HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

12 October 2016
File No. 40373-345

SUBJECT: CCR History of Construction
Pond 10
Dayton Power & Light Company
J.M. Stuart Electric Generating Station
Aberdeen, Ohio

Haley & Aldrich, Inc. (Haley & Aldrich) has assisted Dayton Power & Light Company (DP&L) with compiling the history of construction for Pond 10 at the J.M. Stuart Electric Generating Station. This work was performed in accordance with the US Environmental Protection Agency's (EPA's) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities, 40 CFR Part 257, specifically §257.73(c)(1).

To the extent feasible, Dayton Power & Light Co. has provided documentation supporting the history of construction. Information on the history of construction for Pond 10 is presented in the following sections.

§257.73(c)(1)(i): The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.

Owner: Dayton Power & Light Company
745 US Route 52
P.O. Box 468
Aberdeen, OH 45101

Name of Unit: Pond 10

NID[1] ID/ODNR/OEPA Number: OH03030/8535-011/06-5901

§257.73(c)(1)(ii): The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map or topographic map of equivalent scale if a USGS map is not available.

Latitude: 38°38'22"
Longitude: 83°41'06"
The general facility location map is included in **Appendix 1**.

1 National Inventory of Dams database which documents dams in the United States and is maintained by the USACE.

<u>§257.73(c)(1)(iii):</u> A statement of the purpose for which the CCR unit is being used.

Pond 10 is a CCR impoundment that receives wet sluiced fly ash produced from the combustion of coal in the station generating units.

<u>§257.73(c)(1)(iv):</u> The name and size, in acres, of the watershed within which the CCR unit is located.

Watershed Name: DP&L Pond 10
Watershed Area: 30 acres

Watershed delineation and associated area are included in **Appendix 2**, from a memorandum titled, "Pond 10 Inflow Design Flood Control System Plan," by Haley & Aldrich, dated October 2016. Since the Ash Pond berms are above-grade, the watershed area corresponds to the pond boundaries shown in the figure.

<u>§257.73(c)(1)(v)</u>: A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.

A description of the physical and engineering properties of the foundation and abutment materials on which Pond 10 is constructed is included in the report entitled, "Engineering Design Report, Ash Pond #10" by URS Corporation, dated 2 July 1999. Pertinent pages from this report providing the required information are included as **Appendix 3**.

A subsurface exploration program, including work around Pond 10, was performed as part of the CCR Rule compliance Safety Factor Assessment. The final report, entitled "Initial Safety Factor Assessment, J.M. Stuart Station, Ponds 3A, 5, 6, 7, and 10" by Haley & Aldrich, Inc., dated October 2016 details test borings and cone penetrometer soundings performed adjacent to the unit (see pages 5-7 and Appendix A). This report in its entirety is available to the public via the DP&L CCR Rule compliance website.

<u>§257.73(c)(1)(vi)</u>: A statement of the type, size, range, and physical engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.

Pond 10 was constructed in **1** zone/stage.

The type, size, range, and physical engineering properties of the materials of each stage of Pond 10 are discussed in the following reports:

- "Engineering Design Report, Ash Pond #10" by URS Corporation, dated 2 July 1999.

- "Permit to Installation Application, Dayton Power and Light, J.M. Stuart Electric Generating Station, Fly Ash Pond 10, Volumes 1 and 2" by URS Greiner Woodward Clyde, dated 2 July 1999

The method of site preparation and construction of the Pond 10 embankments are discussed below:

The above referenced URS Greiner Woodward Clyde report indicates the Pond 10 embankments generally consist of a few feet of stiff to very stiff lean CLAY to SILT which is underlain by a thick deposit of very loose to medium dense SAND with varying amounts of silt and gravel. Specification Section 02290, Earth Dikes included requirements for compaction equipment, proof rolling and preparation of foundation soils, compaction test sections, placement and compaction methods, and minimum compaction requirements. The bottom ash berm fill and other materials within the embankment were required by the specification to be compacted to at least 98 percent of the maximum density as determined by ASTM D698 (Standard Proctor). DP&L has supplementally reported that a Modified Drive Hammer" method was developed and used for compaction testing following approval by ODNR.

- The approximate dates of construction for each zone/stage are as follows:
  - Zone/Stage 1: 2001**;**

Pertinent pages from the above referenced reports providing the required information are included **Appendix 4**.

<u>§257.73(c)(1)(vii)</u>: At a scale that details engineering structures and appurtenances relevant to the design, construction, operation and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.

Design drawings providing information listed above, as available are included in **Appendix 5**. Should the provided design drawings not include information identified in 257.73(c)(1)(vii), it should be assumed that design drawings including this information are not available.

<u>§257.73(c)(1)(viii)</u>: A description of the type, purpose, and location of existing instrumentation.

The following instrumentation exists at Pond 10:

- Six (6) survey monitoring points – P101-1 through P101-6
- Staff gage

Survey readings on the monitoring points were presented in a report entitled, "Pond 10 Dam Inspection Report," by DP&L, dated 11 June 2013. The staff gage was installed to regularly monitor the water level in Pond 10.

Pertinent pages from the above referenced report providing the required information are included in **Appendix 6**.

§257.73(c)(1)(ix): Area- capacity curves for the CCR unit.

A large number of DP&L historical facility documents were provided to Haley & Aldrich, Inc. by DP&L, within which no record of area-capacity curves for Pond 10 was found.

§257.73(c)(1)(x): A description of each spillway and diversion design features and capacity calculations used in their determination.

The Pond 10 spillway consists of a 24-foot high reinforced concrete riser structure with inside dimensions of 8-1/2 foot by 8-1/2 foot, located in the south corner of the pond. The level in the pond is controlled by removable stop logs installed in the structure. A knife valve is located on the interior of the structure, which can be shut to prevent flow from entering the outlet pipe to allow for pipe maintenance/repairs of the 30-inch diameter HDPE outfall pipe that conveys flow to Pond 6.

A description of the spillway and diversion design feature and capacity calculations for Pond 10 are discussed in the following reports:

- "Assessment of Dam Safety, Coal Combustion Surface Impoundments (Task 3) Final Report" by CHA, dated 26 March 2010.
- "Dam Safety Inspection Report – J.M. Stuart Station Ash Pond 10," by Ohio Department of Natural Resources, dated 27 June 2013.

Pertinent pages from these reports providing the required information are included in **Appendix 7**.

§257.73(c)(1)(xi): The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.

The construction specifications and provisions for surveillance, maintenance, and repair of Pond 10 are discussed in the following documents:

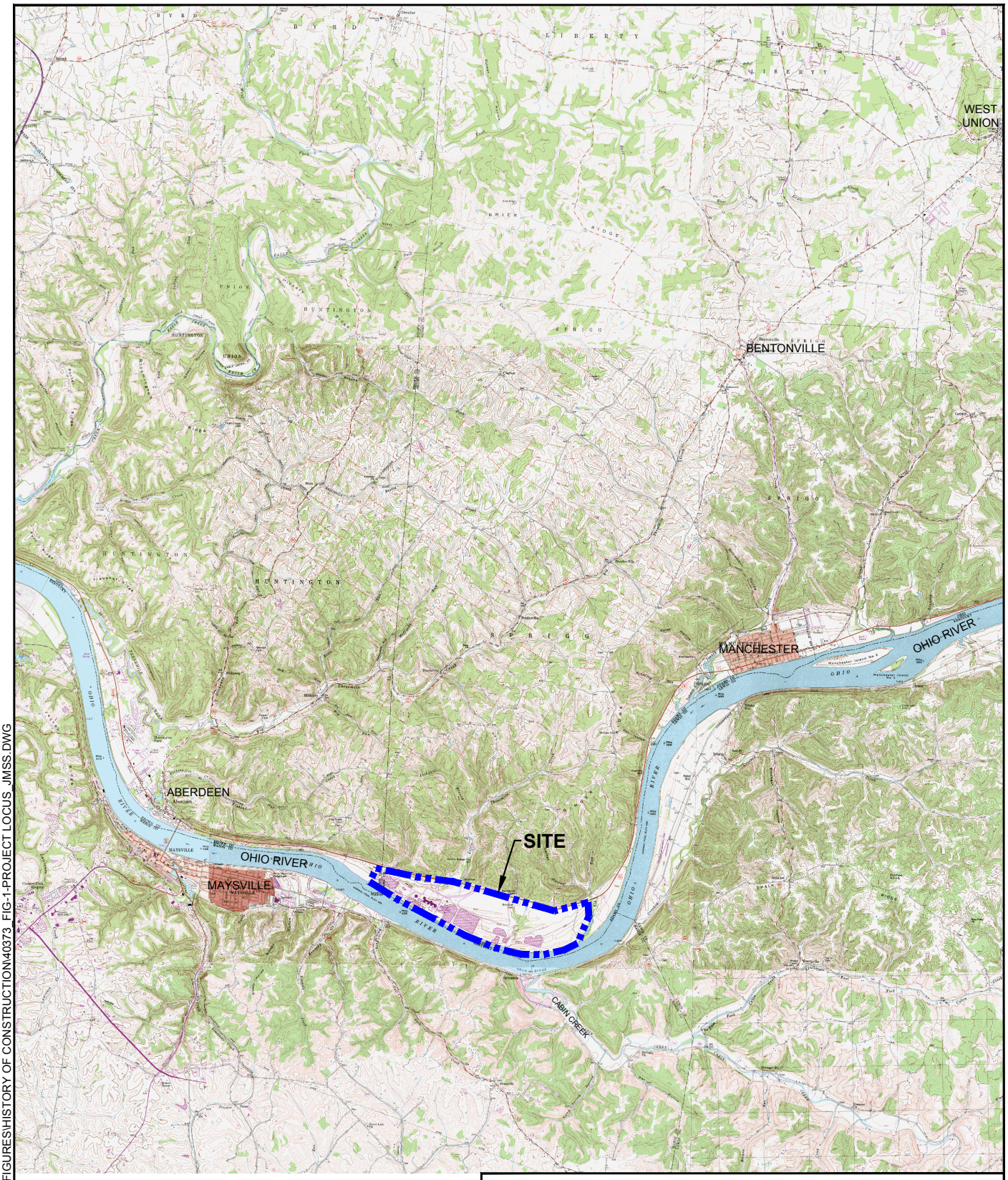
- "Operations Maintenance and Inspection Manual Ash Impoundment Dike Stuart Electric Generating Station" by DP&L, dated 8 April 2014.
- "Assessment of Dam Safety Coal Combustion Surface Impoundments (Task 3) Final Report" by CHA, dated 26 March 2010.

