	N/A
Offset Restriction	N/A	N/A		**Buffer Width**	N/A

Table 5B. Subfacility Table for Pond Riser Outfall Structure

Subfacility Type	OUTFL		Outfall Structure		
Id	Outfall OS1		Riser Outfall Structure		
County	Allegheny		Municipality		Pittsburgh
Latitude Degrees	40	Latitude Minutes	26	Latitude Seconds	12.4
Longitude Degrees	-79	Longitude	56	Longitude	53.9
Intake/Outfall Type	SW	Stormwater		Velocity	6.14
WOB Material	HDPE	HDPE Plastic	Capacity		851
Diameter	2.5’	Structure Width	2.5’	Pipe Length	445’
Protective Measures	EMBD	Embedded	Location		Bank

Table 5C. Subfacility Table for Principal Spillway Outlet Pipe

Subfacility Type	PIPE		Pipeline		
Id	Principal Spillway Outlet Pipe		Panther Hollow Lake Principal Spillway Pipe		
County	Allegheny		Municipality		Pittsburgh
Latitude Degrees	40	Latitude Minutes	26	Latitude Seconds	12.4
Longitude Degrees	-79	Longitude Minutes	56	Longitude Seconds	53.9
Pipe Conduit Type	TRNC	Open Trenched	Attached Water Obstruction?		No
Product	OTHER	Other, Stormwater			
Diameter	2.5’	ROW Width	10	Pipe Length	445’
Cover Depth	8’-15’	Line Encased	No	Shut Off Controls	No

Table 5D. Subfacility Table for Pond Emergency Drawdown Pipe

Subfacility Type	PIPE		Pipeline		
Id	Emergency Drawdown Pipe		Panther Hollow Lake Emergency Drawdown Pipe		
County	Allegheny		Municipality		Pittsburgh
Latitude Degrees	40	Latitude Minutes	26	Latitude Seconds	12.5
Longitude Degrees	-79	Longitude Minutes	56	Longitude Seconds	53.9
Pipe Conduit Type	TRNC	Open Trenched	Attached Water Obstruction?		No
Product	OTHER	Other, Stormwater			

Table 5D. Subfacility Table for Pond Emergency Drawdown Pipe

DiametEr	0.833’	ROW Width	10	Pipe Length	103’
Cover Depth	7’-12’	Line Encased	No	Shut Off Controls	Yes

Table 5E. Subfacility Table for Wetland 7 Restoration

Subfacility Type	WETRE		Wetland Restoration		
Id	Wetland 7		Wetland Restoration		
County	Allegheny		Municipality		City of Pittsburgh
Latitude Degrees	40	Latitude Minutes	26	Latitude Seconds	13.2
Longitude Degrees	-79	Longitude Minutes	56	Longitude Seconds	49.8
Replacement Area	0.292	Classification	PEM	Palustrine Emergent	
WR Project Objectives		Wetland restoration and improvements.			

Table 5F. Subfacility Table for Dam Embankment Spillway

Subfacility Type	OTHER		Other Activities		
Id	OTHER01		Dam Emergency Spillway		
County	Allegheny		Municipality		City of Pittsburgh
Latitude Degrees	40	Latitude Minutes	26	Latitude Seconds	11.6
Longitude Degrees	-79	Longitude Minutes	56	Longitude Seconds	57.6
Remarks		The emergency spillway for the dam will consist of a broad-crested weir spillway over the embankment and will be concrete-lined.			

Table 5G. Subfacility Table for Dam Embankment Raise

Subfacility Type	OTHER		Other Activities		
Id	OTHER02		Panther Hollow Lake Dam Embankment Raise		
County	Allegheny		Municipality		City of Pittsburgh
Latitude Degrees	40	Latitude Minutes	26	Latitude Seconds	11.6
Longitude Degrees	-79	Longitude Minutes	56	Longitude Seconds	57.6
Remarks		The existing earthen embankment for the dam is proposed to be raised by approximately 4 feet.			

S3.D RESOURCE FUNCTION EFFECTS

S3.D (1) Summary of Subfacility Impacts to Resource Functions

The Project will have direct impacts to the functions of Panther Hollow Run (Stream 10), Phipps Run (Stream 22), Wetland 7, and Panther Hollow Lake. Panther Hollow Lake will be utilized for stormwater retention and storage upstream of the existing CSS in Junction Hollow. A forebay will be constructed in place of the existing overflow structure east of the lake, which will connect to a constructed treatment wetland in place of the existing Wetland 7. The forebay will act as a coarse sediment sink with the wetland capturing fine sediment from the connecting streams. The lake will be drawn-down, after fish removal, dredged, and regraded, according to volume and structure design criteria to meet dam safety standards. A riser will regulate overflow to an outlet, an emergency drawdown pipe and valve, and raised embankments will be constructed in the lake, per PADEP dam requirements, to accommodate greater flow and allow stormwater control. An emergency spillway will be constructed to control flooding and improve downstream safety. Abutting the forebay and the treatment wetland, Panther Hollow Run (Stream 10) and Phipps Run (Stream 22) will have segments of the lower reach channels, floodplain, and riparian buffer restored, which will provide bed and bank stability and adequate connection to the forebay and through the treatment wetland to the lake. See Figure 2 and EC00 Drawings Set.

S3.D (1)(a) Hydrologic

Panther Hollow Lake is laden with sediment, which is transported by Panther Hollow Run and Phipps Run during flash flooding. Decades of sediment build-up has decreased the lake volume and ability to control stormwater flow. The banks are typically overtopped during extreme storm events or periods of frequent heavy rainfall. The overflow channel provides some relief during flooding events, but the overflow channel inlet is repeatedly blocked by sediment and woody debris, which causes the flooding to be redirected to the lake. The project plans to improve the hydrologic functions of the mentioned water resources through stream restoration and bioretention and stormwater structures that will function to slow and retain stormwater, reduce erosion and sedimentation, provide groundwater recharge, and deposit sediment prior to discharging into the combined sewer system.

S3.D (1)(b) Biogeochemical

The floodplains of the streams are narrow and little to no processing of nutrients or pollutants is likely occurring. Wetland 7 will continue to provide sedimentation control at the confluence of Panther Hollow Run and Panther Hollow Lake. Further, nutrient and chemical inputs associated with the Project are expected to decline due to the proposed stormwater controls. It is expected that biogeochemical processes will be improved by the restoration of the stream channels and riparian buffers and the construction of the connecting forebay and wetland that are designed to retain and process sediment, nutrients, and other pollutants.

S3.D (1)(c) Habitat Attributes

Stream habitats and the adjacent terrestrial areas are expected to be maintained or improved. Some of the stream channels provide habitat for benthic macroinvertebrates and amphibians, but there is no suitable habitat for fish species. The lack of shrubs and herbaceous vegetation limits suitable habitat along the stream channels. Wetland 7 has herbaceous plants, sufficient hydroperiods, and water depth that support feeding, breeding, and cover for aquatic invertebrates, amphibians, and/or waterfowl. It is expected that habitat for aquatic, semi-aquatic, and terrestrial life will be maintained or improved by the restoration of the wetland, stream channel segments, and riparian buffers.

S3.D (1)(d) Recreational Uses

No known recreation uses are provided by the existing wetland and streams to be restored, and Panther Hollow Lake has limited recreational use. However, the water resources will be more accessible to the public as a result of the proposed restoration.

S3.D (1)(e) Upstream and Downstream Riparian Properties

Aa detailed in Module S2.D (1)(f), the streams have small drainage areas, steep slopes, and sparse understory vegetation. The neighborhoods, located upslope of the streams, are heavily developed with a great amount of impervious surface. Improvements or no effects are expected for the downstream properties because the proposed restoration and stormwater controls will function to slow and retain stormwater and process pollutants prior to discharging into the CSS. Furthermore, Hydraulic & Hydrologic modeling demonstrates no increase in the extents of the 100-yr flooding. Thus, impacts to upstream or downstream properties are not expected.

S3.E ANTIDEGRADATION ANALYSIS

Projects that are located in special protection watersheds that have a designated or existing use of high quality (HQ) or exceptional value (EV), Wild Trout Streams, or non-special protection watersheds impaired for sediment must demonstrate that all construction and post-construction discharges will not degrade the physical, chemical, or biological characteristics of the surface waters. This project is not located in a special protection (HQ, EV, or siltation impaired) watershed and, thus, an antidegradation analysis is not required. "Non-discharge" BMPs have been utilized to the extent possible in the preparation of this plan, and calculations have been provided as necessary.

S3.F ALTERNATIVES ANALYSIS

The proposed Panther Hollow Lake Restoration impacts the existing dam and palustrine emergent (PEM) wetland located within this palustrine open water (POW) lake. The USEPA's Section 404(b)(1) Guidelines and Pennsylvania Chapter 105 Section 105.18b(3) require that practicable alternatives be considered for projects involving impacts to wetlands and other jurisdictional waters. Both of these regulations require a demonstration that there is no other site design that would not involve impacts to aquatic resources or have lesser impacts while still meeting the basic project purpose. An alternative is considered practicable if it is available and capable of being implemented after taking into consideration construction cost, existing technology, and logistics.

Project background, description, and purpose are described in module S1 of the Environmental Assessment Narrative. The following sections discuss the alternatives that were evaluated for this project.

<u>Alternative 1 – Panther Hollow Lake Remains Unchanged in Existing Conditions</u>

This alternative does not propose any design modifications or enhancements to the existing Panther Hollow Lake footprint, dam height, or storage volume/depth. The lake would remain in its existing conditions, which currently does not provide the hydraulic appurtenances necessary to meet current PADEP Dam Safety regulations. These hydraulic appurtenances consist of a principal spillway pipe and/or an emergency spillway structure to safely convey a large storm event without flooding or damage to downstream entities. The lake's embankment would remain at elevation 810, and the overflow from the lake would continue to discharge into the combined sewer system which ultimately discharges into the Monongahela River.

In its existing conditions, Panther Hollow Lake does not meet the regulatory requirements under Title 25 of the Pennsylvania Code, Chapter 105, Subchapter B Dams and Reservoirs. The Project does not obtain compliance under state and federal water quality laws and regulations to reduce and eliminate sewage contamination in local rivers and streams.

The cost of this alternative would be negligible since there is no proposed work to be done under this alternative.

There is high risk associated with this alternative. By not performing any upgrades to the lake, downstream residents would still be at risk for flooding in their homes and streets creating property damage and safety concerns. Sewage overflows into streams and rivers would continue to frequently occur as well.

This alternative would require existing operation, maintenance, and inspection (OM&I) efforts and would not pose any problems implementing since there is no proposed work to implement. The public may negatively view this alternative since it does not propose any improvements that would benefit the overall health and safety of the community and region.

This alternative was rejected based on the fact that none of the specified goals and benefits of the Project would be fulfilled.

<u>Alternative 2 – Panther Hollow Lake Dredging & Reshaping, Principal Spillway Pipe and Embankment Raise</u>

This alternative proposes a redesign of the lake that will dredge existing sediment from the bottom of the lake, re-shape the perimeter and grading around the shorelines of the lake, installation of a new spillway pipe, and an earthen dam embankment raise. The approximate 2-acre lake redesign is driven by several priorities relevant not only to stormwater management, but also to park amenities. The overall shape of the existing lake will be modified in the design, and space is designated for later development of a lake side pavilion or other facility on the south shore at the same location as the historical boat house. In addition, the lake must provide adequate storage volume in order to regulate the rate of discharge downstream during and after rain events.

Proposed changes to the existing lake include dredging of accumulated sediments and additional material in order to increase the lake depth to a maximum of ten feet. This would help regulate temperature during summer months, help support over-wintering of fish, and limit the frequency with which subsequent maintenance dredging must occur since some loading of fines to the lake interior is inevitable. The existing concrete curbing around the lake shoreline would be removed and graded, and the new shoreline would be planted with a range of native transitional and upland plants, including wetland shrubs, sedges, and rushes, or turf/grass in areas designated for recreation.

The proposed lake design includes the construction of a wet sediment forebay located east of the lake where Phipps Run and Panther Hollow Run streams confluence. The wet sediment forebay would serve as a sediment sump for material transported by these two streams. During dry weather and "normal" rainfall, the forebay would slow the velocity of the contributing flows, allowing particles to drop out of the water column before over-flowing to the treatment wetland, thus limiting the build-up of sediment within the lake itself. During periods of higher contributing flows, larger debris would drop out but fines would remain suspended and would progress to the treatment wetland in the east edge of the pond. During normal operation, the forebay would remain wet with levels controlled by a downstream earthen weir control structure. Periodic maintenance would include excavation of the accumulated material for replacement elsewhere.

Another part of the proposed design is a treatment wetland located at the east end of the lake and west of the proposed forebay. The treatment wetland would be a mounded area that possesses a circuitous channel planted with native wetland species suited to the hydrologic regime. The channel would receive discharges from the forebay by means of the overflow weir. By passing water through the planted circuitous channel, nutrients, contaminants, pathogens, and sediment would be filtered or captured and processed by the natural systems. The treatment wetland was designed with the intent of resembling the existing wetland area that has formed at the east end of the lake and to provide additional water quality benefits at a later date if it appears that the lake water requires further treatment. This would be provided by a recirculation system that would continuously lift lake water to the top of the channel, thus imposing added contact with the wetland plants and soil. The wetland habitat would also provide improved refuge, hydrology, water quality, and sustenance for waterfowl, aquatic invertebrates, amphibians, and spawning fish, and would be accessible from the shoreline.

As a result of the proposed design described above, one wetland area would be disturbed. The existing wetland area located within the existing Panther Hollow Lake footprint would be replaced with the proposed treatment wetland. The proposed forebay design was optimized to avoid the disturbance to the existing wetland located east of the forebay.

In order to facilitate a hydraulic connection between Panther Hollow Lake and a proposed stream extending southward through Junction Hollow and to meet PADEP requirements associated with permitting a dam, a principal spillway and emergency spillway from the lake would be necessary. The principal spillway would consist of a pipe and riser outlet structure extending from the lake and beneath a pair of existing railroad tracks owned by CSX Transportation. The riser outlet structure would be a smooth wall 30" diameter HDPE pipe, oriented vertically, and secured by a concrete thrust block. The elevation of the riser pipe would be maintained at the current lake elevation of 806 feet. The spillway pipe would be a combination of smooth wall steel and HDPE pipe with a diameter of 30-inches. A portion of the spillway pipe will be steel since it is needed for jacking beneath the railroad tracks, per CSX Transportation design guidelines. The jacking and boring work and all proposed pipe and appurtenances located west of the proposed manhole would be part of a separate project and is not included in this permit submittal. The outlet pipe diameter would utilize the available storage capacity of the lake to store stormwater runoff while discharging a volume of stormwater that minimizes the size and capacity of the proposed stream in Junction Hollow and hydraulic features downstream. The pipe would be located on the south side of the lake, generally oriented in an east and west direction. The emergency spillway would be designed as a 25-foot wide open channel hydraulic facility with a concrete control section set at elevation 813.0 feet which would only activate during a storm event greater than 100-year, 24-hour rainfall.

The emergency spillway would discharge into the existing east drainage ditch adjacent to the CSX railroad tracks.

In addition to the proposed spillway pipe, this alternative proposes to raise the earthen embankment of Panther Hollow Lake by approximately 4 feet. The raise would occur along the west side of the existing crest of the embankment, which is conservatively estimated at 40 to 50 feet in width. The raise would create a 15-foot wide new crest and side slopes of three horizontal to one vertical (3H:1V), resulting in an overall width of approximately 40 feet. The additional height would create in excess of 300,000 cubic feet (2.25M gallons) of storage for storm events. In conjunction with the riser pipe design, Panther Hollow Lake would be capable of safely discharging a 100-year, 24-hour storm event without activating the emergency spillway. The earthen embankment will be designed and constructed in accordance with PADEP Dam Safety regulations, geotechnical investigations, and proper construction methods and oversight.

The construction of the principal spillway, in conjunction with the placement of fill to raise the embankment crest elevation would be very effective in protecting downstream residents against flooding associated with a 100-year, 24-hour rain event. The proposed design provides the proper amount of flow for maintaining hydraulic features in Junction Hollow but also minimizes the amount of flow which results in a an optimized, cost effective sizing of hydraulic features through the Four Mile Run area.

The capital cost associated with this alternative is approximately $1.1 million, including contingency, and is considered very inexpensive to complete, when compared to the relative cost of construction of projects currently being performed in Western Pennsylvania, Ohio, and West Virginia. More than one-third of the costs are associated with the construction of the principal spillway structure and the material and installation costs associated with sediment excavation and lake shaping excavation, all of which are critical in the rehabilitation of the lake. Materials associated with maintenance are inexpensive.

The public perception of this alternative would be positively perceived, as the spillway and embankment raise provides protection for downstream residents against flooding associated with storm events, and the embankment raise provides an amphitheater type setting for the lake from the west. The proposed design of the lake has also been positively perceived by Pittsburgh Parks Conservancy as an improvement within Schenley Park.

Operations, Maintenance, and Inspections (OM&I) elements associated with this alternative are easy and effective. Inspection of the spillway could be performed on an as-needed basis, but at a minimum, experienced professionals should perform annual inspections, as well as after a specified intensity rainfall event. It may be necessary to perform the inspections on a semi-annual basis for the first several years, based upon requirements established by PADEP. Materials associated with maintenance would be easy to install. OM&I of the embankment raise would primarily consist of observation of the embankment slopes to observe instability and for burrowing animals that may reduce the integrity of the fill.

The proposed construction carries some risk. PWSA maintains a 50" diameter steel waterline within the existing lake embankment, beneath the area where the embankment raise is proposed. The waterline does not currently interfere with the design as described above, but is aged and may need replaced. A 15" ductile iron pipe (DIP) is also located within the embankment, directly beneath the embankment raise. This waterline would be abandoned in place and relocated outside of the proposed embankment. The jack and bore method and equipment utilized to advance the culvert beneath the active railroad tracks, although more routine than 20 years ago, would require a high level of detail and precision, with oversight by CSX personnel. Connection of the steel and HDPE pipe is routine and requires hand equipment and semi-skilled labor. There is a very low risk associated with design and construction of the remaining portions of the spillway pipe and the embankment raise.

Based on the information presented above, it was determined Alternative 2 is the preferred alternative. This alternative meets the goals of the project, in that it upgrades the dam to meet PADEP regulations, controls sediment deposition from upper watershed hydraulic facilities, ultimately reduces CSO, and is the feature that controls and removes stormwater from the existing PWSA piping system, which may reduce basement flooding to residential areas at locations downstream of the Project.

S3.G POTENTIAL SECONDARY IMPACT EVALUATION

Erosion and sediment (E&S) control plans were prepared as part of this permit submittal. The E&S plans employ various temporary Best Management Practices (BMPs) to reduce the potential for on and off site aquatic resources to receive sediment-laden runoff.

S3.H CUMULATIVE IMPACTS EVALUATION

The project is not planned in phases; all of the impacts have been discussed in previous sections of this narrative. This project includes lake, wetland, stream, and floodplain restoration; dam enhancement; and stormwater bioretention structures. These elements should create ecological uplift for the project area and its surrounding landscape. The aquatic resource impacts that are proposed may be greatly offset by restoration and enhancement efforts, including improved water quality, sediment reduction, and dam safety which will ultimately reduce flooding within the project area.

MODULE S4: MITIGATION PLAN

S4.A RESOURCE AVOIDANCE AND IMPACT MINIMIZATION

As discussed in S3.F, the site design took into consideration avoidance and minimization of aquatic resources to the maximum extent practicable, including: avoiding aquatic resources, reducing the limit-of-disturbance, and minimizing tree clearing activity. The site layout started with an early conceptual design and was refined through several iterations of site design alternatives while still meeting the Project purpose and need. Only the water resources slated for restoration and enhancement activities will be temporarily impacted and the restoration plans are designed to provide ecological uplift.

S4.B REPAIR, REHABILITATION, AND RESTORATION OF IMPACTED RESOURCES

At the confluence of Phipps Run and Panther Hollow Run, a forebay will be installed to trap coarse sediment before entering Panther Hollow Lake. Based on estimated sediment supply, sediment will need to be removed from this forebay on approximately annual basis. Creation of the forebay will involve removal of the concrete control structure that is currently at this location and regrading. The control structure currently diverts higher flows to a concrete channel that runs along the north side of the lake and enters the combined sewer system near the lakes northwest corner. The control structure is frequently jammed with debris and functions poorly; it will be removed and the concrete channel will be filled.

Additionally, over the years since the lake was last dredged, a wetland has developed on accumulated sediment downstream of where Panther Hollow Run enters the lake. Rehabilitation of Panther Hollow Lake will involve disturbance to this wetland to allow it to better funcition as habitat and to filtern fine sediment before entering the water column of the lake proper.

Finally, the existing concrete stepped edge of Panther Hollow Lake will be replaced and the lake will be dredged. The dam will also be modified to bring it into Dam Safety compliance. The shore will be graded to a slope of 20:1 to 40:1 and planted with native wetland vegetation. The interior of the lake will be deepened to from approximately 4 to 10 feet to allow areas of cooler summer temperatures. The outline of the lake will change slightly. The southwestern corner of the lake will be brought in to make room for a future pedestrian passageway under the railroad tracks. Offsetting this will be an extension northwestern corner of the lake. Overall, the shape of the lake will approximate its 1908-1957 shape with its natural edge.

These activities will result in impacts of approximately 40 feet of Phipps Run, 167 feet of Panther Hollow Run, and 0.29 acre of wetland within Panther Hollow Lake. Temporary disturbance of these resources associated with their rehabilitation will be mitigated in place, resulting in no net loss of aquatic resources. Addtionally, the entire concrete stepped shoreline of the lake will be removed and replaced with an earthen edge with native herbaceous wetland plantings.

CEC ecologists delineated existing streams and wetlands within the proposed project site in October 2017 and October 2018 (see accompanying delineation report). Refer to Enclosure A of the Environmental Assessment for the wetland and stream delineation report, including wetland data forms, and photographs. In addition, CEC collected baseline information at both the impact and mitigation sites using the Pennsylvania Department of Environmental Protection Level 2 Rapid Assessment Riverine and Wetland Protocols.

The coarse sediment forebay is designed to provide an area with reduced sediment transport capability to allow sediment to settle from the water column before entering the lake. The location and size of the forebay were selected based on accessibility; overlapping footprint with the existing, poorly functioning control structure that is to be removed; and the need to avoid impacts to adjacent wetland 008, trees (per City of Pittsburgh tree canopy ordinance and requirement as landowner), and the historic (1939 Works Progress Administration) bridge crossing Panther Hollow Run. The forebay will need to be maintained approximately annually. Therefore it is designed with an armored access point its southern bank. Remaining banks will be vegetated with native riparian vegetation.

Wetland 007 within Panther Hollow Lake will be regraded and a channel will be graded to allow lower flows to meander through the wetland, allowing wetland vegetation to filter sediment before the water enters the lake proper. Higher flows will bypass the wetland on its southern edge. This is very similar to the existing flow of water, but in the proposed state the wetland will be designed to better trap sediment. The wetland will be replanted with native herbaceous wetland vegetation.

PERFORMANCE STANDARDS

The proposed restoration plan will rehabilitate the existing aquatic resources in place, resulting in no net loss of aquatic resources. The following performance standards will be used to determine the success of the project.

Coarse Sediment Forebay:

(1) The banks of the sediment forebay will be planted with appropriate native riparian plant species, These species will provide greater than 85% areal vegetative cover.

(2) The banks fo the sediment forebay will not have more than 10% areal coverage by any plant listed as an invasive species on the the U.S. National Park Service (NPS) and USFWS list of Plant Invaders of Mid-Atlantic Natural Areas (http://www.nps.gov/plants/alien/pubs/midatlantic/).

(3) Forebay banks will be stable and not exhibit signs of excessive scour or erosion. The forebay will have a minimum water depth of 2 feet over at least 50% of its designed bottom area to allow sediment to settle.

Wetland 007

(4) The wetland rehabilitation area will provide a minimum of 0.29 acre of palustrine emergent wetland by the end of the fifth year of monitoring.

(5) The wetland rehabilitation area will be planted with appropriate native emergent plant species, of which greater than 50% of the dominant plant species will be classified as obligate, facultative wetland, or facultative. These species will provide greater than 85% areal vegetative cover.

(6) The wetland rehabilitation area will not have more than 10% areal coverage by any plant listed as an invasive species on the the U.S. National Park Service (NPS) and USFWS list of Plant Invaders of Mid-Atlantic Natural Areas (http://www.nps.gov/plants/alien/pubs/midatlantic/).

(7) Pennsylvania Department of Environmental Protection Level 2 Rapid Assessment Wetland Protocol will meet or exceed the pre-disturbance score by the fifth year following restoration.

Panther Hollow Lake

(1) The shoreline and emergent shelf of the lake will be planted with appropriate native riparian, emergent, and floating plant species.

(2) The shoreline and emergent shelf of the lake area will not have more than 10% areal coverage by any plant listed as an invasive species on the the U.S. National Park Service (NPS) and USFWS list of Plant Invaders of Mid-Atlantic Natural Areas (http://www.nps.gov/plants/alien/pubs/midatlantic/).

Each of the above criteria will be observed annually for a period of 5 years. Additionally, permanent photograph locations will be established in each area to assess progress through the monitoring period. A report of findings will be prepared and submitted annually.

MAINTENANCE AND LONG-TERM MANAGEMENT PLAN

The City of Pittsburgh is committed to the success of this project and designed this rehabilitation plan to survive well beyond the five-year monitoring and maintenance period. If the site is meeting all performance standards by the end of the fifth (or prior) year, the site should be considered stable and able to sustain itself well into the future. Though maintenance requirements vary from site to site, they are generally driven by the following conditions:

- Projects without established vegetation are more susceptible to erosion than those with a mature forest.

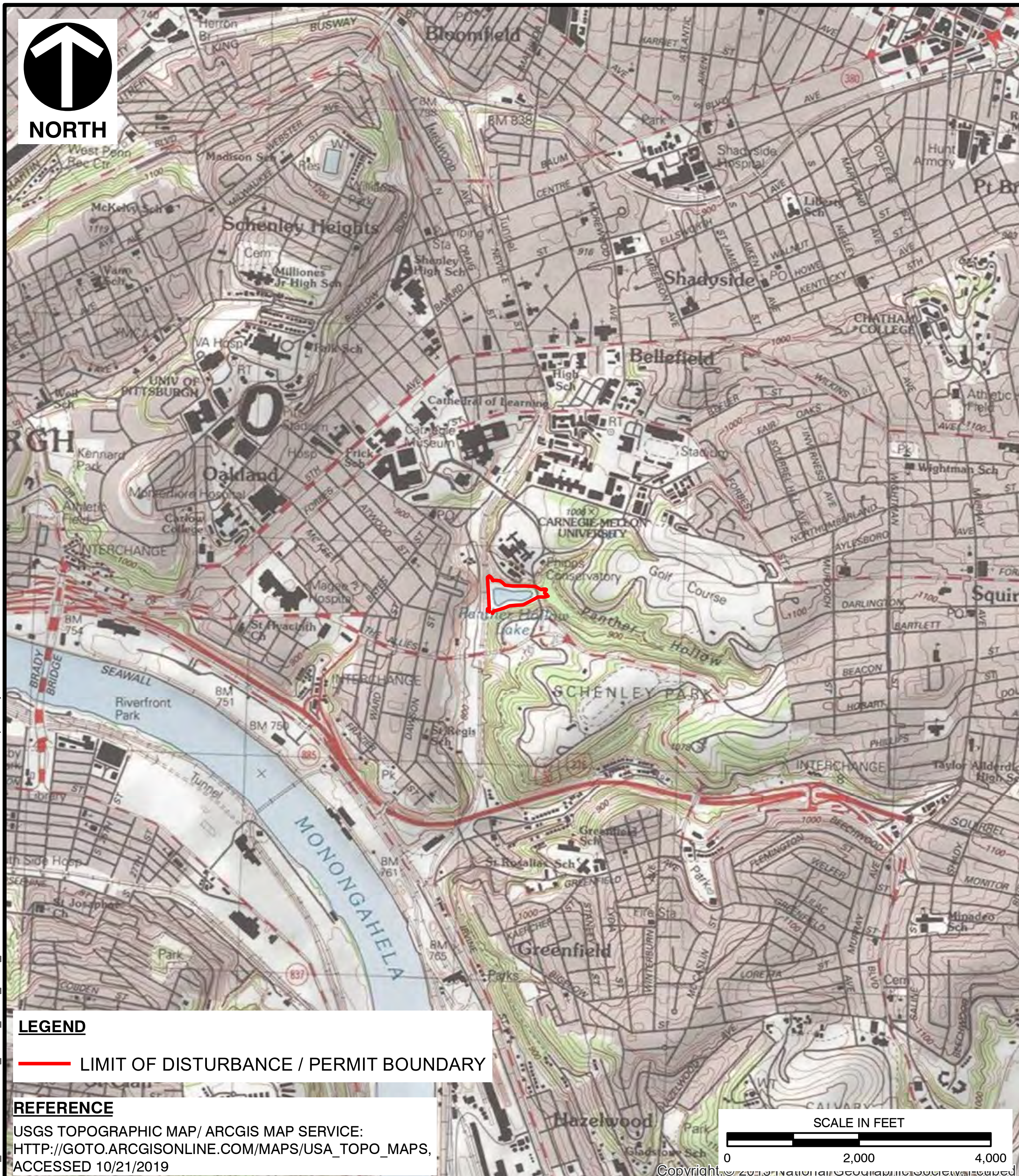
- Extreme and/or frequent flooding can cause floodplain and channel erosion.
- Extremely hot, cold, wet, or dry weather during and after construction can limit vegetation growth, particularly for temporary and permanent seeded species.
- The presence and aggressiveness of invasive species can affect the extent to which a native buffer can be established.
- Excessive sedimentation or insufficiently frequent removal of accumulated sediment in the coarse sediment forebay will diminish its ability to function as designed, and result in undesirable sediment delivery to Panther Hollow Lake and Wetland 007.

Addressing any deficiencies early and proactively abating potential problems before they occur can largely mitigate these conditions. The five-year monitoring and maintenance period is intended to cover the period of time during which these issues are most likely to arise. Annual monitoring reports will describe and document any maintenance issues and recommended remediation measures identified during monitoring. Any corrective actions will be addressed in a timely manner.

S4.C COMPENSATORY MITIGATION

No mitigation is anticipated to be required for this project because the impacts to aquatic resources for the Project involve enhancing and restoring the resources, as described in S4.B. No secondary or cumulative impacts are anticipated by the Project, and an appropriate E&S Plan will be utilized during construction. Wetlands abutting the limits of disturbance will be protected from accidental disturbance by the installation of silt fence along the wetland edge.

FIGURES



LEGEND

LIMIT OF DISTURBANCE / PERMIT BOUNDARY

REFERENCE

USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE:
HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS,
ACCESSED 10/21/2019

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ALLEGHENY COUNTY, PENNSYLVANIA

SITE LOCATION MAP

DRAWN BY: SML	CHECKED BY: AM	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO: 1
DATE: 10/21/2019	SCALE: 1 " = 2,000 '	PROJECT NO: 174-960	

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REFERENCE

Esri, HERE, Garmin, (c) OpenStreetMap contributors.
Accessed: 10/21/2019.

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES
GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017.

LEGEND

- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- PEM WETLAND
- PSS WETLAND
- LAKE
- LIMIT OF DISTURBANCE / PERMIT BOUNDARY

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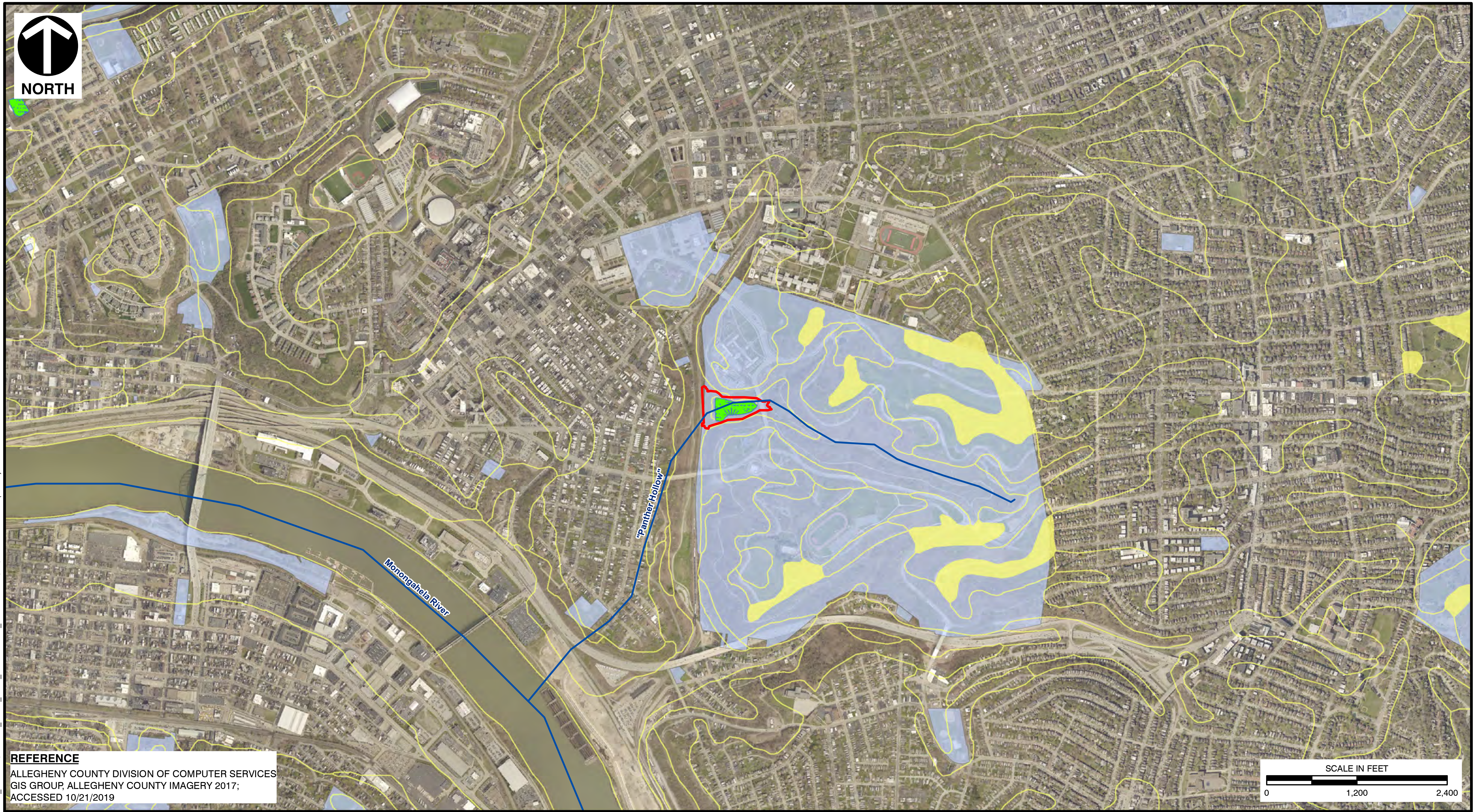
AQUATIC RESOURCES MAP

DRAWN BY:	SML	CHECKED BY:	AM	APPROVED BY: * Hand signature on file	DRAFT	FIGURE NO:	2
DATE:	10/21/2019	SCALE:	1 " = 100 '	PROJECT NO:	174-960		

P:\2017\174-960\-GIS\Maps\EC09_DAM_PERMIT\174960_EC09_FIG2_AQUATIC_RESOURCES.mxd 10/21/2019 1:32 PM (slavin)



LEGEND

305B STREAM	NATIONAL CULTURAL LANDMARK (not present)
SCENIC RIVER (not present)	STATE PARK (not present)
STATE GAMELAND (not present)	MUNICIPAL WATER SUPPLY (not present)
STATE FOREST (not present)	NWI WETLANDS
SOIL MAP UNIT	PRIME FARMLAND
ALLEGHENY COUNTY PARKS	TOWNSHIP BOUNDARY
LIMIT OF DISTURBANCE / PERMIT BOUNDARY	

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RESOURCE MAP

DRAWN BY: SML	CHECKED BY: AM	APPROVED BY: * Hand signature on file	DRAFT	FIGURE NO:	3
DATE: 10/21/2019	SCALE: 1 " = 1,200 '	PROJECT NO:	174-960		

P:\2017\174-960\-GIS\Maps\EC09_DAM_PERMIT\174960_EC09_FIG3_RESOURCE_MAP.mxd 10/21/2019 1:22 PM (slavin)

REFERENCE
Esri, HERE, Garmin, (c) OpenStreetMap contributors.
Accessed: 10/21/2019.

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES
GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017.

LEGEND

- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- ASSESSMENT AREA (AA)
- LIMIT OF DISTURBANCE / PERMIT BOUNDARY

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STREAM RAP INDEX MAP

DRAWN BY:	SML	CHECKED BY:	AM	APPROVED BY:	* Hand signature on file DRAFT	FIGURE NO:	4
DATE:	10/21/2019	SCALE:	1 " = 80 '	PROJECT NO:	174-960		

P:\2017\174-960\-GIS\Maps\EC09_DAM_PERMIT\174960_EC09_FIG4_STREAM_RAP_INDEX.mxd 10/21/2019 1:24 PM (slavin)

P:\2017\174-960\-GIS\Maps\EC09_DAM_PERMIT\174960_EC09_FIG4A_STREAM_RAP_AA-1.mxd 10/21/2019 1:30 PM (slavin)

REFERENCE

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017; ACCESSED 10/21/2019

LEGEND

- PERENNIAL STREAM
- RIPARIAN VEGETATION ZONE
- ZONE OF INFLUENCE
- ASSESSMENT AREA (AA)
- LIMIT OF DISTURBANCE / PERMIT BOUNDARY

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PA RIVERINE CONDITION LEVEL 2 RAPID ASSESSMENT PROTOCOL MAP - STREAM 10 (AA-1)

DRAWN BY: SML	CHECKED BY: AM	APPROVED BY:	* Hand signature on file	DRAFT	FIGURE NO:	4A
DATE: 10/21/2019	SCALE: 1 " = 100 '	PROJECT NO:		174-960		

P:\2017\174-960\-GIS\Maps\EC09_DAM_PERMIT\174960_EC09_FIG4B_STREAM_RAP_AA-2.mxd 10/21/2019 1:29 PM (slavin)

REFERENCE

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017; ACCESSED 10/21/2019

LEGEND

- PERENNIAL STREAM
- RIPARIAN VEGETATION ZONE
- ZONE OF INFLUENCE
- ASSESSMENT AREA (AA)
- LIMIT OF DISTURBANCE / PERMIT BOUNDARY

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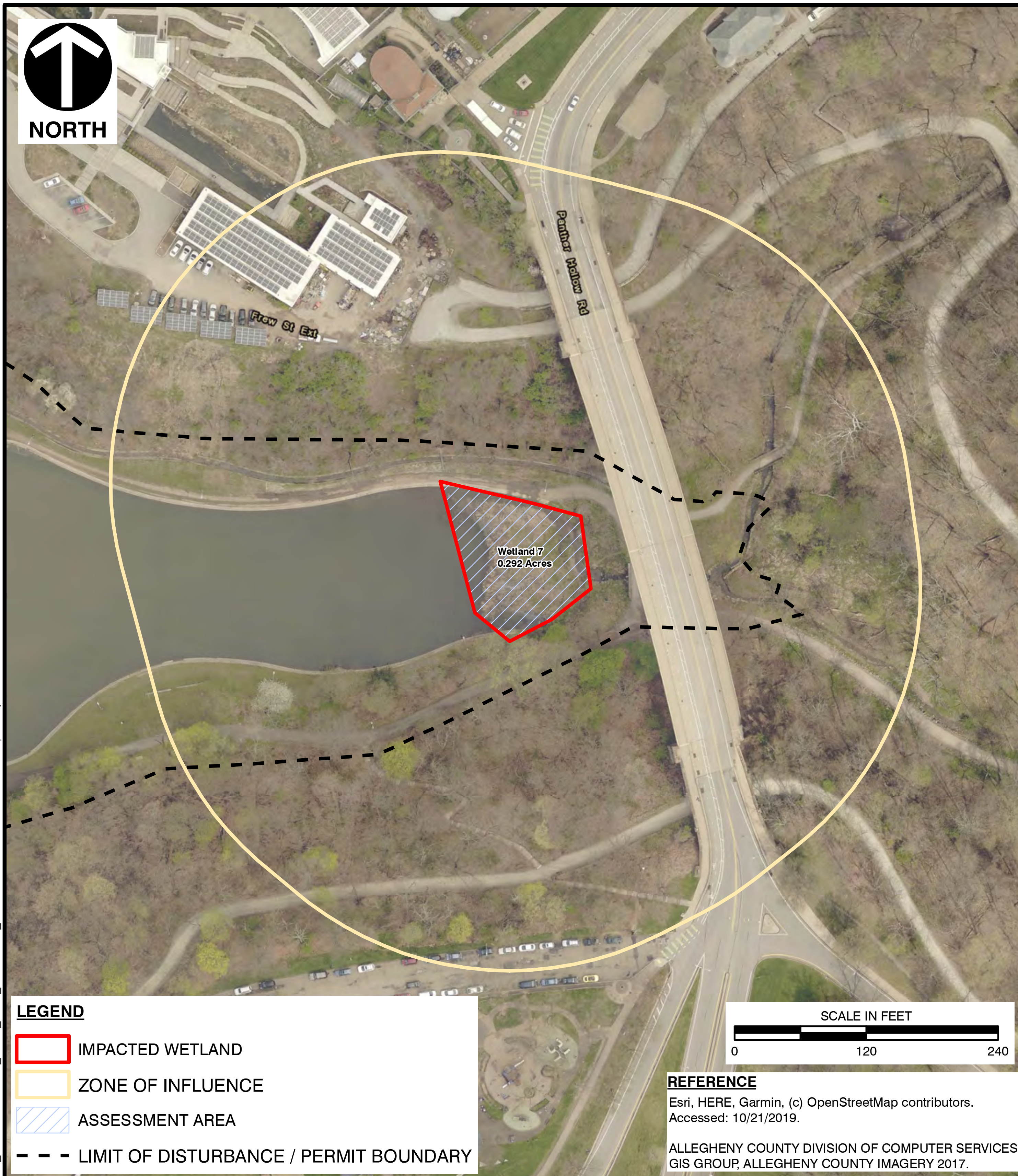
PA RIVERINE CONDITION LEVEL 2 RAPID ASSESSMENT PROTOCOL MAP - STREAM 22 (AA-2)

DRAWN BY: SML	CHECKED BY: AM	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO:	4B
DATE: 10/21/2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960		



REFERENCE

Esri, HERE, Garmin, (c) OpenStreetMap contributors.
Accessed: 10/21/2019.