Pertinent pages from the above referenced reports providing the required information are included in **Appendix 8**.

§257.73(c)(1)(xii): Any record or knowledge of structural instability of the CCR unit.

There are no records or knowledge of structural instability associated with Pond 10**.**

APPENDIX 1
Site Locus



TOPO SOURCE: USGS TOPOGRAPHIC MAPS
RUSSELLVILLE, DECATUR, WEST UNION, MAYSVILLE EAST, MAYSVILLE WEST , MANCHESTER ISLANDS - OHIO
MAYS LICK, ORANGEBURG, TOLLESBORO - KENTUCKY
QUADRANGLES (2013)

HALEY ALDRICH

DAYTON POWER & LIGHT COMPANY
J. M. STUART GENERATING STATION
745 U.S. ROUTE 52
ABERDEEN, OHIO

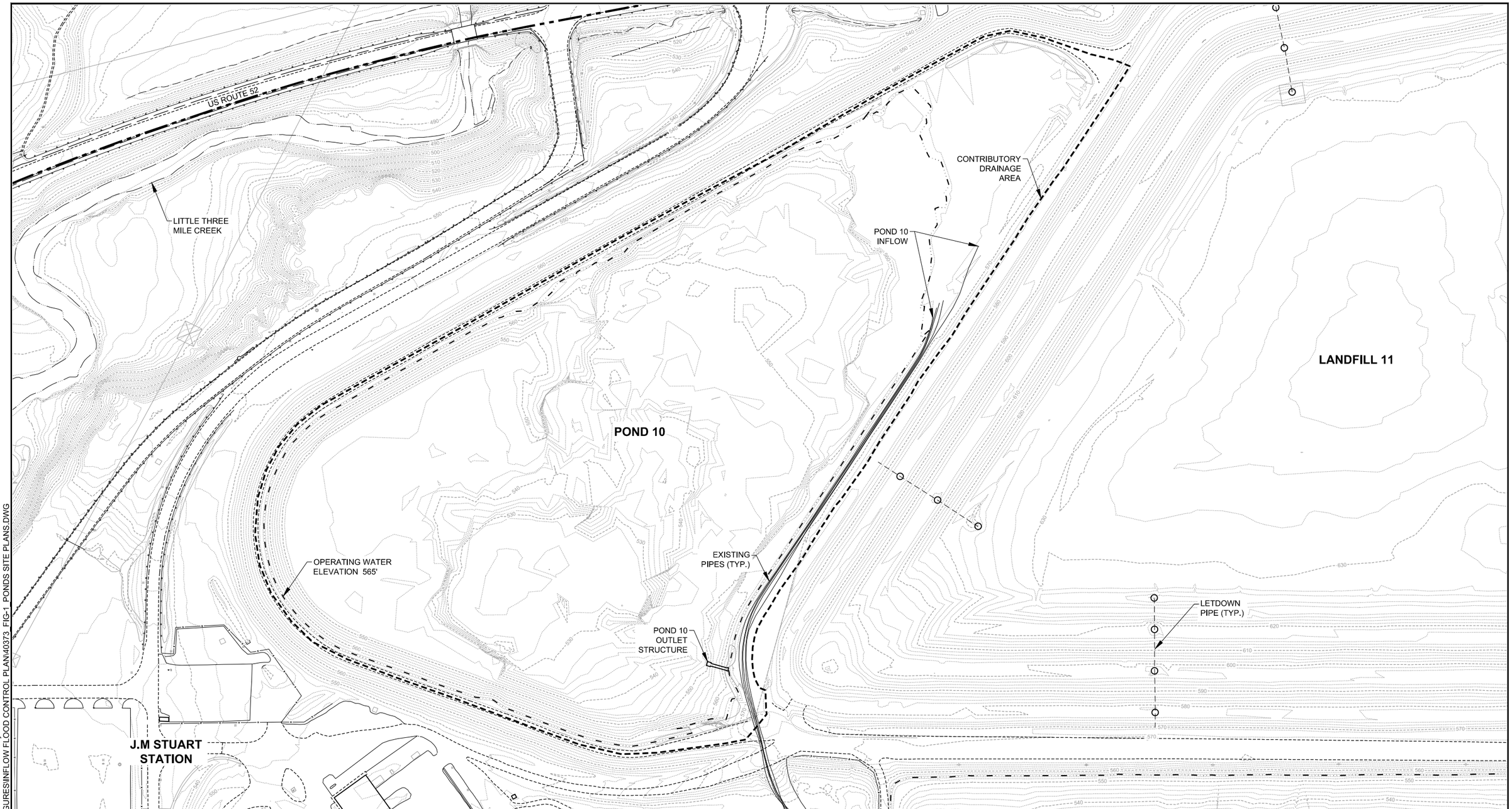
PROJECT LOCUS

APPROXIMATE SCALE: 1" = 10 000'
OCTOBER 2016

FIGURE 1

LUCAS, ANDY Printed: 9/30/2016 11:16 AM Layout: FIGURE 1
G:\40373_DP&L\CAD-JMSS\GLOBAL\FIGURES\HISTORY OF CONSTRUCTION\40373_FIG-1-PROJECT LOCUS_JMSS.DWG

APPENDIX 2
Figure 1 and Appendix from:
Pond 10 Inflow Design Flood Control System Plan
By Haley & Aldrich, Dated October 2016



LEGEND

- EXISTING PROPERTY LINE
- EXISTING MAJOR CONTOUR (550)
- EXISTING MINOR CONTOUR
- EXISTING PIPES
- EXISTING GRAVEL ROAD
- EXISTING WATER
- CONTRIBUTORY DRAINAGE AREA
- TYPICAL OPERATING WATER LEVEL

NOTES

1. SURVEY PROVIDED BY DP&L. THE TOPOGRAPHY FROM 2013 SURVEY WAS COMBINED WITH POND BATHYMETRY (POND 7 FROM 2012, POND 10 FROM 2013, PONDS 3A, 5, 6 FROM 2014).

0 200
SCALE IN FEET

HALEY ALDRICH

DAYTON POWER & LIGHT COMPANY
J.M. STUART STATION
ABERDEEN, OHIO

POND 10
SITE PLAN

SCALE: AS SHOWN
OCTOBER 2016

FIGURE 1

VARI, KATALIN Printed: 3/23/2016 2:50 PM Layout: P10
G:\40373_DP&L\CAD-JMSS\GLOBAL\FIGURES\INFLOW FLOOD CONTROL PLAN\40373_FIG-1_PONDS SITE PLANS.DWG

Summary for Subcatchment P10S: Pond 10 Subcatchment

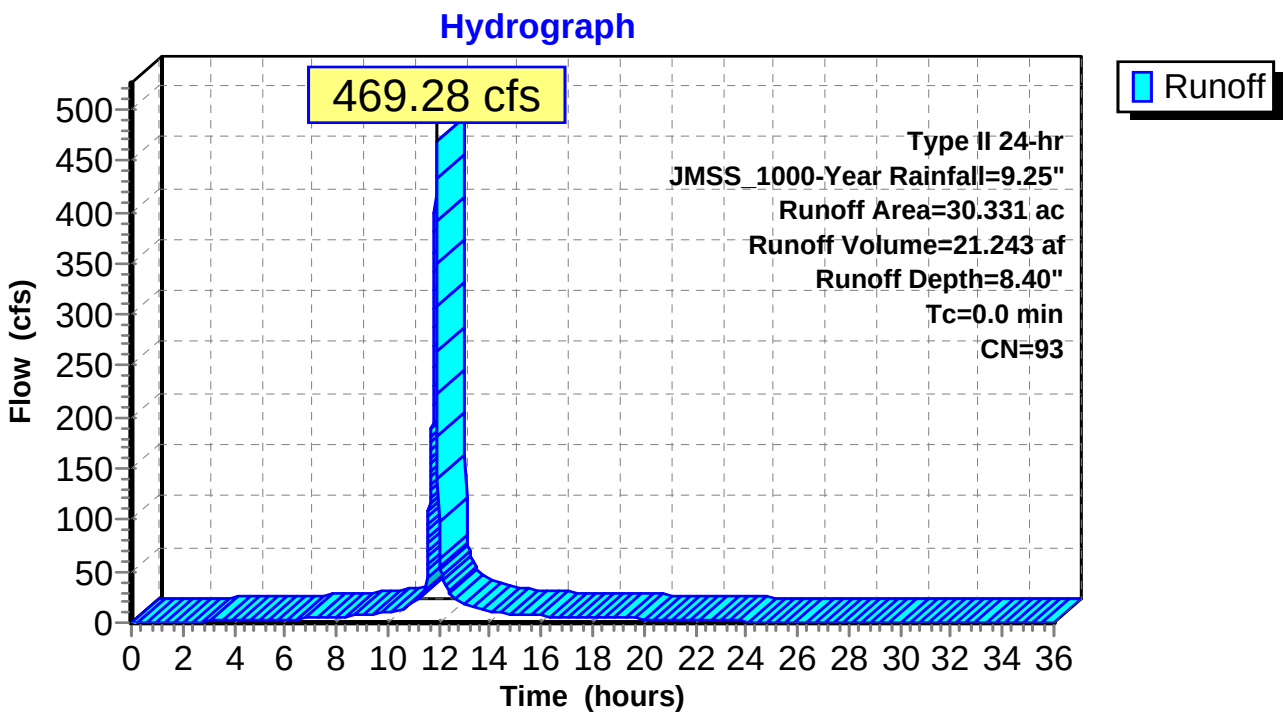
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 469.28 cfs @ 11.90 hrs, Volume= 21.243 af, Depth= 8.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr JMSS_1000-Year Rainfall=9.25"