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES
GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017.

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PA WETLAND CONDITION LEVEL 2 RAPID ASSESSMENT PROTOCOL MAP - WETLAND 7

DRAWN BY: SML	CHECKED BY: AM	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO: 5
DATE: 10/21/2019	SCALE: 1 " = 120 '	PROJECT NO: 174-960	

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P:\2017\174-960\-GIS\Maps\EC09_DAM_PERMIT\174960_EC09_FIG6_LAKE_RAP.mxd 10/21/2019 1:18 PM (slavin)

REFERENCE

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017; ACCESSED 10/21/2019

LEGEND

- AREA OF DIRECT IMPACT
- RIPARIAN SHORELINE VEGETATION ZONE
- ZONE OF INFLUENCE
- ASSESSMENT AREA
- LIMIT OF DISTURBANCE / PERMIT BOUNDARY

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PA LACUSTRINE CONDITION LEVEL 2 RAPID ASSESSMENT PROTOCOL MAP - PANTHER HOLLOW

DRAWN BY: SML	CHECKED BY: AM	APPROVED BY: * Hand signature on file	DRAFT	FIGURE NO:	6
DATE: 10/21/2019	SCALE: 1 " = 100 '	PROJECT NO:	174-960		

APPENDIX A

WETLAND DELINEATION AND WATERCOURSE IDENTIFICATION REPORT

Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

WETLAND AND WATER RESOURCES REPORT

Prepared For:

The City of Pittsburgh, Department of Public Works
Parks Maintenance Division
and
Pittsburgh Water and Sewer Authority

Prepared By:

Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

October 21, 2019

Permit

Wetland and Water Resources Delineation Report

The City of Pittsburgh, Department of Public Works and Pittsburgh Water and Sewer Authority
Panther Hollow Lake Rehabilitation Project
Allegheny County, Schenley Park, Pittsburgh Pennsylvania

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

On behalf of Pittsburgh Water and Sewer Authority (PWSA), Civil & Environmental Consultants, Inc. (CEC) conducted an investigation for streams, wetlands, and other waterbodies for the Panther Hollow Lake Rehabilitation Project. The Panther Hollow Lake Rehabilitation project is located in the northwestern portion of Schenley Park within the City of Pittsburgh, Allegheny County, Pennsylvania. The purpose of the investigations was to identify and delineate potentially jurisdictional features in the vicinity of the proposed project site that are subject to regulation by the U.S. Army Corps of Engineers (USACE) and the Pennsylvania Department of Environmental Protection (PADEP. Sections 2 and 3 of this report present the methodology and findings of these investigations, respectively.

2.0 METHODOLOGY

2.1 BACKGROUND DATA SOURCES

A study area was established based on the proposed project plan. The following data sources were then reviewed to aid in the identification and delineation of wetlands, streams, and other waters within the study area:

- U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle mapping;
- U.S. Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) Database;
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI); and

Historical aerial imagery from various sources.

2.2 WETLAND DELINEATION METHODOLOGY

CEC ecologists reviewed the study area for potential wetlands in accordance with the routine, onsite determination methodology described in the U.S. Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987); referred to hereafter as Corps Manual, supplemented by the following technical guidance documents:

- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (January 2012); referred to hereafter as Regional Supplement;
- *National Wetland Plant List* (Lichvar, et al. 2016); and
- *Field Indicators of Hydric Soils in the United States* (USDA-NRCS 2017).

CEC ecologists walked the study area and collected sampling points at wetlands and representative upland locations. Data collected at each sampling point was recorded on a Wetland Determination Data Form.

At each sampling point, the following parameters were assessed: vegetation, soils, and hydrology. First, visual estimates of percent absolute cover of plant species were recorded for each of the following stratums, when present: tree, sapling/shrub, herb, and woody vine. A determination of whether the plant community was dominated by hydrophytic (wetland) plants was then made using the Rapid Test or Dominance Test indicators. Next, soils were typically sampled to a depth of at least 16 inches, and the soil profile was evaluated to determine if it exhibited hydric soil indicators. Lastly, indicators of wetland hydrology (e.g. surface water, high water table, saturation, etc.) were recorded, if present. If a parameter was determined to be significantly disturbed or naturally problematic, procedures described in the Corps Manual and Regional Supplement for atypical and problematic situations were applied.

The onsite sampling point data, in conjunction with the information compiled during the preliminary data gathering were used to determine if the sampling point was located in a wetland. If a wetland was identified, further sampling was performed to locate the wetland/non-wetland boundary. Each wetland was also classified according to the system developed by Cowardin et al. (1979). If more than one Cowardin classification type was identified within a wetland, the boundary between the types was located. Wetland boundaries located using a Trimble GeoExplorer® series GPS unit.

2.3 STREAM AND OTHER WATERS DELINEATION

CEC ecologists assessed the site for streams and other waters such as ponds, seeps, springs, and vernal pools. These aquatic resources can be identified by the presence of an ordinary high water mark in accordance with USACE Regulatory Guidance Letter No. 05-05: Ordinary High Water Mark Identification (USACE 2005).

An OHWM is defined by Federal Regulations (CFR) Part 328.3(e) as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (U.S. Congress 1986).

For streams, physical and biological data were used to infer the stream's hydrologic flow regime, using a weight-of-evidence approach. CEC used field indicators such as flow, substrate composition, presence of defined bed and bank, origin of hydrologic sources, presence/absence of vegetation within the stream channel, and presence/absence benthic macroinvertebrates, fish, and other aquatic biota to classify onsite stream segments into one of three stream types as defined by USACE (2017):

- **An ephemeral stream** has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.
- **An intermittent stream** has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.
- **A perennial stream** has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

The uppermost limit of an ephemeral stream is established where the stream loses its defined bed and bank or ordinary high water mark, and a predominance of upland vegetation was observed in the channel. When present, streams were located using a Trimble GeoExplorer® series GPS unit. The physical characteristics of the streams and field observations were summarized on field data forms.

3.0 FINDINGS

The results of the background data review and field reconnaissance are presented below. Field data forms, photographs, and other supporting data are enclosed as Appendices.

3.1 BACKGROUND DATA REVIEW

3.1.1 Topographic and NWI Maps

The Panther Hollow Lake Rehabilitation project is located in the northwestern portion of Schenley Park. This includes the region north of Boulevard of the Allies, south of Phipps Conservatory and Botanical Gardens and Schenley Drive, and below the Panther Hollow Road Bridge. Within this reach is Phipps Run, which flows southwest in a steep-sloped valley between Schenley Drive and West Circuit Road, and Panther Hollow Run, which flows west-northwest in the central valley of Schenley Park north of Panther Hollow Road. The USGS 7.5-minute topographic quadrangle map (Figure 1) does not identify any streams within this study area. The NWI data (Figure 2) identifies one permanently flooded palustrine unconsolidated bottom (PUBH) wetland that is Panther Hollow Lake. Soil map units from the SSURGO dataset (Figure 2) that occur within the study area are listen in Table 3-1.

3.1.2 USDA Soils Maps

Table 3-1 identifies the soil types found within the study area according to USDA-NRCS (2008) mapping, as depicted on Figure 2. None of the soil types found within the study area are rated as hydric, and all are rated as either high runoff (UB) or well drained (GQF).

3.2 FIELD RECONNAISSANCE

CEC ecologists conducted field investigations of the study area between May 24 and August 29, 2018. A discussion of the aquatic resources identified is provided below. Data forms and photographs for delineated features are enclosed as Appendices. Tables 3-2 and 3-3 summarize the wetlands and streams identified within the study area, respectively. Figure 3 depicts the delineated boundaries of aquatic resources, Test Sites, and photographs.

3.2.1 General Site Description

The Panther Hollow Lake Rehabilitation project is located in the northwestern portion of Schenley Park. The lake is met by steep hillslopes to the north and south, a pair of railroad tracks to the west, a small, historic footbridge at its mouth on the eastern side, and the confluence of Panther Hollow Run and Phipps Run just upstream of the bridge. A gravel foot trail loops around the perimeter of the lake, and a small concrete overflow channel occurs from the stream confluence around the north side of the lake where it ties into a stormwater pipe.

3.2.2 Wetland Delineations

Two (2) wetlands were identified within the project study area. Wetland 7 was delineated as a 0.292-acre palustrine emergent (PEM) wetland where the NWI PUBH wetland occurs. Wetland 8 had both palustrine scrub-shrub/palustrine emergent (PSS/PEM) characteristics, and separate test sites were dug to confirm these conditions. The PEM portion of Wetland 8 covered 0.27 of the 0.32-acre total. A summary of the wetlands identified and delineated within the study area are listed in Table 3-2.

3.2.3 General Site Description

Two (2) perennial streams were identified within the project study area. Panther Hollow Run (Stream 10) consists of a total length of 4,024 ft before entering the eastern side of Panther Hollow Lake. Phipps Run consists of a total length of 2,372 feet before meeting Panther Hollow Run.

TABLE 3-1
SOIL MAPPING UNITS WITHIN THE STUDY AREA

Soil Mapping Unit Name	Soil Mapping Unit Symbol	Drainage Class	Hydric Rating (Landform)
Urban land	UB	High runoff class	No
Gilpin-Upshur complex, very steep	GQF	Well drained	No

TABLE 3-2
WETLANDS WITHIN THE STUDY AREA

Waters Name	Cowardin Classification[1]	Test Sites	Photo Number	Acres	Latitude (NAD 83)	Long. (NAD 83)	Proximal Water body	Probable USACE Jurisdictional Status[2]
Wetland 7	PEM	TS-12	1, 9	0.292	40.43711	-79.9472	Panther Hollow Lake	RPW
Wetland 8	PEM	TS-13	2	0.27	40.43651	-79.94567	Panther Hollow Run (CEC Stream 10)	RPW
Wetland 8	PSS	TS-32	3	0.05	40.43711	-79.94629	Panther Hollow Run (CEC Stream 10)	RPW
Total Acres				0.612				

1 PEM – Palustrine Emergent Wetland; PSS – Palustrine Scrub Shrub Wetland; PFO – Palustrine Forested Wetland; PUB – Palustrine Unconsolidated Bottom; and POW – Palustrine Open Water.

2 Jurisdictional Status is the opinion of CEC and must be confirmed by PADEP review and/or a USACE Jurisdictional Determination. RPW – non-navigable relatively permanent waters; non-RPW – non-navigable not relatively permanent waters; and TNW – Traditionally Navigable Water. Adjacent means bordering, contiguous, or neighboring, but separated from other waters by man-made dikes or barriers, natural river berms. Abutting means in direct contact with other waters. Isolated means lacking a "discrete surface water connection" with other waters of the U.S. and lacking an interstate commerce connection.

TABLE 3-3
STREAMS WITHIN THE STUDY AREA

CEC Stream Code	Waters Name	Waters Classification	Average Top-of-Bank Channel Width	Linear Feet Within Study Area	Photo Number	Protected Use Designation[1]	Stocked or Wild Trout Stream[2]	Probable Jurisdictional Status[3]
Stream 010	Panther Hollow Run	Perennial	10	428	5, 6	WWF	No	RPW
Stream 022	Phipps Run	Perennial	8	189	7, 8	WWF	No	RPW
Total Linear Feet				617				

1 Designated Uses, Existing Uses, or Special Protections as classified by PA Code Title 25 Chapter 93: WWF – Warm Water Fishery; CWF – Cold Water Fishery; TSF – Trout Stocked Fishery; HQ – High Quality; MF – Migratory Fishery; or EV – Exceptional Value.

2 As listed as a stocked or approved trout waters or wild trout stream by the PFBC from http://www.fish.state.pa.us/waters_trout.htm. Unlisted unnamed tributaries are listed by their assessed receiving waters.

3 Jurisdictional Status is the opinion of CEC and must be confirmed by PADEP review and/or a USACE Jurisdictional Determination. RPW – non-navigable relatively permanent waters, a tributary where flow is year-round or continuous (generally 3 months or longer) at least "seasonally"; non-RPW – non-navigable not relatively permanent waters, a tributary without year-round or seasonally continuous flows (generally less than 3 months of flow); and TNW – Traditionally Navigable Water.

4.0 REGULATORY CONSIDERATIONS

A wetland and stream jurisdictional determination meeting (related to this delineation report) with regulatory agencies has not occurred at the site. Wetlands, streams and other waters that meet the guidelines contained in the Corps Manual, Regional Supplement, and Regulatory Guidance Letter No. 05-05 are subject to regulation by USACE as "waters of the U.S.", as defined by 33 CFR 328.3(a) (U.S. Congress 1986). USACE has authority to permit the discharge of dredged or fill material into waters of the U.S. under Section 404 of the federal Clean Water Act (U.S. Congress 1977). Additionally, Section 401 of the Clean Water Act requires state agencies to evaluate whether discharges to these waters comply with state water quality standards (U.S. Congress 1977). A Section 401 Water Quality Certification is required for activities that require federal permits or authorizations.

The PADEP has coinciding jurisdiction over "waters of the Commonwealth" as established by the Dam Safety and Encroachments Act (P.L. 1375, No. 325) and the Clean Streams Law (P.L. 1987, No. 3941). The PA Code of State Regulations, in Title 25, Chapter 105 Dam Safety and Waterway Management, defines "Waters of the Commonwealth," as any watercourse, stream, waterbody, or wetland, including their floodways. Similar to the USACE, PADEP generally considers channels to be potentially jurisdictional if they exhibit defined bed and banks, whether natural or artificial, with perennial or intermittent flow. The PADEP regulates encroachments, defined as "*any structure or activity which changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water,*" through the Chapter 105 permit process. The floodway is defined as extending 50 feet from the top of bank of watercourses if not delineated by a FEMA study.

In Pennsylvania, the USACE has delegated authority to the PADEP to authorize minor qualifying activities through the state-wide Section 404 permit titled PA State Programmatic General Permit 4 (PASPGP-4), with concurrent review by USACE for certain categories of impacts. A Joint Permit Application to PADEP and USACE is typically required for activities with more significant impacts that exceed the thresholds of PA Chapter 105 General Permits and PASPGP-4. In addition to encroachments, permits for discharges to waters, including from construction stormwater runoff or erosion, may be required under National Pollutant Discharge Elimination System (NPDES) and PA Chapter 102 regulations.

Title 25, Chapter 93 of the PA Code sets forth designated uses and water quality standards for surface waters that are used to determine eligibility and evaluate encroachments authorized under Chapter 105. Aquatic life use designations include Cold Water Fishes (CWF), Warm Water Fishes (WWF), Migratory Fishes (MF), and Trout Stocking (TSF). Statewide water uses including Water Supply and Recreation listed in Table 2 of PA Chapter 93.4 apply to all waterbodies unless a specific exception is indicated in PA Chapter 93.9(a)—93.9(z).

Waterbodies may also be designated special protection as High Quality (HQ) or Exceptional Value (EV) waters. HQ waterbodies are surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water by satisfying one or more of the conditions listed in PA Chapter 93.4b(a). EV waterbodies are surface waterbodies of high quality that satisfy one or more of the conditions listed in PA Chapter 93.4b(b). Also, the PA Fish and Boat Commission (PFBC) classifies streams as Approved Trout Waters that have significant portions that are open to public fishing and are stocked with trout, in accordance with Title 58, Chapter 63.20. The PFBC also lists streams as *Stream Sections that Supports Natural Reproduction of Trout* in accordance with PA Code Title 58, Chapter 57.11. Wetlands located within the floodplain of PFBC-listed wild trout streams and their tributaries thereto are provided EV protection in accordance with PA Code Chapter 105.17.

5.0 CONCLUSIONS

Two wetland areas totaling 0.612 acre were identified and delineation within the study area. A total of 6,396 linear feet of stream channel across 2 streams were identified. Wetland 7 is a PEM cattail stand on the eastern side of Panther Hollow Lake, and is fed by the confluence of Panther Hollow Run and Phipps Run. Wetland 8 is a PEM/PFO adjacent to Panther Hollow Run and Phipps Run near their confluence. Panther Hollow Lake is classified as a NWI PUBH wetland and is fed by both Panther Hollow Run and Phipps Run and by surface runoff throughout Schenley Park and the surrounding urban landscape. Panther Hollow Run and Phipps Run are both perennial streams that tend to carry high sediment loads, react strongly to large rain events, and have erosive forces that shift the stream channel and sand/gravel bars located throughout.

All the streams and wetlands identified within the study area are anticipated to be considered waters subject to jurisdiction by state and federal agencies. Additionally, the area within 50 feet of the top of the stream banks would be jurisdictional as a floodway under PADEP Chapter 105. Therefore, CEC anticipates that impacts or encroachments to these resources as a result of proposed construction activities would require PA Chapter 105 and/or CWA Section 404 permits and Section 401 WQC. Direct or indirect discharges, including construction runoff, to these resources may require National Pollutant Discharge Elimination System permits. A floodplain permit from the local municipal or county floodplain coordination may be required for activities within a mapped FEMA floodplain. Additional authorization may be required for other activities that have direct or indirect impacts to these aquatic resources. In general, CEC recommends that site design include avoidance and/or minimization of impacts to these features to the extent practicable to fulfill the project purpose and need.

6.0 LEVEL OF CARE

CEC's wetlands and stream delineation services were conducted in a manner consistent with the criteria contained in the 1987 Corps Manual and 2012 Regional Supplement, and with the level of care and skill ordinarily exercised by members of the environmental consulting profession practicing contemporaneously under similar conditions in the locality of the project. It must be recognized that the delineation of waters was based on field observations and CEC's professional interpretation of the criteria in the 1987 Corps Manual and the Regional Supplements at the time of our fieldwork. The regulatory jurisdiction of aquatic resources identified in this report is the opinion of CEC and must be confirmed by USACE through a formal Jurisdictional Determination process or equivalent state agency review. Wetland determinations may change subsequent to CEC's delineation based on changes in the regulatory criteria, seasonal variations in hydrology, alterations to drainage patterns, or other human activities and/or natural land disturbances.

7.0 REFERENCES

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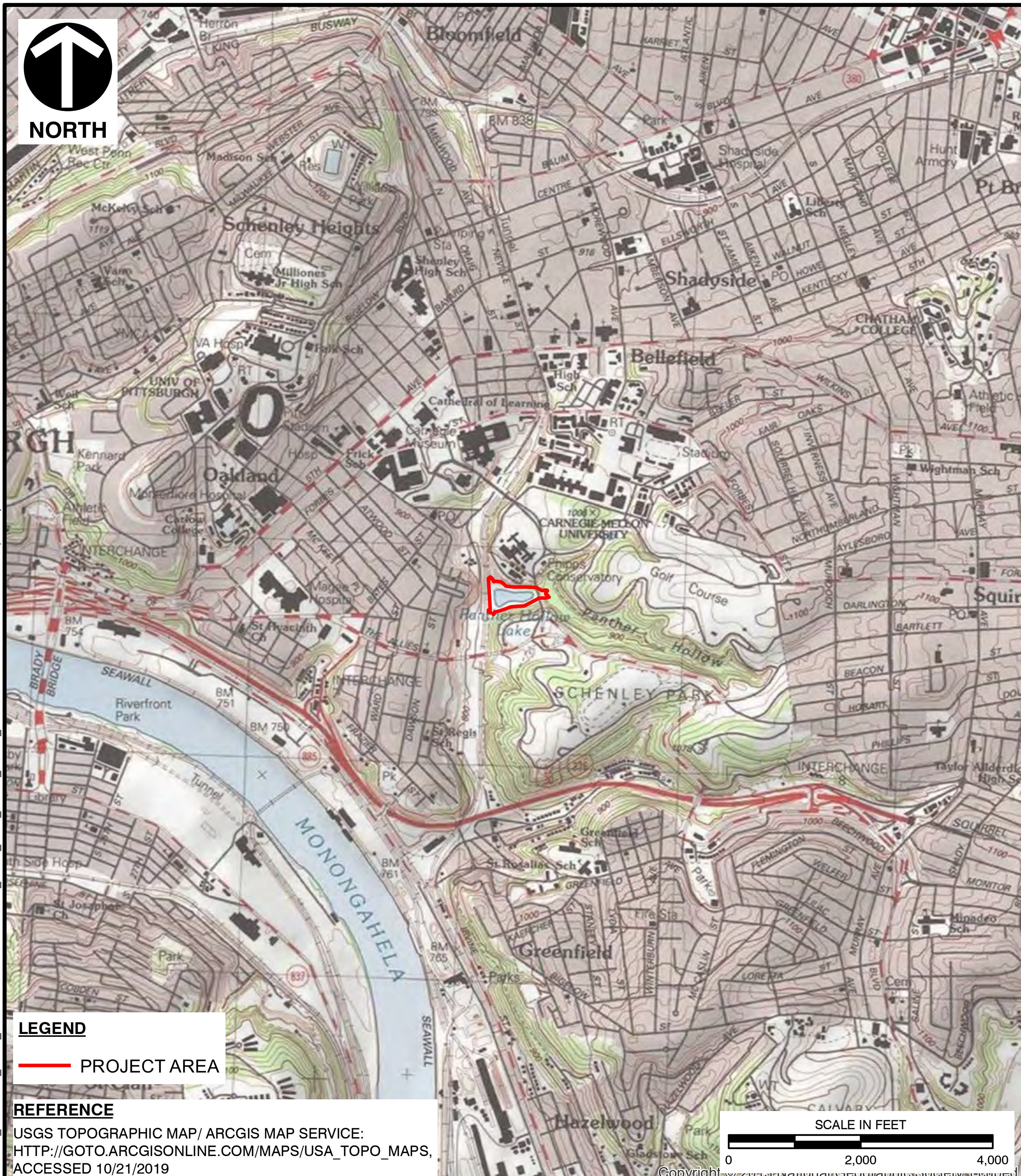

REFERENCE

USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE:
HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS,
ACCESSED 10/21/2019

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PITTSBURGH WATER & SEWER AUTHORITY
PANTHER HOLLOW LAKE
REHABILITATION PROJECT
ALLEGHENY COUNTY, PENNSYLVANIA

SITE LOCATION MAP

DRAWN BY: SML	CHECKED BY: MO	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO: 1
DATE: 10/21/2019	SCALE: 1 " = 2,000 '	PROJECT NO: 174-960	

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ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017; Accessed: 10/21/2019.

LEGEND

- PROJECT AREA
- SOIL MAP UNIT
- NWI WETLANDS

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ALLEGHENY COUNTY, PENNSYLVANIA

NWI WETLANDS AND SOILS MAP

DRAWN BY: SML	CHECKED BY: MO	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO: 2
DATE: 10/21/2019	SCALE: 1 " = 200 '	PROJECT NO: 174-960	

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REFERENCE

Esri, HERE, Garmin, (c) OpenStreetMap contributors.
Accessed: 10/21/2019.

ALLEGHENY COUNTY DIVISION OF COMPUTER SERVICES
GIS GROUP, ALLEGHENY COUNTY IMAGERY 2017.

LEGEND

- TEST SITE (TS)
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- PEM WETLAND
- PSS WETLAND
- LAKE
- PROEJCT AREA

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DELINEATION MAP

DRAWN BY: SML	CHECKED BY: MO	APPROVED BY: * Hand signature on file DRAFT	FIGURE NO:	3
DATE: 10/21/2019	SCALE: 1 " = 100 '	PROJECT NO: 174-960		

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WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: PITTSBURGH Sampling Date: MAY 25, 2018

Applicant/Owner: PWSA State: PA Sampling Point: TS-12

Investigator(s): KHG KKF Section, Township, Range: City of Pittsburgh

Landform (hillslope, terrace, etc.): EDGE OF LAKE Local relief (concave, convex, none): NONE Slope (%): 0%

Subregion (LRR or MLRA): LRR-N Lat: 40.437117 Long: -79.947227 Datum: NAD 83

Soil Map Unit Name: WATER (W) NWI classification PUBh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland? WETLAND-7 Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:
WETLAND IS LOCATED IN PANTHER HOLLOW LAKE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	
Water Table Present?	Yes X	No ___	Depth (inches): 3" BG	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): to surface	**Wetland Hydrology Present?** Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: TS- 12

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		= Total Cover	
Herb Stratum (Plot size: 5' RADIUS)			
1. TYPHA LATIFOLIA	30%	YES	OBL
2. IMPATIENS CAPENSIS	8%	No	FACW
3. LEERSIA ORYZOIDES	10%	No	FACW
4. BIDENS FRONDOSA	10%	No	FACW
5. CAREX STIPATA	2%	No	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60%	= Total Cover	
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ________ (A)

Total Number of Dominant Species Across All Strata: ________ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ________ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

Purple loosestrife and yellow IRIS PRESENT IN MOST PARTS OF THE WETLAND

SOIL

Sampling Point: TS-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR3/1	100%	—	—	—	—	SILT	FULLY SATURATED w/ REDUCED ORGANIC

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes X No ___

Remarks:

SOILS ARE FULLY SATURATED

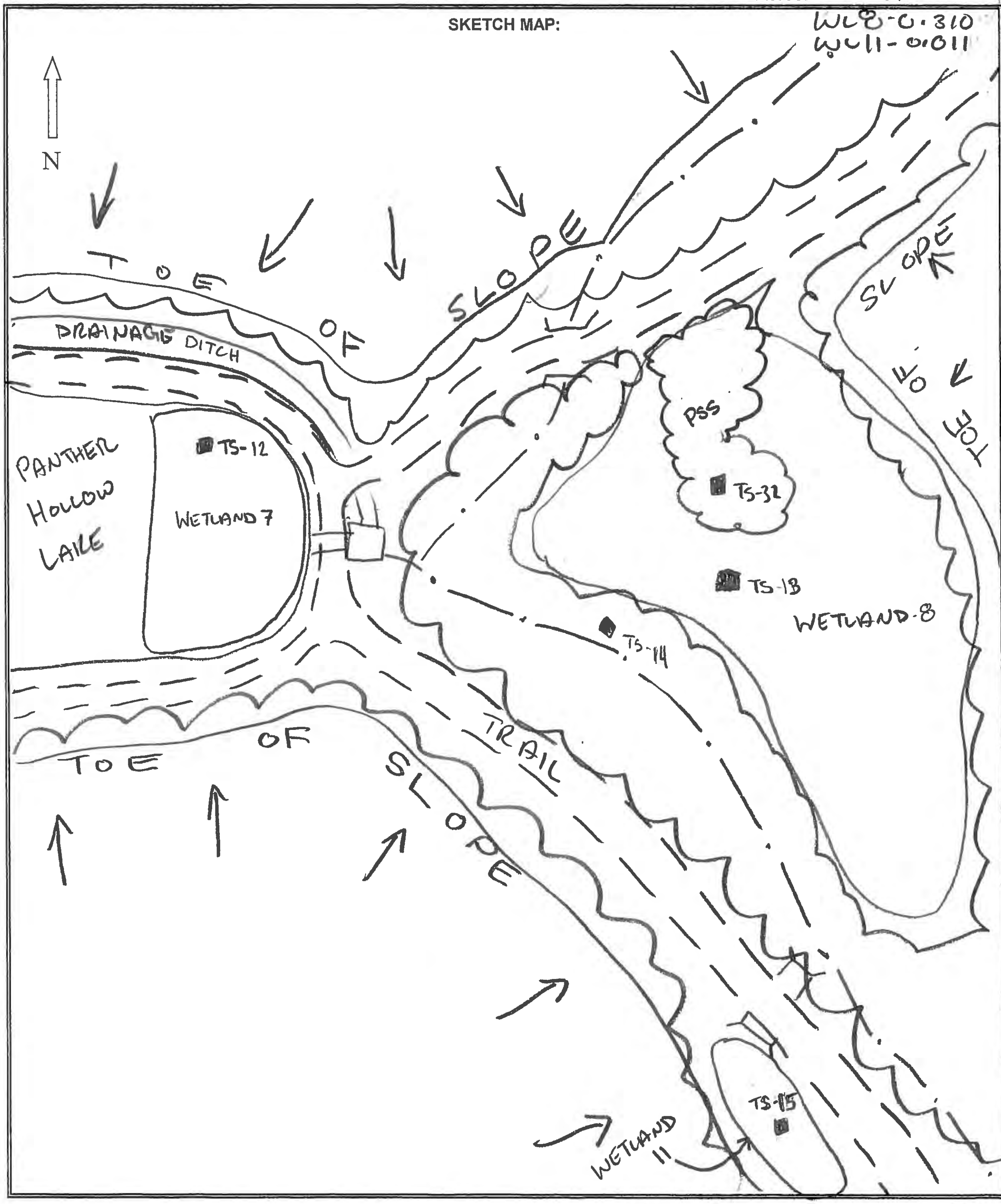
Project/Site: 174-960 Four Mile Run Daylighting

Wetland ID: Wetland 7, 8, + 11

Date: May 25, 2018

Acres: WL 7 0.292
WL 8 - 0.310
WL 11 - 0.011

SKETCH MAP:



Notes:

1. Show approximate size and shape of wetland boundaries, adjacent drainage features (streams, ponds, etc.), photograph view, test site location, adjacent reference features (buildings, roads, etc.).
2. Show approximate dimensions of major axes of wetland (i.e., length and width)

WETLAND FUNCTION FIELD INDICATORS - DATA FORM

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING
Wetland ID: WETLAND-7

Wetland Functions:			Notes/Observations:
Wildlife Habitat		nut bearing trees and shrubs (Table 1A)	
		plants with fleshy fruit (Table 1B)	
		plants with abundant edible seeds (Table 1C)	
	X	plants with edible fleshy roots, tubers, root stocks (Table 1D)	TYPHA
		aquatic vegetation beds (Table 1E)	
		forested or shrub wetland	
		vernal pool habitat (amphibian breeding)	
		headwater salamander habitat (rocky spring/seep)	
		standing snags >10" dbh w/cavities > 2" dia	
		trees >10" dbh	
		down woody debris >6" dbh	
		vegetated hummocks/tussocks	
		forest or shrub thicket bordering >50% wetland perimeter	
		native plants comprise >90% vegetative cover	
		moderate to high interspersion of plant communities	
		moderate to high vegetation - open water interspersion	
		habitat for rare or endangered species	
		live or standing dead trees with exfoliating bark	
	X	wildlife observations: RED WINGED BLACKBIRDS	
Flood Storage	X	located within an active floodplain	
		located within 100-year floodplain	
	X	located adjacent to a pond or lake	PANTHER HOLLOW LAKE
		wetland is relatively large and/or part of a large complex	
	X	vegetation is dense and deep rooted to slow floodwater	
	X	depressional topography	
		regulated or restricted outlet (inflow>>outflow)	
Discharge		seep or spring wetland	
		wetland contributes to stream flow	
		located within stream headwaters	
		located immediately below (downstream) of a dam, impoundment	
	X	permanent hydroperiod	
Recharge	X	depressional topography	
		have an inlet but no outlet	
	X	watershed soils have a slow infiltration rate or impervious	
		wetland along a loosing stream reach	
		groundwater slopes away from wetland	
Pollution Prevention		well-developed detrial/organic mat on soil surface	
		vegetatively diverse	
		vegetation consists of persisten, deep-rooted plants (willows, *Carex*)	
		wetland is relatively large and/or part of a large complex or mosaic	
	X	seasonal to permanent hydroperiod	
		permanent pool	
	X	depressional topography	
		restricted outlet (inflow>>outflow)	
	X	located upslope of a water body (river, stream, pond, lake, etc.)	PANTHER HOLLOW ROAD
	X	located downslope of a pollution source (road, crops, livestock, etc.)	URBAN DEVELOPMENT
	X	wetland visited during growing season	
Recreation/Study Area/Social Value		located within or adjacent to a park, refuge, gameland, etc.	
		used for hunting, trapping, fishing, hiking, boating, etc.	
		fish spawning or nursery area (water willow, SAV, fringe wetland)	
		connected with a stocked or wild game fish stream	
		habitat for rare or endangered species	
		exceptional value wetland	
		adjacent to a High Quality stream	
		located in watersheds with flooding or water quality problems	
		located in/near publically funded watershed improvement project	
		record of scientific study at this area	
		included in statewide listing of historical or archaeological sites	
		regionally rare or unique wetland/ecological or geological feature(s)	
		supports at least one USFWS National Species of Special Emphasis	
		used for timber production	

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 Four Mile Run Daylighting City/County: Pittsburgh Sampling Date: May 25, 2018

Applicant/Owner: PWSA State: PA Sampling Point: TS-13

Investigator(s): KHG KKF Section, Township, Range: City of Pittsburgh

Landform (hillslope, terrace, etc.): Flood Plain Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-N Lat: 40.436505 Long: -79.945665 Datum: NAD 83

Soil Map Unit Name: Urban Land (UB) NWI classification NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	Is the Sampled Area within a Wetland? Wetland-8 Yes X No

Remarks:
Wetland is located up stream of Panther Hollow Lake

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):

Water Table Present? Yes X No ___ Depth (inches): 4"BG

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): to Surface

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: TS-13

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' RADIUS)			
1. MALUS SP	3 %	NO	—
2. CORNUS AMOMUM	2 %	NO	FACW
3. FRAXINUS PENSYLVANICA	5 %	YES	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 % = Total Cover		
Herb Stratum (Plot size: 5' RADIUS)			
1. GLYCERIA STRIATA	30 %	YES	OBL
2. EQUISETUM ARVENSE	15 %	NO	FAC
3. IMPATIENS CAPENSIS	15 %	NO	FACW
4. LUDWIGIA ALTERNIFOLIA	10 %	NO	FACW
5. IRIS PSEUDACORUS	30 %	YES	OBL
6. RANUNCULUS HISPIDUS	20 %	YES	FAC
7. CAREX STIPATA	10 %	NO	OBL
8. EPILOBIUM SPP.	1 %	NO	—
9.			
10.			
11.			
12.			
	131 % = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

ALL TREES ROOTED OUTSIDE OF WETLAND

EPILOBIUM COULD NOT BE IDENTIFIED TO SPECIES DUE TO A LACK OF LEAVES.

MALUS COULD NOT BE IDENTIFIED TO SPECIES DUE TO HIGH LEVELS OF HYBRIDIZATION.

SOIL

Sampling Point: TS-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	92%	10YR 3/4	8%	C	PL	SiLo	VERY SATURATED

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: Pittsburgh Sampling Date: Aug 29, 2018
Applicant/Owner: PWSA State: PA Sampling Point: TS-32
Investigator(s): KHG MJO Section, Township, Range: City of Pittsburgh
Landform (hillslope, terrace, etc.): TOE OF SLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 0-1
Subregion (LRR or MLRA): LRR-N Lat: 40° 26' 13.59" N Long: 79°56' 46.63" W Datum: NAD83
Soil Map Unit Name: URBAN LAND (UB) NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation No, Soil No, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area within a Wetland?	WETLAND-8 PSS
Hydric Soil Present? Yes X No		Yes X No
Wetland Hydrology Present? Yes X No		

Remarks:
CAM A PHOTO 1-SE

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	
Water Table Present?	Yes X	No ___	Depth (inches):	11" BG
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	to surface

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: TS-32

Tree Stratum (Plot size: 30' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX BABYLONICA	15%	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15% = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. SALIX NIGRA	60%	YES	OBL
2. FRANGULA ALNUS	20%	NO	FAC
3. LIGUSTRUM VULGARE	20%	NO	FACU
4. LONICERIA MORROWII	3%	NO	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	103% = Total Cover		

Herb Stratum (Plot size: 5' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. GLYCERIA SP	40%	YES	FACW
2. IMPATIENS CAPENSIS	30%	YES	FACW
3. PELTANDRA VIRGINICA	2%	NO	OBL
4. EPILOBIUM COLORATUM	2%	NO	FACW
5. TOXICODENDRON RADIANS	1%	NO	FAC
6. RANUNCULUS Hispidus	15%	NO	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	90% = Total Cover		

Woody Vine Stratum (Plot size: 30' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. NONE			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

GLYCERIA WAS NOT IDENTIFIED TO SPECIES BUT IS ASSUMED TO BE FACW OR WETTER AS ALL SPECIES IN ALLEGHENY CO ARE FACW + WETTER.