Area (ac)	CN	Description
24.592	98	Water Surface, HSG B
5.739	69	Pasture/grassland/range, Fair, HSG B
30.331	93	Weighted Average
5.739		18.92% Pervious Area
24.592		81.08% Impervious Area

Subcatchment P10S: Pond 10 Subcatchment



APPENDIX 3.
Excerpt from:
Engineering Design Report, Ash Pond #10
By URS Corporation, Dated 2 July 1999
Pages 1-3, Figure 3, Table A-1, Figure A-1 & A-2

ENGINEERING DESIGN REPORT

ASH POND #10
DP&L J.M. STUART STATION
ABERDEEN, OHIO

Prepared for:
Dayton Power & Light
745 U.S. 52
Aberdeen, Ohio 45101

July 2, 1999

URS GREINER WOODWARD CLYDE

30775 Bainbridge Road
Suite 200
Solon, Ohio 44139
(V) 440.349.2708
(F) 440.349.1514
Project No. 38-8E06133.00

1. INTRODUCTION

The Dayton Power & Light Company (DP&L) is currently planning to expand their on-site storage and disposal of non-toxic fly ash produced at the JM Stuart Electrical Generating Station located in Aberdeen, Ohio. The expansion is part of DP&L's long-term storage and disposal program and will incorporate the existing ash ponds and dry landfill (Landfill No. 9), which are currently permitted by the Ohio Environmental Protection Agency (OEPA).

Combustion of coal at the power generating station produces non-toxic fly ash and bottom ash. The fly ash is mixed with water to create a slurry (to create sluiced ash) and pumped into the existing Ash Ponds (Pond 3A, 7, 8 West (8W) and 8 East (8E)). When the fly ash has settled, the water is decanted and treated at the pH treatment facility prior to discharge to the Ohio River. When the ponds are full, the fly ash is excavated from the ponds and placed in the dry landfill (Landfill 9). The bottom ash is trucked to the bottom ash stockpile (refer to Figure 2), and used as dust control in the ponds and landfill.

The ponds and landfill are currently being filled at a rate which will require DP&L to construct a new pond (proposed Pond 10), close ponds 8E and 8W, and construct a new dry landfill (future Landfill 11) on top of ponds 8E and 8W.

The following report summarizes engineering design analyses performed for the design, construction and operation of the proposed Pond 10, the focus of the current permit submittal.

2. EXISTING SITE CONDITIONS

Proposed Pond 10 will be situated west of existing Pond 8W. The approximately 30-acre site is currently undeveloped except for an abandoned plant access road, the existing plant access road and an existing underground potable water line (these facilities are scheduled to be relocated as part of the construction of Pond 10). The site is relatively level with a mean surface elevation of approximately 545 feet above mean sea level (ft msl). A plan view of the existing site features and proposed Pond 10 are shown on Figure 2.

Subsurface stratigraphy below the site is characterized by one to twelve feet of fine-grained deposits (CL, CL-ML, & ML) which are both alluvial and regraded materials. The fine-grained deposits are underlain by approximately 21 to 113 feet of coarse-grained alluvial deposits (SM, SP-SM, & SW-SM), which become more coarse, cleaner and more dense with depth, i.e. the very loose to medium dense SM deposits overlie the loose to very dense SP-SM and SW-SM deposits. The coarse-grained deposits are generally thinner at the north end of the site (near U.S. 52) grading to thicker deposits moving south toward the Ohio River. Shale and limestone

bedrock varies from approximately 35 feet below existing grade at the north end of the site to 122 feet below existing grade at the south end of the site. The static ground water table follows the coarse-grained aquifer and bedrock profiles; ground water was encountered at approximately 30 feet below existing grade at the north end of the site and 60 feet below grade at the south end of the site, during the subsurface investigation (February 1999).

A generalized cross section showing the subsurface conditions below Pond 10 is illustrated on Figure 3. Refer to the Geotechnical Summary Report and Hydrogeologic Summary Report for specific details of the existing subsurface conditions

3. PROPOSED ASH POND 10

The design and construction of Pond 10 includes construction of a new above-grade dike on the existing fine-grained surficial deposits. The top of the dike will coincide with existing Pond 8 West, i.e. elevation 569 ft msl±. This configuration will result in the dike being approximately 20 feet above existing grade.

The existing alluvial deposits will be excavated from the inside of the pond to approximate elevation 522 ft msl. The pond bottom will consist of an isolation layer, i.e. compacting 2 feet of the existing soils and placement of a 1.5 feet of clay, and a 1.5-foot clay liner. The average pond bottom elevation will be at approximate elevation 525 ft msl.

The above grade dike will consist of a Bottom Ash core, a 2-foot sand toe drain, a 1.5-foot clay liner on the inside of the dike, and a 1-foot vegetative cover on the outside of the dike.

A plan view of pond 10 is shown in Figure 2. A generalized cross section of the pond 10 dike is shown in Figure 3. Refer to the Civil Design Package and Geotechnical Summary Report for specific details regarding the existing subsurface conditions, proposed Pond 10 dike and bottom liner materials and the proposed Pond 10 configuration.

4. SCOPE OF DESIGN ANALYSES

The design analyses included herein incorporate the aforementioned generalized subsurface conditions and proposed improvements. As appropriate, variations in these parameters were included to model a "worst case" and "range" of conditions expected during design and operation of the proposed pond. Where construction and operation of proposed Pond 10 interacts with the existing site features and future Landfill 11, the design analyses include the additional considerations.

Design analyses were performed to identify the overall safety and integrity of Pond 10 and the existing/future site features, during construction and operation of Pond 10. The analyses were also performed to supplement the civil design. The analyses include the following:

- Slope Stability Analyses
- Steady State Seepage Analyses
- Settlement Analyses
- Material Compatibility Analyses of the Proposed Dike Materials
- Drainage Layer Analyses to Size the Sand Toe Drain
- Equivalency Analyses to Model the Pond Bottom Liner

The analyses are presented in the attached Appendices, which include a detailed discussion of the methodology employed in each respective analysis, the supporting calculations and the results of the analyses. A summary of findings from these analyses is presented below.