SOIL

Sampling Point: TS-32

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
8"	—	—	—	—	—	—	—	ORGANIC
0-8	10YR 3/2	100%	—	—	—	—	SILT	Lots OF ORGANIC
8-14	10YR 2/1	100%	—	—	—	—	SDLo	EXTREMELY SATURATED
14-16	10YR 2/1	100%	—	—	—	—	Cl Lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:

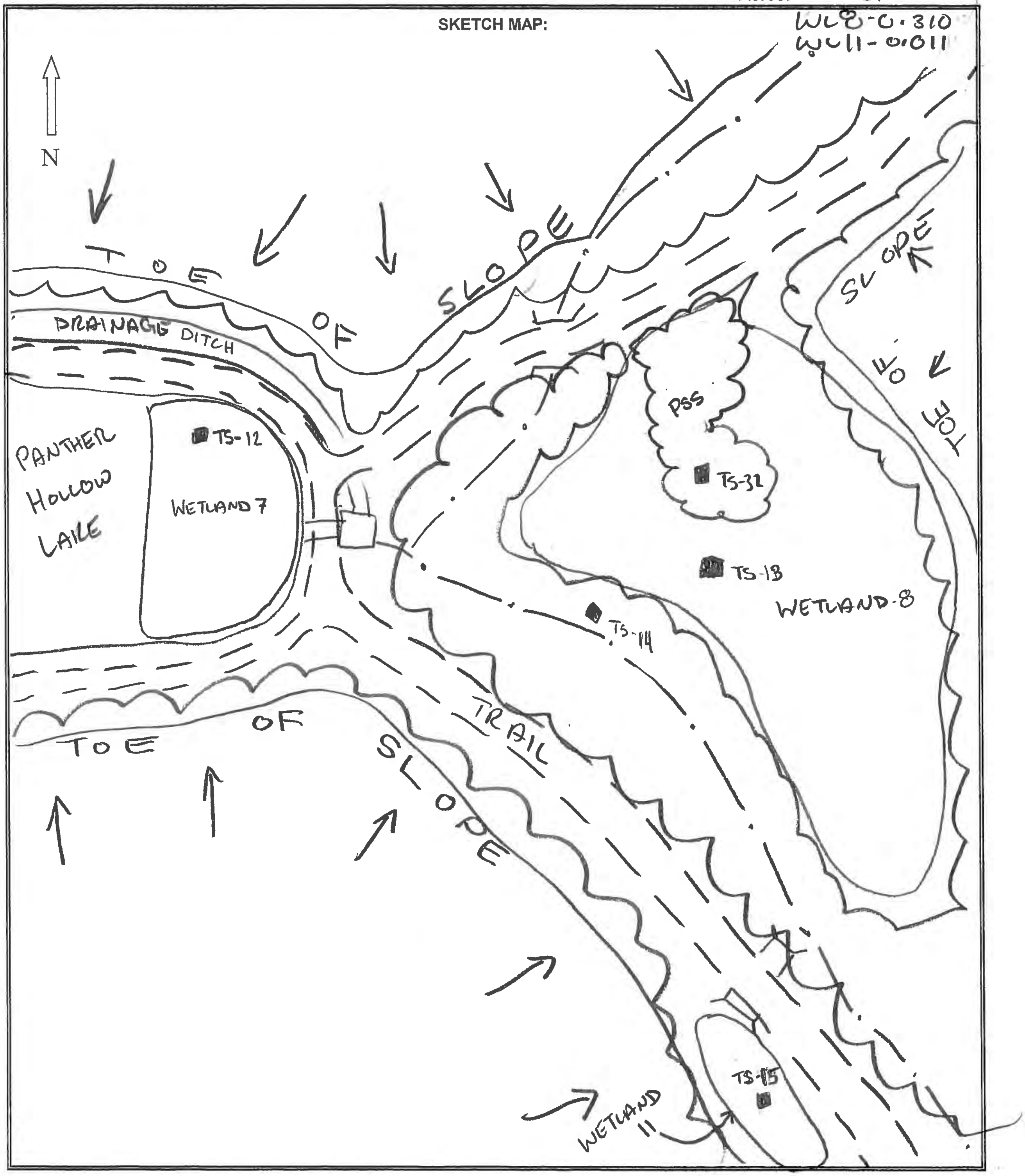
Project/Site: 174-960 Four Mile Run Daylighting

Wetland ID: Wetland 7, 8, & 11

Date: May 25, 2018

Acres: WL 7 0.292
WL 8 - 0.310
WL 11 - 0.011

SKETCH MAP:



Notes:

1. Show approximate size and shape of wetland boundaries, adjacent drainage features (streams, ponds, etc.), photograph view, test site location, adjacent reference features (buildings, roads, etc.).
2. Show approximate dimensions of major axes of wetland (i.e., length and width)

WETLAND FUNCTION FIELD INDICATORS - DATA FORM

Project/Site: 174-960 Four Mile Run Daylighting

Wetland ID: Wetland-8

Wetland Functions: | **Notes/Observations:**

Wetland Functions			Notes/Observations
Wildlife Habitat		nut bearing trees and shrubs (Table 1A)	
	X	plants with fleshy fruit (Table 1B)	Crab apple
	X	plants with abundant edible seeds (Table 1C)	Carex
	X	plants with edible fleshy roots, tubers, root stocks (Table 1D)	Iris
		aquatic vegetation beds (Table 1E)	
		forested or shrub wetland	
		vernal pool habitat (amphibian breeding)	
		headwater salamander habitat (rocky spring/seep)	
		standing snags >10" dbh w/cavities > 2" dia	
		trees >10" dbh	
		down woody debris >6" dbh	
		vegetated hummocks/tussocks	
	X	forest or shrub thicket bordering >50% wetland perimeter	
		native plants comprise >90% vegetative cover	
		moderate to high interspersion of plant communities	
		moderate to high vegetation - open water interspersion	
		habitat for rare or endangered species	
		live or standing dead trees with exfoliating bark	
		wildlife observations:	

Flood Storage	X	located within an active floodplain	
		located within 100-year floodplain	
		located adjacent to a pond or lake	
	X	wetland is relatively large and/or part of a large complex	
	X	vegetation is dense and deep rooted to slow floodwater	
		depressional topography	
	X	regulated or restricted outlet (inflow>>outflow)	

Discharge		seep or spring wetland	
		wetland contributes to stream flow	
		located within stream headwaters	
		located immediately below (downstream) of a dam, impoundment	
	X	permanent hydroperiod	

Recharge		depressional topography	
	X	have an inlet but no outlet	
		watershed soils have a slow infiltration rate or impervious	
		wetland along a loosing stream reach	
		groundwater slopes away from wetland	

Pollution Prevention		well-developed detrial/organic mat on soil surface	
		vegetatively diverse	
	X	vegetation consists of persisten, deep-rooted plants (willows, *Carex*)	
		wetland is relatively large and/or part of a large complex or mosaic	
	X	seasonal to permanent hydroperiod	
		permanent pool	
		depressional topography	
	X	restricted outlet (inflow>>outflow)	
	X	located upslope of a water body (river, stream, pond, lake, etc.)	Panther Hollow Lake
	X	located downslope of a pollution source (road, crops, livestock, etc.)	Urban Area
	X	wetland visited during growing season	

Recreation/Study Area/Social Value		located within or adjacent to a park, refuge, gameland, etc.	
		used for hunting, trapping, fishing, hiking, boating, etc.	
		fish spawning or nursery area (water willow, SAV, fringe wetland)	
		connected with a stocked or wild game fish stream	
		habitat for rare or endangered species	
		exceptional value wetland	
		adjacent to a High Quality stream	
		located in watersheds with flooding or water quality problems	
		located in/near publically funded watershed improvement project	
		record of scientific study at this area	
		included in statewide listing of historical or archaeological sites	
		regionally rare or unique wetland/ecological or geological feature(s)	
		supports at least one USFWS National Species of Special Emphasis	
		used for timber production	

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: 174-960 FOUR MILE RUN DAYLIGHTING City/County: PITTSBURGH Sampling Date: MAY 25, 2018

Applicant/Owner: PWSA State: PA Sampling Point: TS-14

Investigator(s): KHG KKF Section, Township, Range: CITY OF PITTSBURGH

Landform (hillslope, terrace, etc.): VALLEY Local relief (concave, convex, none): NONE Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-N Lat: 79° 56' 46.51" N Long: 40° 26' 12.85" Datum: NAD 83

Soil Map Unit Name: URBAN LAND (UB) NWI classification NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes ___ No X Wetland Hydrology Present? Yes X No	UPLAND TO WETLAND-7, 8, & 11 Is the Sampled Area within a Wetland? Yes ___ No X

Remarks:
TEST SITE IS LOCATED ADJACENT TO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):

Water Table Present? Yes ___ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): TO SURFACE

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: TS-19

Tree Stratum (Plot size: 30' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. ULMUS AMERICANA	30%	YES	FACW
2. MACLURA POMIFERA	30%	YES	UPL
3. MORUS SP	10%	NO	FACU
4.			
5.			
6.			
7.			
8.			
	70% = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. GLEDITSIA TRIACANTHOS	15%	YES	FAC
2. LIRIODENDRON TULIPIFERA	15%	YES	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30% = Total Cover		

Herb Stratum (Plot size: 5' RADIUS)	Absolute % Cover	Dominant Species?	Indicator Status
1. EQUISETUM ARVENSE	50%	YES	FAC
2. RANUNCULUS HISPIDUS	50%	YES	FAC
3. EUTHAMIA GRAMINIFOLIA	10%	NO	FAC
4. APOCYNUM CANNABINUM	5%	NO	FACU
5. CRYPTOTAENIA CANADENSIS	1%	NO	FAC
6. LYTHRUM SALICARIA	15%	NO	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	131% = Total Cover		

Woody Vine Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

- MORUS COULD NOT BE IDENTIFIED TO SPECIES DUE TO A LACK OF FRUIT BUT IS ASSUMED to BE FACU OR UPL + IS TREATED AS FACU FOR THE DOMINANCE TEST.

SOIL

Sampling Point: TS-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100%	—	—	—	—	SiLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Stream Survey Data Form

CEC Stream ID:	STREAM-10	Project:	174-960.001J
Date:	MAY 24, 2018	Investigator(s):	KKF, AxC, KHG

Channel Dimensions:		
Bank-to-bank width	10	ft
Est. Normal Pool Width	6	ft
Water depth	0.15	in
Bank height	0.4	ft
OHWM height	0.3	in

Channel Morphology:			
Meandering		Eroded/unstable banks	X
Riffles		Head-cutting	
Step-pool		Channelized / stabilized	
Alluvial bars / benches		Discontinuous channel	
Braided channels		Wetland fringe	X
Entrenched/incised		Origin within survey area	X

Hydrology:	
Perennial	X
Intermittent	
Ephemeral	

Flow:	
Dry	
Bed moist	
Standing water	
Flowing water	X
Ephemeral flow	

Source:	
Spring / seepage	X
Run-off	
Lake / pond	
Outflow / outfall	
Wetland	

Substrate (check >20%):			
Bedrock		Silt / sand	X
Boulder		Clay	
Cobble	✓	Detritus	
Gravel	X	Artificial	

Road crossing or other disturbance
- ☒ Bridge MULTIPLE BRIDGES
- ☐ Ford
- ☐ Culvert (Diameter: ______)
- ☐ Other:

Stream shading: ☒ 75 - 100% ☐ 50 - 74% ☐ 25 - 49% ☐ 0 - 24%

Water quality observations: ☒ water color is clear ☐ siltation ☐ discolored, oily film, scum, AMD, algal mat, odor, etc.

Ordinary High Water Marks (OHWM) as lateral limits:

- ☐ undercut banks
- ☐ alluvial vs. colluvial soils
- ☐ exposed roots
- ☒ vegetation matted down, bent, or absent
- ☒ leaf litter disturbed or washed away
- ☐ silt deposits
- ☐ water staining
- ☐ litter and debris along banks
- ☒ destruction of terrestrial vegetation
- ☒ drift or wrack
- ☒ sediment sorting
- ☐ erosion or scour
- ☐ observed high flow event
- ☐ abrupt change in plant community

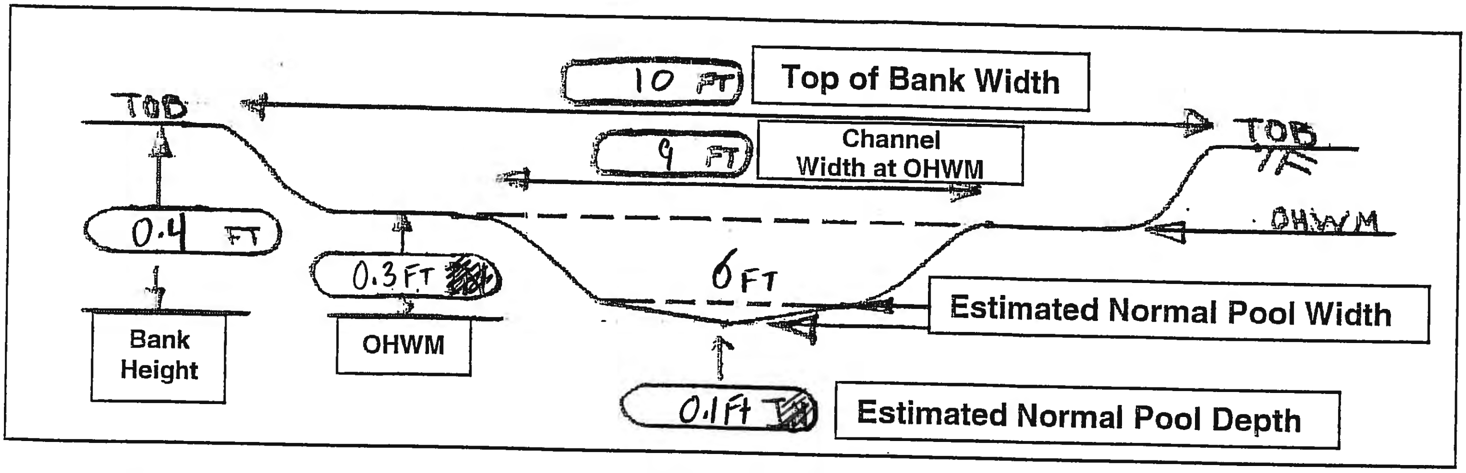
Aquatic Life: (Indicator: P - Perennial; I – Intermittent)

Organism		# or abundance	Organism		# or abundance
Fish	P		Crayfish (Decapoda)	P	
Salamander	P/I		Aquatic sowbugs (Isopoda)	I	
Freshwater mussels	P/I		Aquatic beetles (Coleoptera)	P	
Clams	P/I		Water bugs (Gerro/Nepomorpha)	P	
Mayfly (Ephemeroptera)	P		Water pennies (Psephenidae)	P	
Stonefly (Plecoptera)	P	X	Leeches (Hirudinea)	I	
Caddisfly (Tricoptera)	P	X	Segmented worms (Oligochaeta)	I	
Dragonfly/ Damselfly (Odonata)	P		Flatworms (Platyhelminthes)	I	X
Alderfly/Dobsonfly (Megaloptera)	P		Periphyton	P	
Cranefly (Tipulidae)	P		Aquatic vegetation	P	
Scud (Amphipoda)	I	X	Whirligig beetles (Gyrinidae)	I	
Black fly (Simulidae)	I		Other:		
Midge (Chironomidae)	P/I				

None observed. Circle one: absent, dry, non-wadeable, or lacking suitable habitat/substrate

CEC Stream ID:	STREAM 10	Project:	174-960.001J

Record cross-sectional measurements below:



Photographs (upstream, downstream, overview at crossing):

#	Description	Facing
	PLEASE SEE PHOTO LOG	

PA-WV format 2/2016

Notes:

UPPER PORTION OF PANTHER HOLLOW RUN

Stream Survey Data Form

CEC Stream ID:	STREAM 22	Project:	174-960.001J
Date:	MAY 25, 2018	Investigator(s):	KKF KHG

Channel Dimensions:		
Bank-to-bank width	18	ft
Est. Normal Pool Width	1.5	ft
Water depth	0.3 FT	in
Bank height	1.5	ft
OHWM height	FT	in

Channel Morphology:			
Meandering		Eroded/unstable banks	X
Riffles		Head-cutting	X
Step-pool		Channelized / stabilized	
Alluvial bars / benches		Discontinuous channel	
Braided channels		Wetland fringe	
Entrenched/incised		Origin within survey area	X

Hydrology:	
Perennial	X
Intermittent	
Ephemeral	

Flow:	
Dry	
Bed moist	
Standing water	
Flowing water	X
Ephemeral flow	

Source:	
Spring / seepage	
Run-off	
Lake / pond	
Outflow / outfall	X
Wetland	

Substrate (check >20%):			
Bedrock	X	Silt / sand	
Boulder	X	Clay	
Cobble	X	Detritus	
Gravel		Artificial	

Road crossing or other disturbance

- ☒ Bridge
- ☐ Ford
- ☐ Culvert (Diameter: ______)
- ☐ Other:

Stream shading: ☒ 75 - 100% ☐ 50 - 74% ☐ 25 - 49% ☐ 0 - 24%

Water quality observations: ☒ water color is clear ☒ siltation MILD ☐ discolored, oily film, scum, AMD, algal mat, odor, etc.

Ordinary High Water Marks (OHWM) as lateral limits:

- ☐ undercut banks
- ☐ alluvial vs. colluvial soils
- ☐ exposed roots
- ☒ vegetation matted down, bent, or absent
- ☒ leaf litter disturbed or washed away
- ☐ silt deposits
- ☐ water staining
- ☐ litter and debris along banks
- ☒ destruction of terrestrial vegetation
- ☒ drift or wrack
- ☒ sediment sorting
- ☐ erosion or scour
- ☐ observed high flow event
- ☐ abrupt change in plant community

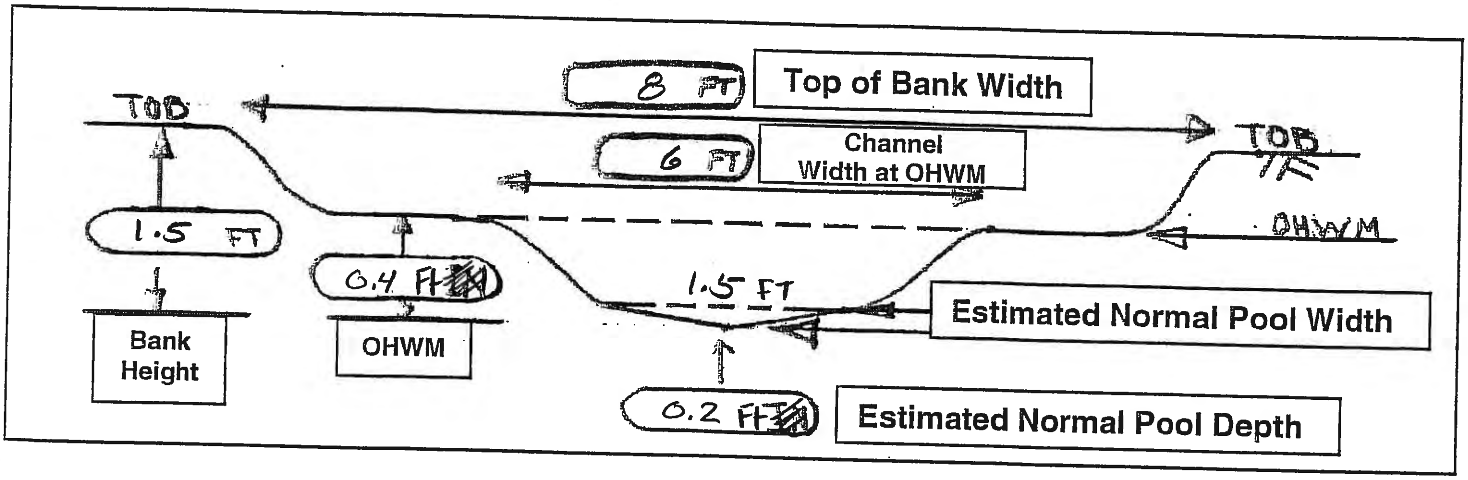
Aquatic Life: (Indicator: P - Perennial; I – Intermittent)

Organism		# or abundance	Organism		# or abundance
Fish	P		Crayfish (Decapoda)	P	
Salamander	P/I		Aquatic sowbugs (Isopoda)	I	
Freshwater mussels	P/I		Aquatic beetles (Coleoptera)	P	
Clams	P/I		Water bugs (Gerro/Nepomorpha)	P	
Mayfly (Ephemeroptera)	P		Water pennies (Psephenidae)	P	
Stonefly (Plecoptera)	P		Leeches (Hirudinea)	I	
Caddisfly (Tricoptera)	P	X	Segmented worms (Oligochaeta)	I	
Dragonfly/ Damselfly (Odonata)	P		Flatworms (Platyhelminthes)	I	
Alderfly/Dobsonfly (Megaloptera)	P		Periphyton	P	
Cranefly (Tipulidae)	P		Aquatic vegetation	P	
Scud (Amphipoda)	I		Whirligig beetles (Gyrinidae)	I	
Black fly (Simulidae)	I		Other:		
Midge (Chironomidae)	P/I				

None observed. Circle one: absent, dry, non-wadeable, or lacking suitable habitat/substrate

CEC Stream ID:	STREAM 22	Project:	174-960.001J

Record cross-sectional measurements below:



Photographs (upstream, downstream, overview at crossing):

#	Description	Facing
	PLEASE SEE PHOTO LOG	

PA-WV format 2/2016

Notes:

FLOWS INTO STREAM 10

PANTHER HOLLOW LAKE REHABILITATION PROJECT
PWSA

Photo 1: TS-12 in Wetland 7
May 25, 2018

Photo 2: TS-13 in Wetland 8 (PEM)
May 25, 2018

Photo 3: TS-32 in Wetland 8 (PSS)
August 29, 2018

Photo 4: TS-14 Upland Reference Site for Wetlands 7 & 8
May 25, 2018

Photo 5: Panther Hollow Run facing upstream
October 21, 2019

Photo 6: Panther Hollow Run facing downstream
October 21, 2019

Photo 7: Phipps Run facing upstream
May 24, 2018

Photo 8: Phipps Run facing downstream at confluence with Panther Hollow Run
May 24, 2018

Photo 9: Wetland 7 edge at Panther Hollow Lake
May 24, 2018

APPENDIX B

AGENCY COORDINATION

1. PROJECT INFORMATION

Project Name: **Panther Hollow Lake Dam Safety Permit**
Date of Review: **10/4/2019 03:21:31 PM**
Project Category: **Recreation, Ponds/Lakes: construction or expansion**
Project Area: **11.41 acres**
County(s): **Allegheny**
Township/Municipality(s): **PITTSBURGH**
ZIP Code: **15213; 15217**
Quadrangle Name(s): **PITTSBURGH EAST**
Watersheds HUC 8: **Lower Monongahela**
Watersheds HUC 12: **Streets Run-Monongahela River**
Decimal Degrees: **40.436683, -79.946607**
Degrees Minutes Seconds: **40° 26' 12.585" N, 79° 56' 47.7863" W**

This is a draft receipt for information only. It has not been submitted to jurisdictional agencies for review.