5. RESULTS OF DESIGN ANALYSES

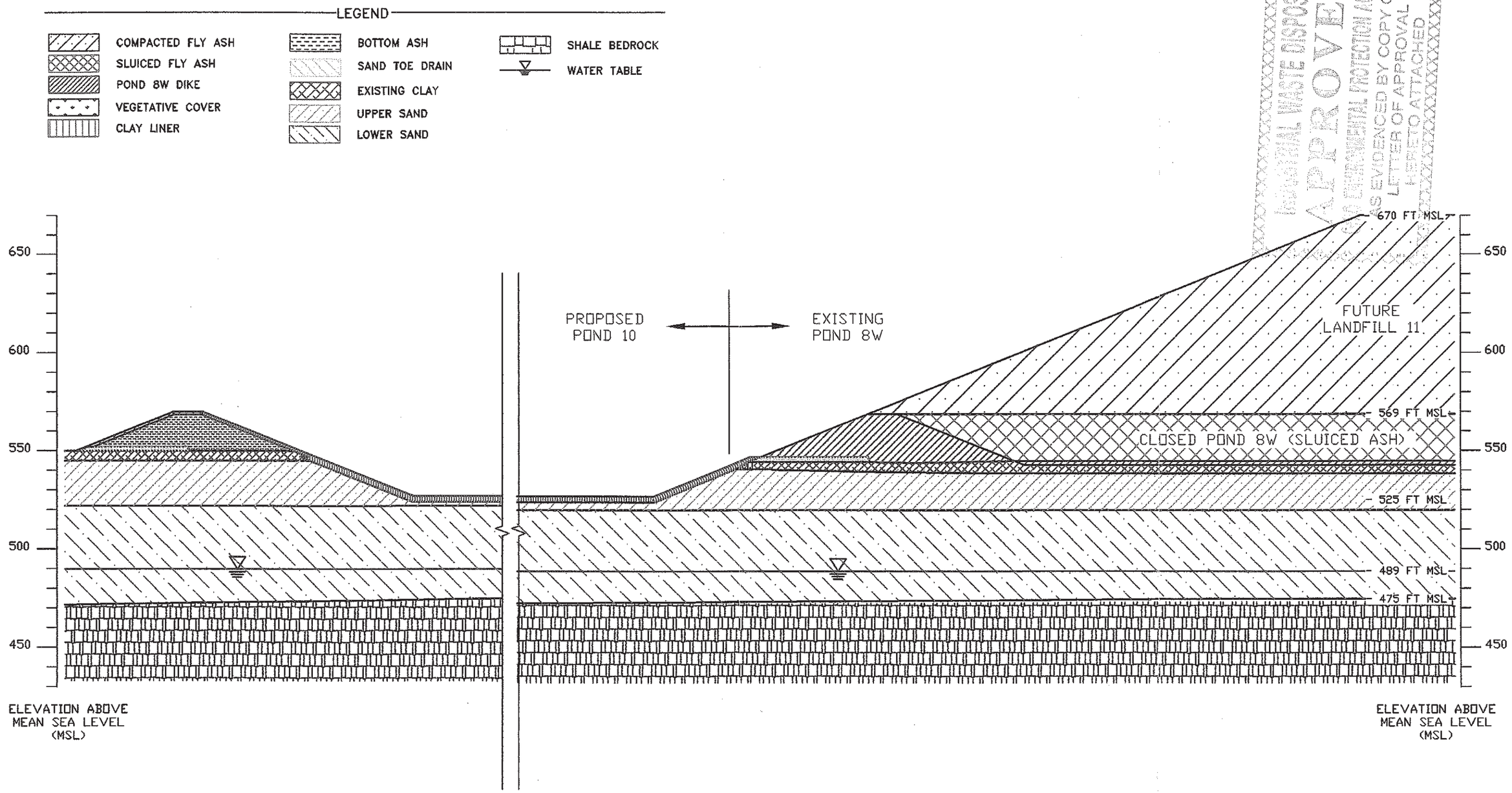
The analyses show that proposed Pond 10 and the existing/future site features will be stable during construction and operation of Pond 10. A summary of the results follows:

5.1 Slope Stability Analyses

Based on the configuration and operation of the new Pond 10, The slope stability analyses were performed for two critical cross-sections:

1. Proposed Pond 10 dike (Cross Section C-C');
2. Proposed Pond 10, existing Pond 8W, and future Landfill 11 (Cross Section D-D').

The results of the slope stability analyses for these two critical cross-sections show that the existing and proposed facilities are stable for both total and effective stress conditions, quick (or sudden) draw-down of Pond 10 and earthquake loading. Results of the analyses are shown in the following tables.



INDUSTRIAL WASTE DISPOSAL
APPROVED
OHIO ENVIRONMENTAL PROTECTION AGENCY
AS EVIDENCED BY COPY OF
LETTER OF APPROVAL
HERETO ATTACHED

0 25 50 100

APPROXIMATE SCALE IN FEET

GENERALIZED CROSS SECTION
PROPOSED POND 10
DP&L J.M. STUART STATION; ABERDEEN, OHIO

URS Greiner Woodward Clyde

DR. BY	VKG	SCALE	1" = 50'	DWG. NO.	PROFILE.DWG	PROJ. NO.	8E06133
CK'D. BY	MDR	DATE	JUNE 29, 1999			FIG. NO.	3

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TABLE A-1

Pond 10 Slope Stability Analysis

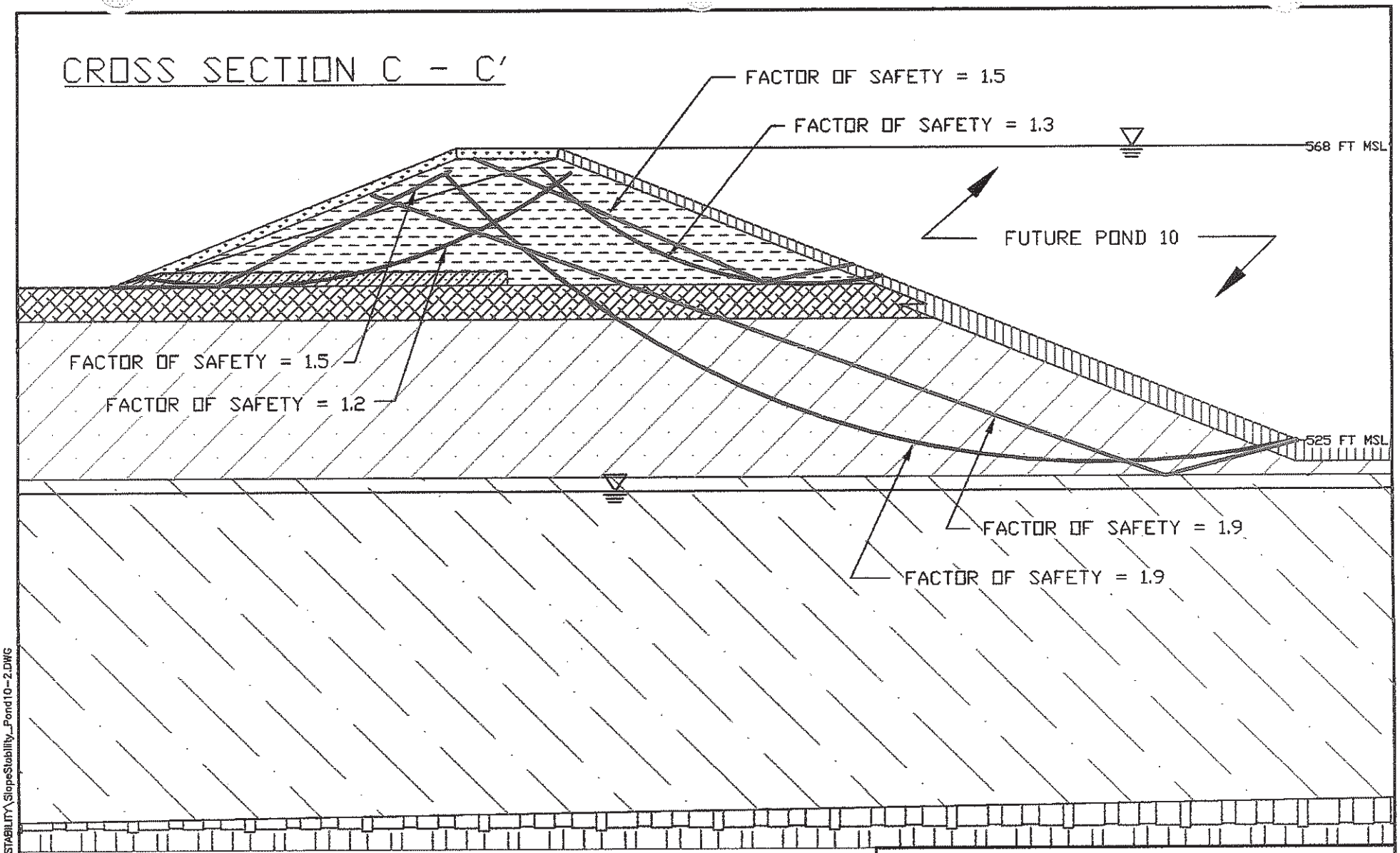
Material Properties For Existing and Proposed Soils

Pond 10 Dike (Cross Section C-C')					
Material Description	Total Unit Weight (pcf)	Cohesion		Friction Angle[2]	
		Total (psf)	Effective (psf)	Total (degrees)	Effective (degrees)
Vegetative Cover	125	1000	500	10	15
Clay Liner	125	1900	1500	0	10
Bottom Ash (Core)	85	0	/	/	45
Sand Drain	130	0	/	/	35
Existing Clay	130	1500	1000	0	10
Upper Sand	130	0	/	/	30
Lower Sand	135	0	/	/	35
Shale	140	4000	3000	25	30

Pond 10, Pond 8W, & Landfill 11 (Cross Section D-D')					
Material Description	Total Unit Weight (pcf)	Cohesion		Friction Angle[2]	
		Total (psf)	Effective (psf)	Total (degrees)	Effective (degrees)
Fly Ash (Future Landfill 11)	115	0	0	33	33
Sluiced Ash (Pond 8W)	80	750	500	30	30
Pond 8W Dike	130	3500	3000	0	10
Sand Drain (Pond 8W)	130	0	0	/	30
Existing Clay	130	1500	1000	0	10
Upper Sand	130	0	0	/	30
Lower Sand	135	0	0	/	35
Shale	140	4000	3000	30	30

Notes:

1. The material properties of all existing soil deposits and proposed dike materials are based on the field and laboratory testing presented in the Geotechnical Summary Report.
2. Free draining materials are modeled with effective stress parameters.