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Panther Hollow Lake Dam Safety Permit

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Panther Hollow Lake Dam Safety Permit

Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

RESPONSE TO QUESTION(S) ASKED

Q1: Will the entire project area (including any discharge), plus a 300 feet buffer around the project area, all occur in or on an existing building, parking lot, driveway, road, road shoulder, street, runway, paved area, railroad bed, maintained (periodically mown) lawn, crop agriculture field or maintained orchard?
Your answer is: No

Q2: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q3: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: https://conservationexplorer.dcnr.pa.gov/content/survey-protocols)

Scientific Name	Common Name	Current Status	Proposed Status	Survey Window
Ptelea trifoliata	Common Hop-tree	Threatened	Threatened	Flowers late May - early June; fruits July - September

PA Fish and Boat Commission
RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service
RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).
***Note:** U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

November 13, 2018

Kristen Janowski
AWK Consulting Engineers, Inc.
806 S. 28th Street
Harrisburg PA 17111

ER 2019-0203-003-A: COE, Four Mile Run Green Infrastructure Project, Pittsburgh, Allegheny County

Dear Ms. Janowski,

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution, and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Archaeological Resources

Previously recorded archaeological sites, listed below, are located within or adjacent to your project area. These resources could be adversely affected by project activities and have not been evaluated for their eligibility for listing on the National Register of Historic Places. It is our opinion that a Phase I archaeological survey to relocate these known sites and locate other potentially significant sites within the project area should be conducted. Guidelines and instructions for conducting all phases of archaeological survey in Pennsylvania are available on our website http://www.phmc.pa.gov/Preservation/About/Documents/SHPO-Guidelines-Archaeological-Investigation.pdf.

P.A.S.S. # 36AL152

The PASHPO will keep the information you provided for this submission and any subsequent submission on file. Please provide a copy of this letter and any other project-related correspondence to your state or federal permitting or funding agency.

Above Ground Resources
Potential Effects
It is our understanding that the project is still being planned and evolving based upon a number of factors.

Schenley Park – More Information
As the National Register of Historic Places listed Schenley Park, Key # 009350 is within the project's area of potential effect (APE) and the project has the potential to affect the resource, we are requesting additional information.

Update mapping and list to reflect contributing resources
Provide narrative of potential effects
Please note that there some resources that have been determined individually not eligible for the NRHP, but have been determined to be contributing to the Schenley Park historic district, thus are eligible for the NRHP (for example, Panther Hollow Bridge, WPA bridges, tufa bridges, etc.).

Please note that the NRHP nomination states that there are twenty-five individual contributing elements…they are primarily buildings, bridges and sculpture, but a lake and a golf course and the park's stonework and landscaping have also been considered to be contributing elements.

Please update the "additional previously document properties list" to reflect contributing status, provide mapping of the contributing resources, and a narrative regarding the potential for effect on these resources – for example – removal of a WPA bridge or landscape feature.

Potential Consulting Parties
As the project has the potential to affect historic resources, and is a federal undertaking, please provide the names/entities that have been invited to be consulting parties for this Section 106 project.

The PA SHPO is providing the following entities for consideration of consulting party status, please note there may be others that should be identified and invited.

Friends of Panther Hollow Lake
http://friendsofpantherhollowlake.blogspot.com/2015/04/schenley-park-now-you-see-it-now-you.html

Pittsburgh Parks Concervancy
https://www.pittsburghparks.org/

Oakmont Historical Society Museum
http://www.oakmonthistoricalsociety.org/boardcontact-us.html

Pittsburgh History and Landmarks Foundation
phlf.org/

Preservation Pittsburgh
preservationpittsburgh.org/

Young Preservationists Association of Pittsburgh
www.youngpreservationists.org/

If you need further information regarding archaeological resources, please contact Steven McDougal at smcdougal@pa.gov or (717) 772-0923. If you need further information concerning above ground resources, please contact Cheryl Nagle at chnagle@pa.gov or (717) 772-4519.

Sincerely,

Douglas C. McLearen, Chief
Division of Environmental Review

From: Zug, Linda
To: Pearson, Ingrid
Subject: FW: 4MR WDR (UNCLASSIFIED)
Date: Thursday, January 03, 2019 8:59:55 AM

Linda S. Zug / Project Manager
Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205-1751
Toll-Free: 800-365-2324 · Direct: 412-249-1627 · Fax: 412-429-2114
CELL # 412-925-5701
http://www.cecinc.com
Senior Leadership · Integrated Services · Personal Business Relationships

-----Original Message-----
From: Engelhardt, Michael D CIV USARMY CELRP (US) [mailto:Michael.D.Engelhardt@usace.army.mil]
Sent: Friday, November 23, 2018 1:52 PM
To: Zug, Linda
Subject: RE: 4MR WDR (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

I concur with the Wetland and Stream Delineation Report you have provided for the 4 Mile Run project. Please let me know if you need anything else going forward.

Mike Engelhardt
Regulatory Division
U.S. Army Corps of Engineers - Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222
(412) 395-7141 (Office)
(412) 667-1638 (Cell)

-----Original Message-----
From: Zug, Linda [mailto:lzug@cecinc.com]
Sent: Tuesday, October 30, 2018 4:31 PM
To: Engelhardt, Michael D CIV USARMY CELRP (US) <Michael.D.Engelhardt@usace.army.mil>
Subject: [Non-DoD Source] 4MR WDR

Blockedhttp://www.cecinc.com/clients/download/174-960 4MR/WDR

The updated WDR for 4MR is included in the link - let me know if you need anything else at this time - Happy Halloween!

Linda S. Zug / Project Manager
Civil & Environmental Consultants, Inc.
333 Baldwin Road * Pittsburgh, PA 15205-1751
Toll-Free: 800-365-2324 * Direct: 412-249-1627 * Fax: 412-429-2114 CELL # 412-925-5701
Blockedhttp://www.cecinc.com Senior Leadership * Integrated Services * Personal Business Relationships

-----Original Message-----

From: Engelhardt, Michael D CIV USARMY CELRP (US) [mailto:Michael.D.Engelhardt@usace.army.mil]
Sent: Tuesday, October 16, 2018 10:25 AM
To: Zug, Linda
Subject: RE: Nationwide Permits? (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Yes. Send the updated documents so that I can process the PJD.

I'll block the 14th and 15th off. Run those past the group to see what works best, and let me know.

Mike Engelhardt
Regulatory Division
U.S. Army Corps of Engineers - Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222
(412) 395-7141 (Office)
(412) 667-1638 (Cell)

-----Original Message-----
From: Zug, Linda [mailto:lzug@cecinc.com]
Sent: Tuesday, October 16, 2018 8:37 AM
To: Engelhardt, Michael D CIV USARMY CELRP (US) <Michael.D.Engelhardt@usace.army.mil>
Subject: [Non-DoD Source] RE: Nationwide Permits? (UNCLASSIFIED)

We can get you those - no problem, if you took a map, then you have the updated wetland on it, but we can send the updated report and forms.

14 and 15 look good

Linda S. Zug / Project Manager
Civil & Environmental Consultants, Inc.
333 Baldwin Road * Pittsburgh, PA 15205-1751
Toll-Free: 800-365-2324 * Direct: 412-249-1627 * Fax: 412-429-2114 CELL # 412-925-5701
BlockedBlockedhttp://www.cecinc.com Senior Leadership * Integrated Services * Personal Business Relationships

-----Original Message-----
From: Engelhardt, Michael D CIV USARMY CELRP (US) [mailto:Michael.D.Engelhardt@usace.army.mil]
Sent: Tuesday, October 16, 2018 7:17 AM
To: Zug, Linda
Subject: RE: Nationwide Permits? (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

A project can use a number of NWP's for an authorization, though for a project of this magnitude, using the IP would probably be much more efficient and "cleaner" in the end.

To finalize the PJD, I'll need the documents with the revisions that were requested during the first field view.

Woods Run will likely have to wait until mid-November. Do you have any availability 11/14-11/16?

Mike Engelhardt
Regulatory Division

U.S. Army Corps of Engineers - Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222
(412) 395-7141 (Office)
(412) 667-1638 (Cell)

-----Original Message-----
From: Zug, Linda [mailto:lzug@cecinc.com]
Sent: Monday, October 15, 2018 9:47 AM
To: Engelhardt, Michael D CIV USARMY CELRP (US) <Michael.D.Engelhardt@usace.army.mil>
Subject: [Non-DoD Source] Nationwide Permits?

I finally had a chance to look up a NWP-4 and I don't think this will fit our project. However, Can a project use a number of NWPs? Like for this PWSA project, could we maybe use NWP-7, NWP-27, and maybe NWP-43? May not cover all the design and mitigation/impacts though ...

Just a few thoughts from our field view last week.

What do you need from us to finalize the PJD? Thanx Mike!

Also - let me know about scheduling the PJD for Woods Run. Thanx.

"Don't cry because it's over, smile because it happened."

- Dr Seuss, American author (1904-1991).

Linda S. Zug / Project Manager

Civil & Environmental Consultants, Inc.

333 Baldwin Road * Pittsburgh, PA 15205-1751

Toll-Free: 800-365-2324 * Direct: 412-249-1627 * Fax: 412-429-2114

CELL # 412-925-5701

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CLASSIFICATION: UNCLASSIFIED

CLASSIFICATION: UNCLASSIFIED

CLASSIFICATION: UNCLASSIFIED

APPENDIX C

PA LEVEL 2 RAPID ASSESSMENT PROTOCOL ASSESSMENT FORMS

2/4/2017

Lacustrine Condition Assessment Form

Pennsylvania Lacustrine Condition Level 2 Rapid Assessment (Document No. 310-2137-004)

Pennsylvania Department of Environmental Protection

For use in lakes, reservoirs, and non-wadeable rivers found within Pennsylvania.

Project #	Project Name	Date	Impact Size		AA #	AA SIZE	
174-960	Four Mile Run Green Stormwater Infrastructure Project	05.30.2018	2.1		AA-PanLake		

Name(s) of Evaluator(s)			Lat (dd)	Long (dd)				
A.McLaughlin	I. Pearson		40° 26' 12.88" N	79° 56' 53.59" W				

1. Average Depth Condition Index

	Condition Category					
	Optimal		Suboptimal	Marginal	Poor	
Average Depth of Impact Area	**High Optimal:** Depth of the AA is greater than 0 and less than or equal to 6 feet in depth on average.*	**Low Optimal:** Depth of the AA is greater than 6 and less than or equal to 10 feet in depth on average.	Depth of the AA is greater than 10 and less than or equal to 15 feet in depth on average.	Depth of the AA is greater than 15 and less than or equal to 20 feet in depth on average.	Depth of the AA is greater than 20 feet in depth on average.	CI= Total Score/20
SCORE	20 19 18	17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1	0.95

Score: 19

* Special aquatic habitats such as mud flats, submerged aquatic vegetation beds, emergent wetlands (occurring within the defined limits of the lacustrine resources) are scored optimally regardless of depth conditions.

** The average depth is determined by taking a minimum of five measurements along a line that runs the width of the entire AA (parallel to the shoreline), midway between the shoreline and the outer boundary of the AA. Note: The condition category can be raised one level if below High Optimal when habitat complexity is present as described in Section 2.0 narrative .

Comments: The lake has been filled in with sediment over the past few decades, this has resulted in average depths of between 3 and 4.5 feet.

2. Riparian Shoreline Vegetation Condition Index

	Condition Category							
	Optimal	Suboptimal		Marginal		Poor		
Riparian Shoreline Vegetation (from water's edge to 50 ft. inland)	Riparian area vegetation consists of a tree stratum (diameter at breast height (dbh) > 3 inches) present, with greater than or equal to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh >3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh >3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with maintained understory.	**High Marginal:** Riparian area vegetation consists of a non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh >3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** Riparian area vegetation consists of a non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum and areas of hay production, and ponds or open water areas (< 10 acres)present. If tree stratum (dbh >3 inches) present, less than 30% tree canopy cover with maintained understory.	**High Poor**: Riparian area consists of lawns, mowed and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Riparian area consists of impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	CI= Total Score/20
SCORE ___	20 19 18 17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1	

1. Identify all applicable Condition Category areas within the riparian shoreline area using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Shoreline Area in decimal form (0.00) and Score for each category in the blocks below.

Total Score = SUM(%Areas*Scores)

	Condition Category:	High Poor	Low Poor	Optimal					
Scoring:	% Area:	95%	4%	1%	0%	0%	0%	Total Sub-Scores:	
	Score:	5	2	20	0	0	0		
	Sub-score:	4.75	0.08	0.20	0.00	0.00	0.00	5.03	0.25

Comments: The riparian shoreline vegetation consists of maintained lawns, one wetland, and trails.

Lacustrine Condition Assessment Form

Pennsylvania Lacustrine Condition Level 2 Rapid Assessment (Document No. 310-2137-004)

Pennsylvania Department of Environmental Protection

For use in lakes, reservoirs, and non-wadeable rivers found within Pennsylvania.

3. Riparian Zone of Influence (ZOI) Vegetation Condition Index

	Condition Category							
	Optimal	**Suboptimal**		**Marginal**		**Poor**		
Riparian Zone of Influence (from 50-100 feet inland)	Riparian ZOI vegetation consists of a tree stratum (diameter at breast height (dbh) > 3 inches) present, with greater than or equal to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian ZOI vegetation consists of a tree stratum (dbh >3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian ZOI vegetation consists of a tree stratum (dbh >3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with maintained understory.	**High Marginal:** Riparian ZOI vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh >3 inches) present, with less than or equal to 30% tree canopy cover.	**Low Marginal:** Riparian ZOI vegetation consists of a non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum and areas of hay production, and ponds or open water areas (< 10 acres)present. If tree stratum (dbh >3 inches) present, less than 30% tree canopy cover with maintained understory.	**High Poor:** Riparian ZOI vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Riparian ZOI vegetation consists of impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	**CI= Total Score/20**
SCORE ___	**20 19 18 17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3**	**2 1**	

1. Identify all applicable Condition Category areas within the riparian ZOI using the descriptors above.
2. Estimate the % area within each condition category. Calculators are provided for you below.
3. Enter the % ZOI Area in decimal form (0.00) and Score for each category in the blocks below.

Total Score = SUM(%Areas*Scores)

	Condition Category:	Low Suboptimal	High Poor	Optimal				**Total Sub-Scores:**
Scoring:	% ZOI Area:	75%	24%	1%	**0%**	**0%**	**0%**	
	Score:	12	5	20	**0**	**0**	**0**	
	Sub-score:	**9.00**	**1.20**	**0.20**	**0.00**	**0.00**	**0.00**	**10.40**

CI: 0.52

Comments: This zone consists of steep wooded slopes with an absent understory, maintained lawns, one emergent wetland, and trails.

4. Shoreline and Near-shore Human Alterations Index

	Condition Category								
	Optimal		**Suboptimal**		**Marginal**		**Poor**		
Shoreline and Near-shore Human Alterations Index	**High Optimal:** No man-made structures, roads or other disturbances within 50 feet or along the lacustrine shoreline.	**Low Optimal:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine shoreline occupying less than 10% of the shoreline.	**High Suboptimal:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine shoreline occupying greater than or equal to 10% but less than 25% of the shoreline.	**Low Suboptimal:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine shoreline occupying greater than or equal to 25% but less than 40% of the shoreline.	**High Marginal:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine shoreline occupying greater than or equal to 40% but less than 55% of the shoreline.	**Low Marginal:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine shoreline occupying greater than or equal to 55% but less than 70% of the shoreline.	**High Poor:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine (shoreline) occupying greater than or equal to 70% but less than 85% of the shoreline.	**Low Poor:** Man-made structures, roads or other disturbances within 50 feet or along the lacustrine (shoreline) occupying greater than or equal to 85% of the shoreline.	**CI= Total Score/20**
SCORE	**20 19 18**	**17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3**	**2 1**	**0.15**

Comments: This zone consists of maintained lawns, one emergent wetland, and trails.

Score	3

Overall Lacustrine Level 2 Condition Score: Sum all four of the Condition Indexes and divide by 4 to calculate the overall condition score (value between 0.05 and 1.0).	**Overall Condition Index:**	**0.47**

General Comments:

Riverine Assessment Form 1

Pennsylvania Riverine Condition Level 2 Rapid Assessment Protocol (Document No. 310-2137-003)

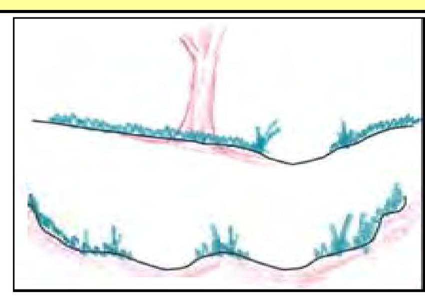
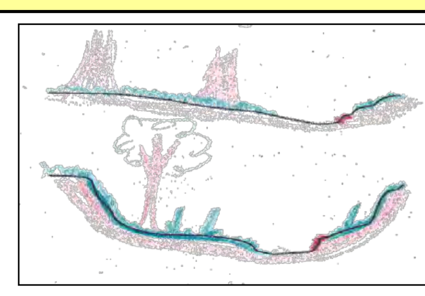
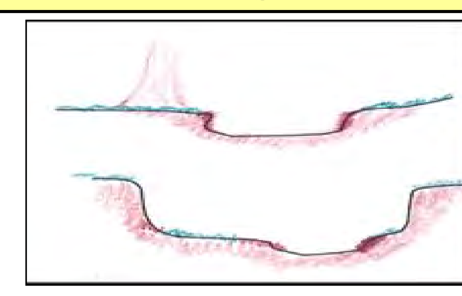
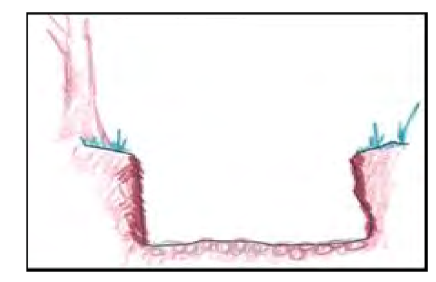
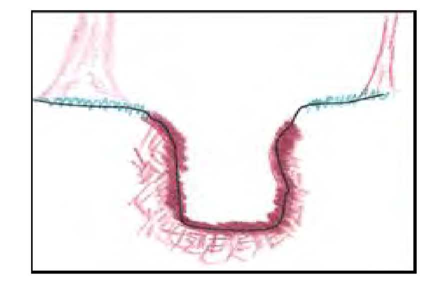
Pennsylvania Department of Environmental Protection

For use in intermittent or perennial watercourses with drainage areas ≤ 2,000 square mile drainage areas.

Project #	Project Name	Locality	Date	Ch 93 Classification		AA Id	Length
174-960	Four Mile Run Green Stormwater Infrastructure Project	City of Pittsburgh	05.24.2018	Designated: WWF	Existing: None	Riverine AA 10-4	428
Latitude	40°26'13.78"N	**Longitude**	79°56'50.63"W	**FGM Level 1 Channel Classification**			

Evaluator(s)	Stream Name and Information	Notes:
KKF KHG	Stream 10 (4 Mile Run/Panther Hollow Run)	This form represents the dowstream portion of Stream 10 located from Panther Hollow Lake to 100 feet beyond the proposed limit of disturbance.

1. CHANNEL/FLOODPLAIN: Assess the cross-section of the stream and prevailing conditions along the AA.

	Condition Category				
	Optimal	**Suboptimal**	**Marginal**	**Poor**	**Severe**
					
Channel / Floodplain	**Channel Geometry:** These channels show very little incision or widening and little or no evidence of active erosion. Anastomosing channels may be present. **Channel Stability:** Visual indicators include: 1) the banks are not eroding along greater than 5% of the reach; 2) natural vegetative or rock stability features are present along greater than 80% of the banks; 2) stable point bars and bankfull benches may be present; 3) mid-channel bars and transverse bars are rare and if transient channel sediment deposition is present, it covers less than or equal to 10% of the stream bottom; 4) baseflow is connected to the rooting depths of vegetation in the active floodplain. **Active Floodplain Connection:** The bankfull stream flows have frequent access to the active floodplain and fully developed point bars or bankfull benches that are accessed at most flows greater than baseflow.	**Channel Geometry:** These channels are slightly incised or overwidened and contain a few areas of active erosion. **Channel Stability:** Visual indicators include: 1) the banks are actively eroding along less than 25% of the reach; 2) depositional features such as point bars and bankfull benches are present and stable during high flows and occur along greater than 50% of the reach; 3) natural bank protection like vegetation or rock is providing stability along greater than 50% of the reach; 4) baseflow is connected to vegetated point bars and bankfull benches. **Active Floodplain Connection:** The bankfull stream flows frequently access bankfull benches, or point bars along portions of the reach and may frequently inundate the active floodplain.	**Channel Geometry:** These channels are over-widened or incised, but to a lesser degree than the Severe and Poor channel conditions. **Channel Stability:** Visual indicators include: 1) the banks are eroding or severely undercut along greater than 25% and less than or equal to 50% of the reach; 2) depositional features like point bars or bankfull benches occur along greater than 25% and less than or equal to 50% of the reach; 3) the stream banks may consist of some vertical or undercut banks or nick points associated with head cuts; **Active Floodplain Connection:** The bankfull stream flows have infrequent connection to the active floodplain.	**Channel Geometry:** These channels are over-widened or incised and eroding vertically and/or laterally. **Channel Stability:** Visual indicators include: 1) the banks are eroding or severely undercut along greater than 50% of the reach; 2) active or recent bank sloughing is present along greater than 50% of the reach; 3) natural bank protection like vegetation is not preventing bank erosion along the reach; 4) depositional features, such as point bars and bank full benches, are absent from the reach or newly developing along less than 25% of the reach; 5) bank full benches and point bars frequently scour during high flows; 6) baseflow is disconnected from plant rooting depths and the active floodplain. **Active Floodplain Connection:** The bankfull stream flows are not connected to the active floodplain.	**Channel Geometry:** These channels are deeply incised and actively eroding vertically and/or laterally. Over widened channels may contain sections of unstable braided channels from aggradation. **Channel Stability:** Visual indicators include: 1) the banks are actively eroding or being undercut along greater than 80% of the reach; 2) active or recent bank sloughing is occurring along greater than 80% of the reach; 3) natural bank protection like vegetation is not preventing bank erosion or sloughing; 4) depositional features such as point bars and bankfull benches are absent; 5) flood flows are disconnected from the active floodplain. **Active Floodplain Connection:** The bankfull stream flows are never connected to the active floodplain.
SCORE	20 19 18 17	16 15 14 13	12 11 10 9	8 7 6 5	4 3 2 1

Comments:
The stream is connected to the floodplain.

CI = (Score)/20		CI
SCORE	12	0.60

2. RIPARIAN VEGETATION: Assess the floodplain along the entire AA (Visual estimates of areal coverage from aerial photos with field verification acceptable).

	Condition Category						
	Optimal	**Suboptimal**		**Marginal**		**Poor**	
Riparian Vegetation (Floodplain)	Riparian area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** Riparian area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** Riparian area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** Riparian area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Riparian area consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.
		High	**Low**	**High**	**Low**	**High**	**Low**
SCORE	20 19 18 17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1

Comments:

Right Descending Bank
Canopy cover is over 60% for the wooded area within the AA.
Wetlands are present.
Impervious trails and road are present.

Left Descending Bank
Canopy cover is over 60% for the the wooded area within the AA.
Wetlands and a man made pond are present.
Impervious road and trails are present.

1. Identify Condition Category areas along the floodplain using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Riparian Area in in decimal form (0.00) and Score for each category in the blocks below.

Ensure the sum of the % Riparian Area Blocks equal 100

	Condition Category						Side Sub-Index	
Right Side	% Riparian Area:	79%	0%	0%	0%	0%	21%	0.73	Side Sub-Index = SUM(%Areas*Scores)/20
	Score:	18	0	0	0	0	2		
	Total Sub-score:	**14.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.42**		
	Condition Category								
Left Side	% Riparian Area:	89%	0%	0%	0%	2%	19%	0.83	CI = (Left Side CI + Right Side CI)/2 — CI
	Score:	18	0	0	0	7	2		0.78
	Total Sub-score:	**16.02**	**0.00**	**0.00**	**0.00**	**0.14**	**0.38**		

Riverine Assessment Form 1 - Page 2

3. RIPARIAN ZONE OF INFLUENCE: Assess land cover along both sides, 100 feet from edge of floodplain into the upland along the entire AA. (rough measurements of length & width may be acceptable)

	Condition Category																				Comments:
	Optimal					Suboptimal					Marginal					Poor					
Riparian ZOI	Riparian ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.					**High Suboptimal:** Riparian ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.			**Low Suboptimal:** Riparian ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.		**High Marginal:** Riparian ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.			**Low Marginal:** Riparian ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.		**High Poor:** Riparian ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.			**Low Poor:** Riparian ZOI area consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.		**Right Descending Bank** **Canopy cover is over 60% for the the wooded area within the AA.** **A wetland is present.** **Impervious roads and trails are present.** **Left Descending Bank** **Canopy cover is over 60% for the wooded area within the AA.** **A manmade pond is present.** **Impervious road and trails are present.**
						High			Low		High			Low		High			Low		
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

1. Identify Condition Category areas along the floodplain using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Riparian Area in decimal form (0.00) and Score for each category in the blocks below. — Ensure the sums of % Riparian ZOI Blocks equal 100

	Condition Category							Side Sub-Index	
Right Side	% Riparian Area:	80%	0%	0%	0%	0%	20%	**0.74**	**Side Sub-Index = SUM(%Areas*Scores)/20**
	Score:	18	0	0	0	0	2		
	Total Sub-score:	**14.40**	**0.00**	**0.00**	**0.00**	**0.00**	**0.40**		
	Condition Category								**CI**
Left Side	% Riparian Area:	70%	0%	0%	0%	14%	16%	**0.70**	**CI = (Left Side CI + Right Side CI)/2**
	Score:	18	0	0	0	7	2		**0.72**
	Total Sub-score:	**12.60**	**0.00**	**0.00**	**0.00**	**0.98**	**0.32**		

4. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths, woody and leafy debris, stable substrate, low embeddedness, shade, undercut banks, root mats, SAV, macrophytes, emergent vegetation, riffle-pool complexes, stable features.

	Condition Category																				Comments:	
	Optimal					Suboptimal					Marginal					Poor					**Substrate within the stream is primarily cobble, gravel, and fines. There is habitat suitable for epifaunal communities, but the shallow flow would not be suitable for fish communities.**	
Instream Habitat/ Available Cover	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 50% of the reach. Substrate is favorable for colonization by a diverse and abundant epifaunal community, and there are many suitable areas for epifaunal colonization and/or fish cover.					Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 30% and less than 50% of the reach. Conditions are mostly desirable and are generally suitable for full colonization by a moderately diverse and abundant epifaunal community.					Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 10% and less than 30% of the reach. Conditions are generally suitable for partial colonization by epifaunal and/or fish communities.					Physical Elements that enhance a stream's ability to support aquatic organisms are present in less than 10% of the reach. Conditions are generally unsuitable for colonization by epifaunal and/or fish communities. The reach.					**CI = (Score)/20**	**CI**
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	**SCORE** 7	**0.35**

5. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel/channelization, embankments, spoil piles, constrictions, etc.

	Condition Category																				Comments:	
	Negligible					Minor					Moderate					Severe					**The stream flows into a manmade lake, it is mildly channelized adjacent to an impervious trail.**	
Channel Alteration	Channel alterations listed above are absent in the SAR. The stream has unaltered pattern or has normalized.					**Minor High:** Less than or equal to 20% of the stream reach is disrupted by any of the channel alterations listed above. Alteration or channelization present, usually adjacent to structures, (such as bridge abutments or culverts); evidence of past alteration, (i.e., channelization) may be present, but stream pattern and stability have recovered; recent alteration is not present.			**Minor Low:** Greater than 20% and less than or equal to 40% of the stream reach is disrupted by any of the channel alterations listed above. Alteration or channelization present, usually adjacent to structures, (such as bridge abutments or culverts); evidence of past alteration, (i.e., channelization) may be present, but stream pattern and stability have recovered; recent alteration is not present.		**Moderate High:** Greater than 40% and less than or equal to 60% of reach is disrupted by any of the channel alterations listed above. If the stream has been channelized, normal stable stream meander pattern has not recovered.			**Moderate Low:** Greater than 60% and less than or equal to 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If the stream has been channelized, normal stable stream meander pattern has not recovered.		Greater than 80% of reach is disrupted by any of the channel alterations listed above. Greater than 80% of banks shored with gabion, riprap, or concrete.						
						High			Low		High			Low							**CI = (Score)/20**	**CI**
SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	**SCORE** 8	**0.40**

RIVERINE CONDITION INDEX (RCI)		RCI
NOTE: **The CIs and RCI should be rounded to 2 decimal places.**	**RCI = (Sum of all CI's)/5**	**0.57**

If a CI is not applicable (e.g. due to use on intermittent watercourse or >100 sq. mile drainage area) in order to utilize the auto calculator feature the user will need to modify the RCI formula or enter the maximum score for that CI to achieve a CI of 1.0 which will offset the divisor difference.

General Comments:

Riverine Assessment Form 1

Pennsylvania Riverine Condition Level 2 Rapid Assessment Protocol (Document No. 310-2137-003)

Pennsylvania Department of Environmental Protection

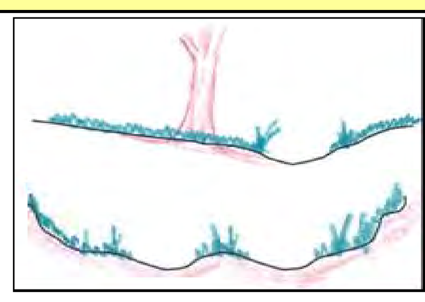
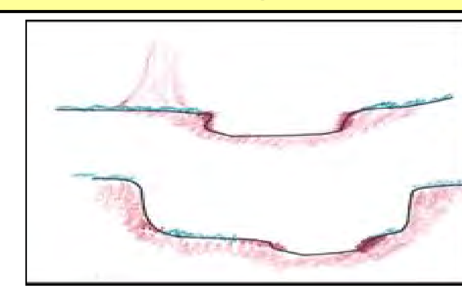
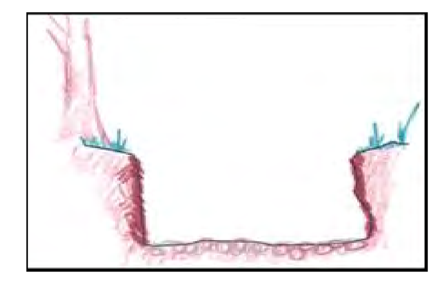
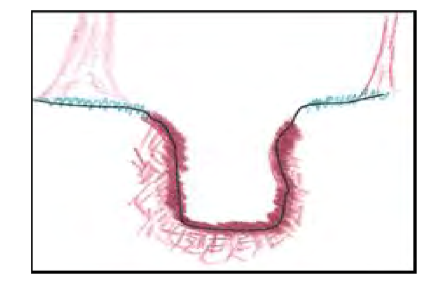
For use in intermittent or perennial watercourses with drainage areas ≤ 2,000 square mile drainage areas.

Project #	Project Name	Locality	Date	Ch 93 Classification		AA Id	Length
174-960	Four Mile Run Green Stormwater Infrastructure Project	City of Pittsburgh	5.25.2019	Designated: WWF	Existing: None	Riverine AA 22-3	189

Latitude	40°26'13.02"N	Longitude	79°56'47.60"W	FGM Level 1 Channel Classification	

Evaluator(s)	Stream Name and Information	Notes: This form represents the lower end of Stream 22, from the the channelization up stream of Lower Panther Hollow Trial to the confluence with Stream 10.
KKF KHG	Stream 22 (Phipps Run)	

1. CHANNEL/FLOODPLAIN: Assess the cross-section of the stream and prevailing conditions along the AA.

	Condition Category				
	Optimal	**Suboptimal**	**Marginal**	**Poor**	**Severe**
Channel / Floodplain	 **Channel Geometry:** These channels show very little incision or widening and little or no evidence of active erosion. Anastomosing channels may be present. **Channel Stability:** Visual indicators include: 1) the banks are not eroding along greater than 5% of the reach; 2) natural vegetative or rock stability features are present along greater than 80% of the banks; 2) stable point bars and bankfull benches may be present; 3) mid-channel bars and transverse bars are rare and if transient channel sediment deposition is present, it covers less than or equal to 10% of the stream bottom; 4) baseflow is connected to the rooting depths of vegetation in the active floodplain. **Active Floodplain Connection:** The bankfull stream flows have frequent access to the active floodplain and fully developed point bars or bankfull benches that are accessed at most flows greater than baseflow.	 **Channel Geometry:** These channels are slightly incised or overwidened and contain a few areas of active erosion. **Channel Stability:** Visual indicators include: 1) the banks are actively eroding along less than 25% of the reach; 2) depositional features such as point bars and bankfull benches are present and stable during high flows and occur along greater than 50% of the reach; 3) natural bank protection like vegetation or rock is providing stability along greater than 50% of the reach; 4) baseflow is connected to vegetated point bars and bankfull benches. **Active Floodplain Connection:** The bankfull stream flows frequently access bankfull benches, or point bars along portions of the reach and may frequently inundate the active floodplain.	 **Channel Geometry:** These channels are over-widened or incised, but to a lesser degree than the Severe and Poor channel conditions. **Channel Stability:** Visual indicators include: 1) the banks are eroding or severely undercut along greater than 25% and less than or equal to 50% of the reach; 2) depositional features like point bars or bankfull benches occur along greater than 25% and less than or equal to 50% of the reach; 3) the stream banks may consist of some vertical or undercut banks or nick points associated with head cuts; **Active Floodplain Connection:** The bankfull stream flows have infrequent connection to the active floodplain.	 **Channel Geometry:** These channels are over-widened or incised and eroding vertically and/or laterally. **Channel Stability:** Visual indicators include: 1) the banks are eroding or severely undercut along greater than 50% of the reach; 2) active or recent bank sloughing is present along greater than 50% of the reach; 3) natural bank protection like vegetation is not preventing bank erosion along the reach; 4) depositional features, such as point bars and bank full benches, are absent from the reach or newly developing along less than 25% of the reach; 5) bank full benches and point bars frequently scour during high flows; 6) baseflow is disconnected from plant rooting depths and the active floodplain. **Active Floodplain Connection:** The bankfull stream flows are not connected to the active floodplain.	 **Channel Geometry:** These channels are deeply incised and actively eroding vertically and/or laterally. Over widened channels may contain sections of unstable braided channels from aggradation. **Channel Stability:** Visual indicators include: 1) the banks are actively eroding or being undercut along greater than 80% of the reach; 2) active or recent bank sloughing is occurring along greater than 80% of the reach; 3) natural bank protection like vegetation is not preventing bank erosion or sloughing; 4) depositional features such as point bars and bankfull benches are absent; 5) flood flows are disconnected from the active floodplain. **Active Floodplain Connection:** The bankfull stream flows are never connected to the active floodplain.
SCORE	20 19 18 17	16 15 14 13	12 11 10 9	8 7 6 5	4 3 2 1

Comments:

Within this AA Stream 22 has been atrificially channelized with large boulders and is disconnected from the floodplain in all but the most extreme storm events.

CI = (Score)/20		CI
SCORE	5	0.25

2. RIPARIAN VEGETATION: Assess the floodplain along the entire AA (Visual estimates of areal coverage from aerial photos with field verification acceptable).

	Condition Category						
	Optimal	**Suboptimal**		**Marginal**		**Poor**	
Riparian Vegetation (Floodplain)	Riparian area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** Riparian area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** Riparian area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** Riparian area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Riparian area consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.
		High	Low	High	Low	High	Low
SCORE	20 19 18 17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1

Comments:

Right Descending Bank
Canopy cover is over 60% for the wooded area within the AA.
Impervious trails and road are present.

Left Descending Bank
Canopy cover is over 60% for the wooded area within the AA.
A PSS/PEM wetland comprises appriximatly 17% of the left descending bank riparian vegetation.
Impervious trails are present.

1. Identify Condition Category areas along the floodplain using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Riparian Area in in decimal form (0.00) and Score for each category in the blocks below.

Ensure the sum of the % Riparian Area Blocks equal 100

	Condition Category							Side Sub-Index
Right Side	% Riparian Area:	82%	0%	0%	0%	0%	18%	0.76
	Score:	18	0	0	0	0	2	
	Total Sub-score:	**14.76**	**0.00**	**0.00**	**0.00**	**0.00**	**0.36**	
	Condition Category							
Left Side	% Riparian Area:	83%	0%	0%	0%	0%	11%	0.76
	Score:	18	0	0	0	0	2	
	Total Sub-score:	**14.94**	**0.00**	**0.00**	**0.00**	**0.00**	**0.22**	

Side Sub-Index = SUM(%Areas*Scores)/20

CI = (Left Side CI + Right Side CI)/2	CI
	0.76

Riverine Assessment Form 1 - Page 2

3. RIPARIAN ZONE OF INFLUENCE: Assess land cover along both sides, 100 feet from edge of floodplain into the upland along the entire AA. (rough measurements of length & width may be acceptable)

	Condition Category							Comments:
	Optimal	Suboptimal		Marginal		Poor		**Right Descending Bank** **Canopy cover is over 60% for the wooded area within the AA.** **A manmade pond is present.** **Impervious trails and road are present.** **Left Descending Bank** **Canopy cover is over 60% for the wooded area within the AA.** **A PSS/PEM wetland comprises appriximatly 6% of the left descending bank zone of influence.** **Pervious and impervious trails and roads are present.**
Riparian ZOI	Riparian ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** Riparian ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** Riparian ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** Riparian ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained	**High Poor:** Riparian ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Riparian ZOI area consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	
		High	Low	High	Low	High	Low	
SCORE	20 19 18 17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1	

1. Identify Condition Category areas along the floodplain using the descriptors above.
2. Estimate the % area within each condition category.
3. Enter the % Riparian Area in decimal form (0.00) and Score for each category in the blocks below.

Ensure the sums of % Riparian ZOI Blocks equal 100

	Condition Category							Side Sub-Index	
Right Side	% Riparian Area:	60%	0%	0%	0%	7%	33%	**0.60**	**Side Sub-Index = SUM(%Areas*Scores)/20**
	Score:	18	0	0	0	7	2		
	Total Sub-score:	**10.80**	**0.00**	**0.00**	**0.00**	**0.49**	**0.66**		
	Condition Category								
Left Side	% Riparian Area:	91%	0%	0%	0%	0%	9%	**0.84**	**CI = (Left Side CI + Right Side CI)/2**
	Score:	18	0	0	0	0	5		**CI**
	Total Sub-score:	**16.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.45**		**0.72**

4. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths, woody and leafy debris, stable substrate, low embeddedness, shade, undercut banks, root mats, SAV, macrophytes, emergent vegetation, riffle-pool complexes, stable features.