LEGEND

- VEGETATIVE COVER
- CLAY LINER
- BOTTOM ASH
- SAND TOE DRAIN
- WATER TABLE
- EXISTING CLAY
- UPPER SAND
- LOWER SAND
- SHALE
- CRITICAL FAILURE CIRCLE
- CRITICAL FAILURE WEDGE

0 10 20 40

APPROXIMATE SCALE IN FEET

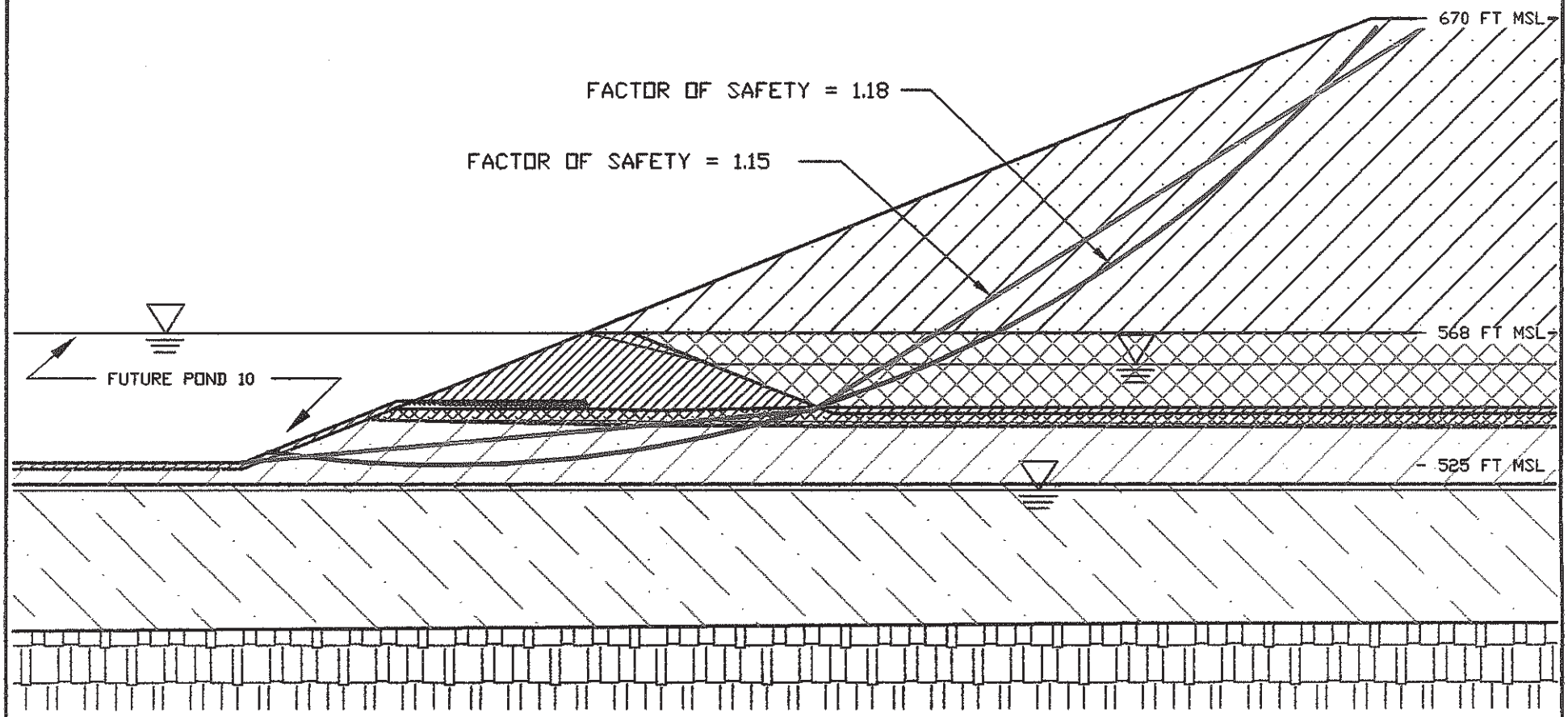
RESULTS OF SLOPE STABILITY ANALYSIS
PROPOSED DIKE FOR POND 10
DP&L J.M. STUART STATION; ABERDEEN, OHIO

URS Greiner Woodward Clyde

DR. BY	VKG	SCALE	1" = 20'	DWG. NO.	SlopeStability_Pond10-2.dwg	PROJ. NO.	8E06133
CK'D. BY	MDR	DATE	JUNE 22, 1999			FIG. NO.	A-1

Q:\8E06133\GEOTECH\SLOPESTABILITY\SlopeStability_Pond10-2.DWG

CROSS SECTION D - D'



LEGEND

- COMPACTED FLY ASH
- SLUISHED FLY ASH
- POND 8W DIKE
- EXISTING CLAY
- SAND TOE DRAIN
- UPPER SAND
- LOWER SAND
- SHALE BEDROCK
- WATER TABLE
- CRITICAL FAILURE CIRCLE
- CRITICAL FAILURE WEDGE

0 25 50 100

APPROXIMATE SCALE IN FEET

RESULTS OF SLOPE STABILITY ANALYSIS
POND 8W, POND 10, AND LANDFILL 11
DP&L J.M. STUART STATION; ABERDEEN, OHIO

URS Greiner Woodward Clyde

DR. BY	VKG	SCALE	1" = 50'	DWG. NO. 3AR-2.DWG	PROJ. NO. 8E06133
CK'D. BY	MDR	DATE	JUNE 23, 1999	FIG. NO.	A-2

Q:\8E06133\SLOPESTABILITY\3AR-2.DWG

APPENDIX 4.1
Excerpt from:
Engineering Design Report, Ash Pond #10
By URS Corporation, Dated 2 July 1999
Pages 1-3, Figure 3, Table A-1, Figure A-1 & A-2

ENGINEERING DESIGN REPORT

ASH POND #10
DP&L J.M. STUART STATION
ABERDEEN, OHIO

Prepared for:
Dayton Power & Light
745 U.S. 52
Aberdeen, Ohio 45101

July 2, 1999

URS GREINER WOODWARD CLYDE

30775 Bainbridge Road
Suite 200
Solon, Ohio 44139
(V) 440.349.2708
(F) 440.349.1514
Project No. 38-8E06133.00

1. INTRODUCTION

The Dayton Power & Light Company (DP&L) is currently planning to expand their on-site storage and disposal of non-toxic fly ash produced at the JM Stuart Electrical Generating Station located in Aberdeen, Ohio. The expansion is part of DP&L's long-term storage and disposal program and will incorporate the existing ash ponds and dry landfill (Landfill No. 9), which are currently permitted by the Ohio Environmental Protection Agency (OEPA).

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The ponds and landfill are currently being filled at a rate which will require DP&L to construct a new pond (proposed Pond 10), close ponds 8E and 8W, and construct a new dry landfill (future Landfill 11) on top of ponds 8E and 8W.

The following report summarizes engineering design analyses performed for the design, construction and operation of the proposed Pond 10, the focus of the current permit submittal.

2. EXISTING SITE CONDITIONS

Proposed Pond 10 will be situated west of existing Pond 8W. The approximately 30-acre site is currently undeveloped except for an abandoned plant access road, the existing plant access road and an existing underground potable water line (these facilities are scheduled to be relocated as part of the construction of Pond 10). The site is relatively level with a mean surface elevation of approximately 545 feet above mean sea level (ft msl). A plan view of the existing site features and proposed Pond 10 are shown on Figure 2.

Subsurface stratigraphy below the site is characterized by one to twelve feet of fine-grained deposits (CL, CL-ML, & ML) which are both alluvial and regraded materials. The fine-grained deposits are underlain by approximately 21 to 113 feet of coarse-grained alluvial deposits (SM, SP-SM, & SW-SM), which become more coarse, cleaner and more dense with depth, i.e. the very loose to medium dense SM deposits overlie the loose to very dense SP-SM and SW-SM deposits. The coarse-grained deposits are generally thinner at the north end of the site (near U.S. 52) grading to thicker deposits moving south toward the Ohio River. Shale and limestone

bedrock varies from approximately 35 feet below existing grade at the north end of the site to 122 feet below existing grade at the south end of the site. The static ground water table follows the coarse-grained aquifer and bedrock profiles; ground water was encountered at approximately 30 feet below existing grade at the north end of the site and 60 feet below grade at the south end of the site, during the subsurface investigation (February 1999).

A generalized cross section showing the subsurface conditions below Pond 10 is illustrated on Figure 3. Refer to the Geotechnical Summary Report and Hydrogeologic Summary Report for specific details of the existing subsurface conditions

3. PROPOSED ASH POND 10

The design and construction of Pond 10 includes construction of a new above-grade dike on the existing fine-grained surficial deposits. The top of the dike will coincide with existing Pond 8 West, i.e. elevation 569 ft msl±. This configuration will result in the dike being approximately 20 feet above existing grade.

The existing alluvial deposits will be excavated from the inside of the pond to approximate elevation 522 ft msl. The pond bottom will consist of an isolation layer, i.e. compacting 2 feet of the existing soils and placement of a 1.5 feet of clay, and a 1.5-foot clay liner. The average pond bottom elevation will be at approximate elevation 525 ft msl.

The above grade dike will consist of a Bottom Ash core, a 2-foot sand toe drain, a 1.5-foot clay liner on the inside of the dike, and a 1-foot vegetative cover on the outside of the dike.

A plan view of pond 10 is shown in Figure 2. A generalized cross section of the pond 10 dike is shown in Figure 3. Refer to the Civil Design Package and Geotechnical Summary Report for specific details regarding the existing subsurface conditions, proposed Pond 10 dike and bottom liner materials and the proposed Pond 10 configuration.

4. SCOPE OF DESIGN ANALYSES

The design analyses included herein incorporate the aforementioned generalized subsurface conditions and proposed improvements. As appropriate, variations in these parameters were included to model a "worst case" and "range" of conditions expected during design and operation of the proposed pond. Where construction and operation of proposed Pond 10 interacts with the existing site features and future Landfill 11, the design analyses include the additional considerations.