	Condition Category				Comments:	
	Optimal	Suboptimal	Marginal	Poor	**The stream is heavily impacted by siltation. All substrate present are gravel and fines. Pools and other habitat enhancement is limited and conditions are poor for epifaunal or fish communities.**	
Instream Habitat/ Available Cover	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 50% of the reach. Substrate is favorable for colonization by a diverse and abundant epifaunal community, and there are many suitable areas for epifaunal colonization and/or fish cover.	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 30% and less than 50% of the reach. Conditions are mostly desirable and are generally suitable for full colonization by a moderately diverse and abundant epifaunal community.	Physical Elements that enhance a stream's ability to support aquatic organisms are present in greater than or equal to 10% and less than 30% of the reach. Conditions are generally suitable for partial colonization by epifaunal and/or fish communities.	Physical Elements that enhance a stream's ability to support aquatic organisms are present in less than 10% of the reach. Conditions are generally unsuitable for colonization by epifaunal and/or fish communities. The reach.	**CI = (Score)/20**	**CI**
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1	**SCORE** 2	**0.10**

5. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel/channelization, embankments, spoil piles, constrictions, etc.

	Condition Category						Comments:	
	Negligible	Minor		Moderate		Severe	**Within this AA Stream 22 is channelized with large boulders to prevent erosion of the trail.**	
Channel Alteration	Channel alterations listed above are absent in the SAR. The stream has unaltered pattern or has normalized.	**Minor High:** Less than or equal to 20% of the stream reach is disrupted by any of the channel alterations listed above. Alteration or channelization present, usually adjacent to structures, (such as bridge abutments or culverts); evidence of past alteration, (i.e., channelization) may be present, but stream pattern and stability have recovered; recent alteration is not present.	**Minor Low:** Greater than 20% and less than or equal to 40% of the stream reach is disrupted by any of the channel alterations listed above. Alteration or channelization present, usually adjacent to structures, (such as bridge abutments or culverts); evidence of past alteration, (i.e., channelization) may be present, but stream pattern and stability have recovered; recent alteration is not present.	**Moderate High:** Greater than 40% and less than or equal to 60% of reach is disrupted by any of the channel alterations listed above. If the stream has been channelized, normal stable stream meander pattern has not recovered.	**Moderate Low:** Greater than 60% and less than or equal to 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If the stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed above. Greater than 80% of banks shored with gabion, riprap, or concrete.		
		High	Low	High	Low		**CI = (Score)/20**	**CI**
SCORE	20 19 18 17 16	15 14 13	12 11	10 9 8	7 6	5 4 3 2 1	**SCORE** 1	**0.05**

RIVERINE CONDITION INDEX (RCI)		**RCI**
NOTE: **The CIs and RCI should be rounded to 2 decimal places.**	**RCI = (Sum of all CI's)/5**	**0.38**

If a CI is not applicable (e.g. due to use on intermittent watercourse or >100 sq. mile drainage area) in order to utilize the auto calculator feature the user will need to modify the RCI formula or enter the maximum score for that CI to achieve a CI of 1.0 which will offset the divisor difference.

General Comments:

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsylvania except those found within the banks of a watercourse.

Project #	Project Name	Date	Proposed Impact Size (acres)	AA #	AA Size (acres)
174-960	Four Mile Run Green Stormwater Infrastructure Project	5/25/2018	0.292	Wetland AA-7	0.292

Name(s) of Evaluator(s)	Lat (dd)	Long (dd)	Notes:
KKF KHG	40° 26' 13.19" N	79° 56' 49.89" W	

Wetland 7 is a PEM on the edge of a man made reflecting pond. The wetland has formed because the stream that provides hydrology to the pond has also deposited large amounts of sediment into the pond.

1. Wetland Zone of Influence Condition Index

Condition Category

Wetland Zone of Influence (300 foot area around AA perimeter)	Optimal	Suboptimal		Marginal		Poor		CI = Total Score/20
	ZOI area vegetation consists of a tree stratum present (diameter at breast height (dbh) > 3 inches) with greater than or equal to 60% tree canopy cover. Areas comprised of stream channels, wetlands (regardless of classification or condition) and lacustrine resources ≥ 10 acres are scored as optimal.	**High Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** ZOI area vegetation consists of a tree stratum (dbh > 3 inches) present, with greater than or equal to 30% and less than 60% tree canopy cover with a maintained understory.	**High Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation with either a shrub layer or a tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover.	**Low Marginal:** ZOI area vegetation consists of non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, areas of hay production, and ponds or open water areas (< 10 acres). If trees are present, tree stratum (dbh > 3 inches) present, with less than 30% tree canopy cover with maintained understory.	**High Poor:** ZOI area vegetation consists of lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, pervious trails, recently seeded and stabilized, or other comparable condition.	**Low Poor:** ZOI area vegetation consists of impervious surfaces; mine spoil lands, denuded surfaces, row crops, active feed lots, impervious trails, or other comparable conditions.	
SCORE	20 19 18 17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1	

1. Identify all applicable Condition Category areas within the wetland zone of influence using the descriptors above.
2. Estimate the % area within each condition category. Calculators are provided for you below.
3. Enter the % ZOI Area in decimal form (0.00) and Score for each category in the blocks below.

Total Score = SUM(%Areas*Scores)

Scoring:	Condition Category:	Optimal	High Suboptimal	Low Suboptimal	High Marginal	Low Marginal	Poor	Total Score:	
	% ZOI Area:	69%	0%	0%	0%	0%	31%		
	Score:	18	0	0	0	0	1		0.64
	Total Sub-score:	12.42	0.00	0.00	0.00	0.00	0.31	12.73	

Comments:

2. Roadbed Presence Index

Condition Categories

a. Roadbed Presence (within 0 - 100 foot Wetland ZOI distance)	Optimal		Suboptimal		Marginal		Poor	
	High Optimal: No roadbeds present within 100 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 0-100 feet of the AA boundary equal to or less than 2.	**High Suboptimal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 0-100 foot distance of the AA boundary is greater than 12.
SCORE	20 19 18	17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1

Comments:
Three impervious dirt/gravel trails, one stone trail, and one 4 lane paved road are located within the 0-100 foot buffer. The paved road is a bridge appriximatly 100 feet above the wetland, however runoff from the bridge drops down into the 0-100 foot buffer.

Condition Categories

b. Roadbed Presence (within 100 - 300 foot Wetland ZOI distance)	Optimal		Suboptimal		Marginal		Poor		CI = Total Score/20
	High Optimal: No roadbeds present within 100 - 300 feet of the AA boundary	**Low Optimal:** Roadbed presence score within 100 - 300 feet of the AA boundary equal to or less than 2.	**High Suboptimal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 2 but equal to or less than 4.	**Low Suboptimal:** Roadbed presence score within 100 - 300 feet AA boundary is greater than to 4 but less than or equal to 6.	**High Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 6 but less than or equal to 8.	**Low Marginal:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 8 but less than or equal to 10.	**High Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than to 10 but less than or equal to 12.	**Low Poor:** Roadbed presence score within 100 - 300 feet of the AA boundary is greater than 12.	
SCORE	20 19 18	17 16	15 14 13	12 11	10 9 8	7 6	5 4 3	2 1	

	Condition Score	Weighting	Sub-Scores	
a. Roadbed 0-100:	8	* (0.67)	5	
b. Roadbed 100-300:	2	* (0.33)	1	0.30
		Total Score:	6	

Comments:
Six impervious dirt/gravel trails, one stone trail, one paved 2 lane road, and one 4 lane paved road are located within the 0-100 foot buffer. The paved road is a bridge appriximatly 100 feet above the wetland, however runoff from the bridge drops down into the 100-300 foot buffer.

2/14/2019

Wetland Condition Assessment Form

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002)

Pennsylvania Department of Environmental Protection

For use in all wetland classifications found within Pennsylvania except those found within the banks of a watercourse.

3. Vegetation Condition Index

	Condition Category							
	Optimal		**Suboptimal**		**Marginal**		**Poor**	
a. Invasive Species Presence	**High Optimal:** No invasives present.	**Low Optimal:** <5% of the total AA contains invasive species.	**High Suboptimal:** >5% but less than 10% of the total AA contains invasive species	**Low Suboptimal:** >10% but less than 20% of the total AA contains invasive species	**High Marginal:** >20% but less than 30% of the total AA contains invasive species	**Low Marginal:** >30% but less than 50% of the total AA contains invasive species	> 50% of the total AA contains invasive species.	
SCORE	**20 19 18**	**17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3 2 1**	

Comments:
One invasive species is present and comprises 30% of the total cover.

	Condition Category							
	Optimal		**Suboptimal**		**Marginal**		**Poor**	
b. Vegetation Stressor Presence	**High Optimal:** No vegetation stressors present within the AA boundary.	**Low Optimal:** One vegetation stressor present within the AA boundary.	**High Suboptimal:** Two vegetation stressors present within the AA boundary	**Low Suboptimal:** Three vegetation stressors present within the AA boundary	**High Marginal:** Four vegetation stressors present within the AA boundary	**Low Marginal:** Five vegetation stressors present within the AA boundary.	Greater than five vegetation stressors present within the AA boundary.	**CI = Total Score/40**
SCORE	**20 19 18**	**17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3 2 1**	

Comments:
No vegetation stressors are present within the wetland.

a. Invasive Sub-Score:	8	**Total Score**	**0.68**
b. Vegetation Sub-Score:	19	27	

4. Hydrologic Modification Index

	Condition Category							
	Optimal		**Suboptimal**		**Marginal**		**Poor**	
Hydrologic Modification Stressor Presence	**High Optimal:** No hydrologic stressors present within the AA boundary.	**Low Optimal:** One hydrologic stressor present within the AA boundary.	**High Suboptimal:** Two hydrologic stressors present within the AA boundary.	**Low Suboptimal:** Three hydrologic stressors present within the AA boundary.	**High Marginal:** Four hydrologic stressors present within the AA boundary.	**Low Marginal:** Five hydrologic stressors present within the AA boundary.	Greater than five hydrologic stressors present within the AA boundary.	**CI = Total Score/20**
SCORE	**20 19 18**	**17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3 2 1**	**0.70**

Comments:
Two sources of urban runoff were observed in the wetland.

Score:	14

5. Sediment Stressor Index

	Condition Category							
	Optimal		**Suboptimal**		**Marginal**		**Poor**	
Sediment Stressor Presence	**High Optimal:** No sediment stressors present within the AA boundary.	**Low Optimal:** One sediment stressor present within the AA boundary.	**High Suboptimal:** Two sediment stressors present within the AA boundary.	**Low Suboptimal:** Three sediment stressors present within the AA boundary.	**High Marginal:** Four sediment stressors present within the AA boundary.	**Low Marginal:** Five sediment stressors present within the AA boundary.	Greater than five sediment stressors present within the AA boundary.	**CI = Total Score/20**
SCORE	**20 19 18**	**17 16**	**15 14 13**	**12 11**	**10 9 8**	**7 6**	**5 4 3 2 1**	**0.75**

Comments:
Sediment plumes and elevated turbidity were observed within the wetland.

Score:	15

6. Water Quality Stressor Index

	Condition Category				
	Optimal	**Suboptimal**	**Marginal**	**Poor**	
a. Eutro-phication Stressor Presence	No eutrophication stressors present within the AA boundary.	One eutrophication stressors present within the AA boundary.	Two eutrophication stressors present within the AA boundary.	Three eutrophication stressors present within the AA boundary.	
SCORE	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1**	

Comments:
No water quality stressors were observed.
Golf courses are present upgradient from the wetland however they are located out side of the 300 food buffer.

	Condition Category				
	Optimal	**Suboptimal**	**Marginal**	**Poor**	
b. Contaminant / Toxicity Stressor Presence	No contaminant / toxicity stressors present within the AA boundary.	One contaminant / toxicitystressors present within the AA boundary.	Two contaminant / toxicity stressors present within the AA boundary.	Three contaminant / toxicity stressors present within the AA boundary.	**CI = Total Score/40**
SCORE	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1**	

Comments:
No contaminant/toxicity stressors were observed.

a. Eutrophication Score	19	**Total Score:**	**0.95**
b. Contaminant Score	19	38	

Overall Wetland Level 2 Condition Score: Sum all six of the Condition Indexes and divide by 6 to calculate the overall condition score.	**Overall Condition Index:**	**0.67**

2/24/2019

Pennsylvania Wetland Condition Level 2 Rapid Assessment

(Document No. 310-2137-002)
Pennsylvania Department of Environmental Protection

Roadbed Worksheet

Project Name / Identifier			Date	Name(s) of Evaluator(s)
Four Mile Run Green Stormwater Infrastructure Project			5.25.2018	KKF KHG
Resource Identifier	AA #	Lat (dd)	Long (dd)	Notes:
Wetland 7	Wetland AA-7	40°26'13.19" N	79°56'49.89"W	

Roadbeds: Record the number of occurrences by roadbed type and distance category. Multiply the number of occurrences by the weighting factors for each roadbed type and distance category then sum the total score for each distance category. The total scores for each distance category are then compared to the condition category descriptions.

Roadbed Type	Distance	Occurrences	Weighting Factor	Score	Distance	Occurrences	Weighting Factor	Score
≥ 4 Lane Paved	0-100 ft.	1	4	4	100-300 ft.	1	4	4
2 Lane Paved	0-100 ft.		2	0	100-300 ft.	1	2	2
1 Lane Paved	0-100 ft.		1	0	100-300 ft.		1	0
Gravel Road	0-100 ft.		1	0	100-300 ft.		1	0
Dirt Road	0-100 ft.		2	0	100-300 ft.		2	0
Railroad	0-100 ft.		2	0	100-300 ft.		2	0
Other Roadbeds	0-100 ft.	4	1, 2 or 4	4	100-300 ft.	7	1, 2 or 4	7
Total Scores:	0-100 ft.	8			100-300 ft.	13		

Road Comments:

Three impervious dirt/gravel trails, one stone trail, and one 4 lane paved road are located within the 0-100 foot buffer. The paved road is a bridge appriximatly 100 feet above the wetland; however, runoff from the bridge drops down into the 0-100 foot buffer.

Six impervious dirt/gravel trails, one stone trail, one paved 2 lane road, and one 4 lane paved road are located within the 0-100 foot buffer. The paved road is a bridge appriximatly 100 feet above the wetland, however runoff from the bridge drops down into the 100-300 foot buffer.

Pennsylvania Wetland Condition Level 2 Rapid Assessment (Document No. 310-2137-002) Pennsylvania Department of Environmental Protection **STRESSOR WORKSHEET**	2/14/2019 **Occurrence in AA**		
	Y	**#'s**	**N**
Vegetation Alteration			
Mowing			X
Moderate livestock grazing (within one year)			X
Crops (annual row crops, within one year)			X
Selective tree harvesting/cutting (>50% removal, within 5 years)			X
Right-of-way clearing (mechanical or chemical)			X
Clear cutting or Brush cutting (mechanized removal of shrubs and saplings)			X
Removal of woody debris			X
Aquatic weed control (mechanical or herbicide)			X
Excessive herbivory (deer, muskrat, nutria, carp, insects, etc.)			X
Plantation (conversion from typical natural tree species, including orchards)			X
Other:			X
Total Number:		**0**	
Hydrologic Modification			
Ditching, tile draining, or other dewatering methods			X
Dike/weir/dam			X
Filling/grading			X
Dredging/excavation			X
Stormwater inputs (culvert or similar concentrated urban runoff)	X	2	
Microtopographic alterations (e.g., plowing, forestry bedding, skidder/ATV tracks)			X
Dead or dying trees (trunks still standing) *			X
Stream alteration (channelization or incision)			X
Other:			X
Total Number:		**2**	
Sedimentation			
Sediment deposits/plumes	X		
Eroding banks/slopes			X
Active construction (earth disturbance for development)			X
Active plowing (plowing for crop planting in past year)			X
Intensive livestock grazing (in one year, ground is >50% bare)			X
Active selective forestry harvesting (within one year)			X
Active forest harvesting (within two years, includes roads, borrow areas, pads, etc.)			X
Turbidity (moderate concentration of suspended solids in the water column, obvious sediment discharges)	X		
Other:			X
Total Number:		**2**	
Eutrophication			
Direct discharges from agricultural feedlots, manure pits, etc.			X
Direct discharges from septic or sewage treatment plants, fish hatcheries, etc.			X
Heavy or moderately heavy formation of algal mats			X
Other:			X
Total Number:		**0**	
Contaminant/Toxicity			
Severe vegetation stress (source unknown or suspected)			X
Obvious spills, discharges, plumes, odors, etc.			X
Acidic drainages (mined sites, quarries, road cuts)			X
Point discharges from adjacent industrial facilities, landfills, railroad yards, or comparable sites			X
Chemical defoliation (majority of herbaceous and woody plants affected, within one year)			X
Fish or wildlife kills or obvious disease or abnormalities observed			X
Excessive garbage/dumping			X
Other:			X
Total Number:		**0**	

**** Dead or dying trees attributed to beaver activity or emerald ash borer (or other identifiable insect infestation) should not be recorded as a stressor present. The assessor is responsible for recording observations in the comment section concerning presence of these conditions.***

Pennsylvania Wetland Condition Level 2 Rapid Assessment
(Document No. 310-2137-002)
Pennsylvania Department of Environmental Protection

Invasive Species Presence Worksheet

Are invasive species (from list) present at the site in any layer? **YES** NO

If listed species present, enter the percent areal coverage for each species below:

Species Code	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%	*Species Code*	<5%	≥ 5-20%	≥ 20 - 50%	≥ 50%
tyan			30						

Total % relative cover of all invasives, collectively on site: 30 %

Comments:

Common Invasives/Aggressives List

Code	Common Name	*Scientific*	Status	Code	Common Name	*Scientific*	Status
aggi2	Redtop	*Agrostis gigantea*	FACW	luhe	Water primrose	*Ludwigia hexapetala*	OBLW
algl2	European Alder	*Alnus glutinosa*	FACW	lyvu	Garden loosestrife	*Lysimachia vulgaris*	OBLW
arhi3	Carpetgrass	*Arthraxon hispidus*	FAC-	lysa2	Purple loosestrife	*Lythrum salicaria*	FACW
beth	Japanese barberry	*Berberis thunbergii*	FACW	maqu	European waterclover	*Marsilea quadrifolia*	OBLW
bevu	European barberry	*Berberis vulgaris*	FACW	mivi	Japanese stiltgrass	*Microstegium vimineum*	FAC
butom	Flowering Rush	*Butomus umbellatus*	OBLW	nami2	Water cress	*Nasturtium officinale*	OBLW
calli6	Pond water-starwort	*Callitriche stagnalis*	OBLW	pelo	Low smartweed	*Persicaria longiseta*	FACW
egde	Brazilian waterweed	*Egeria densa*	OBLW	phar	Reed canary grass	*Phalaris arundinacea*	FACW
elan	Russian olive	*Elaeagnus angustifolia*	FACU	phau7	Common Reed	*Phragmites australis*	OBLW
elum	Autumn olive	*Elaeagnus umbellata*	FACU	potr	Rough bluegrass	*Poa trivialis*	FACW
ephi	Hairy willow-herb	*Epilobium hirsutum*	FACW	pocu6	Japanese knotweed	*Polygonum (Faloia) cuspidatum*	FAC-
eppa5	Willow-herb	*Epilobium parviflorum*	FACW	pgpf	Mile-a-minute	*Polygonum perfoliatum*	FAC-
fasa	Giant knotweed	*Fallopia sachalinensis*	OBLW	puera	Kudzu-vine	*Pueraria lobata*	FAC-
gldi	Mudmats	*Glossostigma diandrum*	OBLW	pysp1	Apple/crabapple/pear	*Pyrus sp.*	FAC?
hola	Velvetgrass	*Holcus lanatus*	FAC	rhfr	Glossy Buckthorn	*Rhamnus frangula*	FAC-
huja	Japanese Hops	*Humulus japonicus*	FACU	romu	Multiflora rose	*Rosa multiflora*	FACU
loja	Japanese honeysuckle	*Lonicera japonica*	FAC-	tyan	Cattail (hybrid)	*Typha angustifolia*	OBLW
lomo	Morrow's honeysuckle	*Lonicera morrowii*	NI	tygl	Hybrid cattail	*Typha x glauca*	OBLW
lota	Tartarian honeysuckle	*Lonicera tatarica*					