Design analyses were performed to identify the overall safety and integrity of Pond 10 and the existing/future site features, during construction and operation of Pond 10. The analyses were also performed to supplement the civil design. The analyses include the following:

- Slope Stability Analyses
- Steady State Seepage Analyses
- Settlement Analyses
- Material Compatibility Analyses of the Proposed Dike Materials
- Drainage Layer Analyses to Size the Sand Toe Drain
- Equivalency Analyses to Model the Pond Bottom Liner

The analyses are presented in the attached Appendices, which include a detailed discussion of the methodology employed in each respective analysis, the supporting calculations and the results of the analyses. A summary of findings from these analyses is presented below.

5. RESULTS OF DESIGN ANALYSES

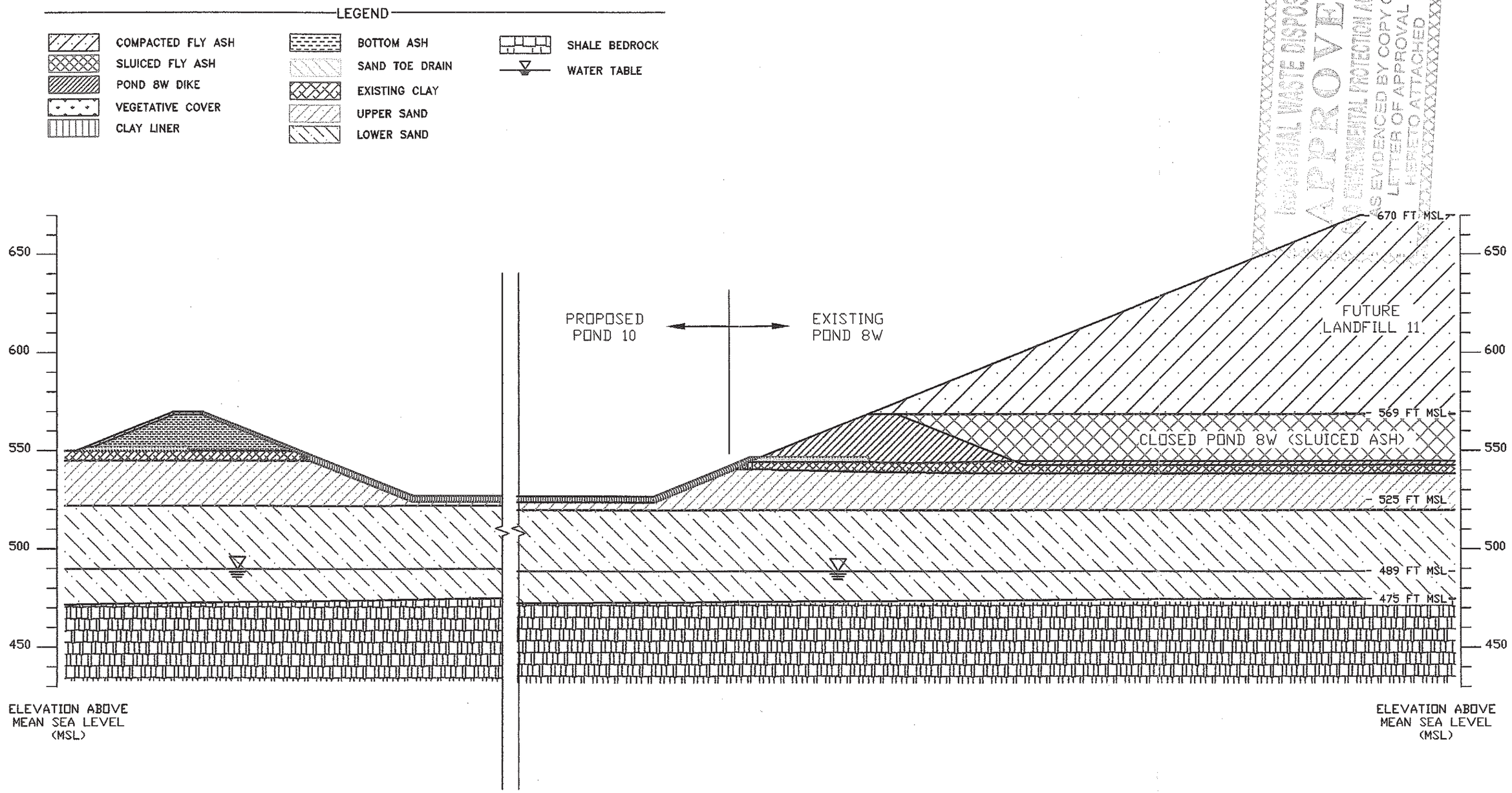
The analyses show that proposed Pond 10 and the existing/future site features will be stable during construction and operation of Pond 10. A summary of the results follows:

5.1 Slope Stability Analyses

Based on the configuration and operation of the new Pond 10, The slope stability analyses were performed for two critical cross-sections:

1. Proposed Pond 10 dike (Cross Section C-C');
2. Proposed Pond 10, existing Pond 8W, and future Landfill 11 (Cross Section D-D').

The results of the slope stability analyses for these two critical cross-sections show that the existing and proposed facilities are stable for both total and effective stress conditions, quick (or sudden) draw-down of Pond 10 and earthquake loading. Results of the analyses are shown in the following tables.



INDUSTRIAL WASTE DISPOSAL
APPROVED
OHIO ENVIRONMENTAL PROTECTION AGENCY
AS EVIDENCED BY COPY OF
LETTER OF APPROVAL
HERETO ATTACHED

0 25 50 100

APPROXIMATE SCALE IN FEET

GENERALIZED CROSS SECTION
PROPOSED POND 10
DP&L J.M. STUART STATION; ABERDEEN, OHIO

URS Greiner Woodward Clyde

DR. BY	VKG	SCALE	1" = 50'	DWG. NO.	PROFILE.DWG	PROJ. NO.	8E06133
CK'D. BY	MDR	DATE	JUNE 29, 1999			FIG. NO.	3

U:\8E06133\GEOTECH\PROFILE.DWG

TABLE A-1

Pond 10 Slope Stability Analysis

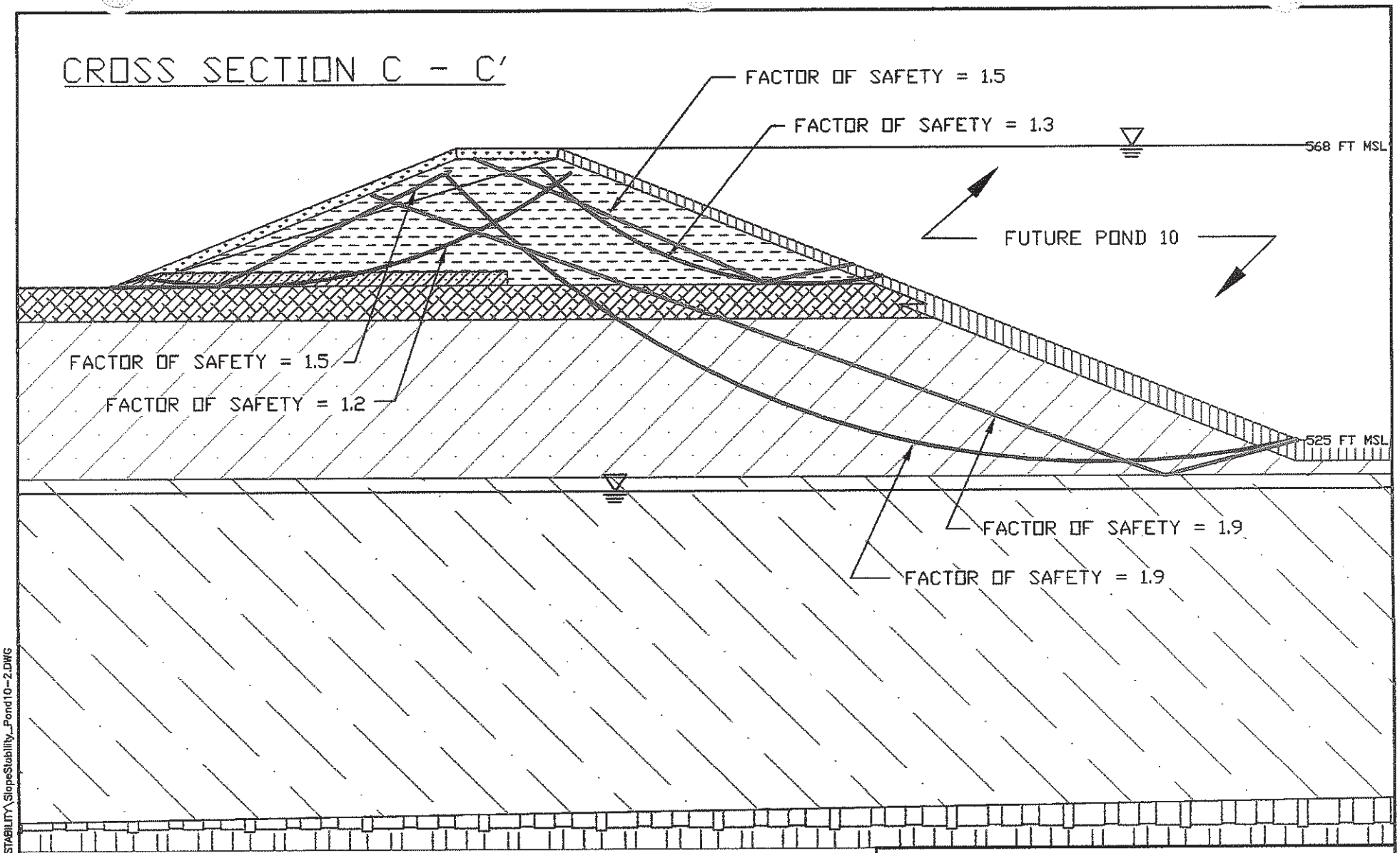
Material Properties For Existing and Proposed Soils

Pond 10 Dike (Cross Section C-C')					
Material Description	Total Unit Weight (pcf)	Cohesion		Friction Angle[2]	
		Total (psf)	Effective (psf)	Total (degrees)	Effective (degrees)
Vegetative Cover	125	1000	500	10	15
Clay Liner	125	1900	1500	0	10
Bottom Ash (Core)	85	0	/	/	45
Sand Drain	130	0	/	/	35
Existing Clay	130	1500	1000	0	10
Upper Sand	130	0	/	/	30
Lower Sand	135	0	/	/	35
Shale	140	4000	3000	25	30

Pond 10, Pond 8W, & Landfill 11 (Cross Section D-D')					
Material Description	Total Unit Weight (pcf)	Cohesion		Friction Angle[2]	
		Total (psf)	Effective (psf)	Total (degrees)	Effective (degrees)
Fly Ash (Future Landfill 11)	115	0	0	33	33
Sluiced Ash (Pond 8W)	80	750	500	30	30
Pond 8W Dike	130	3500	3000	0	10
Sand Drain (Pond 8W)	130	0	0	/	30
Existing Clay	130	1500	1000	0	10
Upper Sand	130	0	0	/	30
Lower Sand	135	0	0	/	35
Shale	140	4000	3000	30	30

Notes:

1. The material properties of all existing soil deposits and proposed dike materials are based on the field and laboratory testing presented in the Geotechnical Summary Report.
2. Free draining materials are modeled with effective stress parameters.



LEGEND

- VEGETATIVE COVER
- CLAY LINER
- BOTTOM ASH
- SAND TOE DRAIN
- WATER TABLE
- EXISTING CLAY
- UPPER SAND
- LOWER SAND
- SHALE
- CRITICAL FAILURE CIRCLE
- CRITICAL FAILURE WEDGE

0 10 20 40

APPROXIMATE SCALE IN FEET

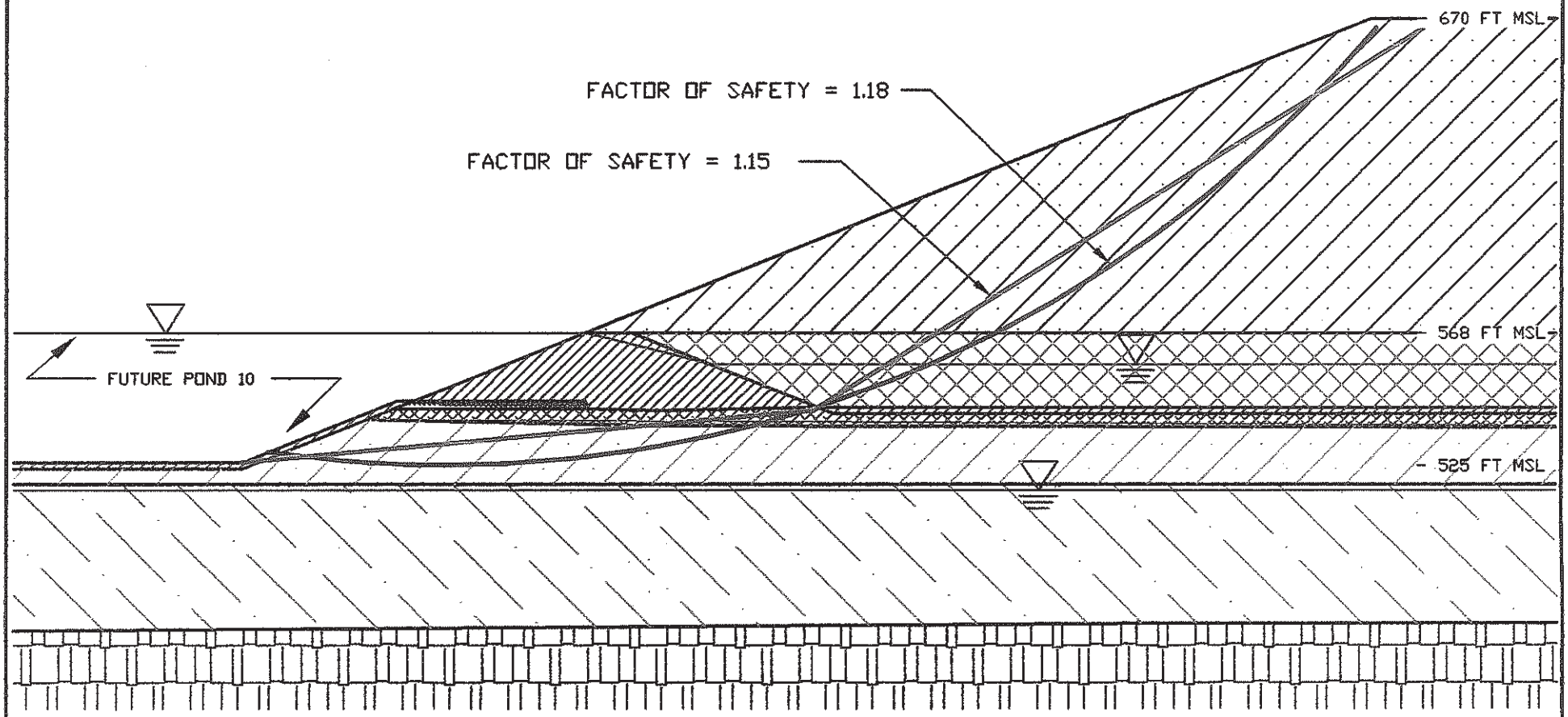
RESULTS OF SLOPE STABILITY ANALYSIS
PROPOSED DIKE FOR POND 10
DP&L J.M. STUART STATION; ABERDEEN, OHIO

URS Greiner Woodward Clyde

DR. BY	VKG	SCALE	1" = 20'	DWG. NO.	SlopeStability_Pond10-2.dwg	PROJ. NO.	8E06133
CK'D. BY	MDR	DATE	JUNE 22, 1999			FIG. NO.	A-1

Q:\8E06133\GEOTECH\SLOPESTABILITY\SlopeStability_Pond10-2.DWG

CROSS SECTION D - D'



LEGEND

- COMPACTED FLY ASH
- SLUISHED FLY ASH
- POND 8W DIKE
- EXISTING CLAY
- SAND TOE DRAIN
- UPPER SAND
- LOWER SAND
- SHALE BEDROCK
- WATER TABLE
- CRITICAL FAILURE CIRCLE
- CRITICAL FAILURE WEDGE

0 25 50 100

APPROXIMATE SCALE IN FEET

RESULTS OF SLOPE STABILITY ANALYSIS
POND 8W, POND 10, AND LANDFILL 11
DP&L J.M. STUART STATION; ABERDEEN, OHIO

URS Greiner Woodward Clyde

DR. BY	VKG	SCALE	1" = 50'	DWG. NO. 3AR-2.DWG	PROJ. NO. 8E06133
CK'D. BY	MDR	DATE	JUNE 23, 1999	FIG. NO.	A-2

Q:\8E06133\SLOPESTABILITY\3AR-2.DWG

APPENDIX 4.2
Excerpt from:
Permit to Installation Application, Dayton Power and Light, J.M. Stuart Electric Generating Station, Fly Ash Pond 10, Volumes 1 and 2
By URS Greiner Woodward Clyde, Dated 2 July 1999
Section 02290 and 02220

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ASH POND #10: DP&L J.M. STUART STATION
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THE DAYTON POWER &LIGHT CO.: BID DOCUMENT NO.

TECHNICAL SPECIFICATIONS

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01010 SUMMARY OF WORK

DIVISION 2 - SITEWORK

02050 DEMOLITION
02110 CLEARING AND GRUBBING
02220 EXCAVATION AND BACKFILL
02225 DUST CONTROL
02275 RIPRAP
02290 EARTH DIKES
02600 CORRUGATED METAL PIPE
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02611 HIGH DENSITY POLYETHYLENE PIPING
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SECTION 02290

EARTH DIKES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Stripping.

B. Excavation for embankment foundation.

C. Construction materials for the various zones of the dike embankment.

D. Borrow.

E. Placement of embankment materials.

F. Proof rolling foundation subgrade.

1.2 RELATED SECTIONS

A. Section 02110 - Clearing and Grubbing

1.3 REFERENCES

A. ASTM C 88 - Test Method for Soundness of Aggregates by use of Sodium Sulphate or Magnesium Sulphate.

B. ASTM C 127 - Test Method for Specific Gravity and Absorption of Coarse Aggregate.

C. ASTM C 136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

D. ASTM D 75 - Practice for Sampling Aggregates.

E. ASTM D 422 - Method for Particle-Size Analysis of Soils.

F. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.

G. ASTM D 1140 - Test Method for Amount of Material in Soils Finer than the No. 200 Sieve.

H. ASTM D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

I. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

J. ASTM D 2216 - Method for Laboratory Determination of Water Moisture Content of Soil, Rock, and Soil-Aggregate Mixtures.

K. ASTM D 2487 - Classification of Soils for Engineering Purposes.

L. ASTM D 2992 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

M. ASTM D 3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

N. ASTM D 4253 - Test Methods for Maximum Index Density of Soils Using Vibratory Table.

O. ASTM D 4254 - Test Methods for Minimum Index Density of Soil and Calculation of Relative Density.

P. ASTM D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

Q. ASTM C 131 - Los Angeles Abrasion Test.

1.4 DEFINITIONS

A. "Embankment" or "dike embankment": All portions of the dike embankment: Upstream Shell, Downstream Shell, Slope Protection, Core Material, Drain Material, Filter Material, Structural Fill, and Gravel Surfacing.

B. Fines: Material passing the No. 200 sieve.

C. Suitable Material: Material imported or excavated from cut areas which meets the specification requirements for use in constructing fills.

D. Borrow: Material excavated on the site or taken from designated borrow areas.

E. Well-Graded: A mixture of particle sizes that has no specific concentration, or lack thereof, of one or more sizes. A material type that, when compacted, produces a strong and relatively incompressible soil mass with a minimum of voids.

F. Topsoil: Native surface soil capable of supporting native plant growth.

G. Coverage: One coverage is defined as the result of successive passes by a piece of compaction equipment, which by means of sufficient overlap, will ensure that all areas of the layer or lift being compacted have been subjected to one pass of the compaction equipment.

H. Optimum Moisture Content The moisture content that will result in a maximum dry unit weight of soil when subjected to the ASTM D 698 or ASTM D1557 compaction test.

I. Percent Compaction: The percent compaction in place shall be calculated as the ratio (in percent) of the in place dry density to the estimated maximum dry density, in accordance with ASTM D698 or ASTM D1557, of the representative fill material at the location of the in-place density test.

J. Proof Rolling: Rolling a soil or rock surface with a minimum of 4 passes with approved compaction equipment for the purpose of detecting soft or loose areas.

K. Unsuitable Materials: Materials that contain waste, debris, roots, organic matter, frozen matter, stone or rock with any dimension greater than 6 inches, or any other materials determined by the Owner to not meet the specifications for any embankment zone or required fill.

1.5 SUBMITTALS

A. Pre-construction Submittals: Submit in accordance with Division 1. A construction plan for each earthwork activity, at least thirty (30) days in advance of the start of each earthwork activity covered in this section. The plan must be approved by the Owner prior to any earthwork activities. The construction plan shall, at a minimum, include the following:

1. Proposed soil processing, placement, compaction, and moisture control equipment, including:

   a. Equipment catalog with weight, dimensions, and operating data.

2. Proposed work schedule.

3. Proposed methods of protecting work, to include temporary dewatering, drainage, irrigating and moisture conditioning, and frost protection measures.

4. Proposed excavation, stockpiling, regrading and staging plan describing handling and transport of on-site and off-site materials.

B. Source Quality Control Submittals

1. Five days prior use submit bulk samples (3-5 gallon buckets properly sealed) of borrow source materials to the Owner for approval.

C. Drain Placement Plan

1. Develop and submit a placement plan for the drain material to the Owner for approval. This submittal shall detail the Contractor's equipment, and methods proposed for spreading, placement and compaction of the above items that limits waste of these materials.

D. Greenlee Tract Borrow Area Plan

Submit a plan detailing the methods for removing embankment material from the Greenlee Tract borrow area to the Owner for approval. Include:

1. Measures to be taken to protect Environmental Quality.

2. Methods of transporting (conveying or hauling) material including proposed haul routes.

3. Borrow processing means and methods.

4. Plan and sequencing for borrow excavation including the extent and quantity of excavation, excavation schedule.

5. Reclamation plan for borrow area (including slopes and contours) and all access and transport corridors.

1.6 SEQUENCING AND SCHEDULING

A. Give advance notice to the Owner at least 24 hours prior to sampling materials for potential use in work.

B. Notify Owner at least 24 hours prior to commencement ofproof-rolling.

C. Give advance notice of at least 24 hours to Owner when ready for compaction or subgrade testing and inspection.

1.7 PROJECT/SITE CONDITIONS

A. Existing Conditions.

1. Exploratory investigations are not sufficiently complete to disclose all defects that may exist in the foundation and that will be encountered during construction.

2. Final excavation lines will be determined by the Engineer in the field based on the conditions encountered, and may not be the same as the estimated excavation lines shown on the Drawings.

3. Final excavation lines will in all cases be determined by the Engineer.

PART 2 PRODUCTS

2.1 EMBANKMENT MATERIAL (ZONE 1)

A. Embankment material shall be obtained from the designated bottom ash stockpile shown on the Drawings. The contractor shall submit all material for the Zone 1 to the Owner for approval prior to stock piling and use.

2.2 CLAY LINER MATERIAL (ZONE 2)

A. Clay Liner Material shall be obtained from borrow sources designated byth Owner.

B. Zone 2 material shall consist of inorganic lean clay (CL) with a maximum size of 3/8" inches and a minimum of 60 percent passing the number 200 sieve size. The contractor shall submit all material for the Zone 2 to the Owner for approval prior to stock piling and use.

2.3 ISOLATION LAYER – EXISTING SANDS COMPACTED IN PLACE AND LEAN CLAY (ZONE 3)

A. Zone 3 (isolation layer) consists of existing silt sands (SM) and poor graded to well graded sands with silt (SP-SM, SN-SM), compacted inplace underlying the inorganic lean clay (CL). The contractor shall submit all material for the Zone 3 to the Owner for approval prior to stock piling and use.

2.4 DRAIN MATERIAL (ZONE 4)

A. Drain materials shall be obtained from the Pond 10 excavation, or off-site sources approved by the Owner prior to delivery to site.

1. The drain (Zone 4) material shall consist of free draining, poorly graded to well graded sands with silt (SP-SM or SW-SM) with a maximum size 1.5 inches and no more than 8% passing the no. 200 sieve. The contractor shall submit all material for the Zone 4 to the Owner for approval prior to stock piling and use.

2.5 VEGETATIVE LAYER (ZONE 5)

A. Vegetative layer materials shall be obtained from the Pond 10 excavation.

B. The Zone 5 material shall be topsoil blended with silty and clayey sands capable of sustaining vegetative growth

2.7 COMPACTION EQUIPMENT

A. General: Compaction equipment shall conform to the manufacturer's specifications and shall be maintained in good working condition at all times.

B. Zones 1 through 4 - Compaction equipment shall be appropriate so as to achieve the required densities.

1. All equipment and tools used in the performance of the Work are to be approved by the Owner before work is started.

2. Operate and maintain compaction equipment in accordance with the manufacturer's instructions and recommendations. Provide compaction passes as necessary to achieve specified densities.

3. Provide equipment for applying water of a type and quality adequate for the work, free of leaks and equipped with a distributor bar or other approved device to ensure uniform application.

4. Provide processing equipment for producing the various zones of embankment material from designated borrow areas. or approved off-site borrow sources.

C. Zone 3 - Compaction equipment shall be appropriate so as to achieve the required densities to achieve densification of a nominal two foot thickness of the upper inplace sands.

D. Special Compaction: Use hand operated power tampers equal to a Wacker Model GVR 200Y or other special compaction equipment acceptable to the Owner adjacent to the outlet structure, the outlet pipe, in restricted spaces, in backfilling instrumentation trenches and in any location where other compactors cannot operate effectively.

E. Discing Equipment: Use discing equipment to break up, blend, or moisture condition materials as needed. Disc shall have a minimum of two gangs hooked together in tandem and shall be sized to penetrate a minimum fill lift of 8 inches. The width of cut shall not be less than 12 feet. Disc blades shall be notched, spaced a minimum of 16-5/16 inches, and have a minimum diameter of 36 inches. The disc shall be equipped with self cleaning scrapers to prevent the accumulation of materials between and on the discs. Maintain disk serrations at all times in such condition as to provide efficient breaking and blending of the materials. In no case, however, shall the depth of the disc serrations be allowed to wear down to less than 50 percent of their depth when new, prior to being restored and replaced.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions

1. Prior to placing material in any section of the embankment, verify that the foundation for that section has been cleared, stripped, and dewatered. No material will be placed without approval of the foundation from the Owner.

2. Scarify soil foundation areas so that the surface materials will bond and compact with the first layer of fill. Scarification will consist of discing material 2 to 4 inches in depth such that no smooth surfaces are present.

3. Do not place frozen materials or place fill on frozen ground.

B. Equipment

1. Refer to Section 2.7.

3.2 EXCAVATION

A. Excavate according to the lines shown on the Drawings or field clarification provided by the Owner.

B. The required excavation lines shown on the Drawings shall not be interpreted as indicating the final or actual depths. Final excavation lines shall be in all cases as determined by the Owner.

C. Perform stripping of the embankment foundation area to the depths required to remove vegetative matter, roots, and other perishable, loose or objectionable materials that might interfere with the bonding of the embankment with the foundation, the bonding of embankment lifts, the compacting of materials, or that the Engineer determines to otherwise objectionable.

D. Transport stripped materials to waste or stockpile areas approved by the Owner.

E. Excess excavation and excavations made for the convenience of the Contractor for any purpose or reason shall not be paid for and shall be backfilled at no expense to the Owner.

F. Take precautions to preserve, in a sound condition, the material below and beyond the lines of all excavations.

G. Perform operations so that the excavations will yield as much suitable material for construction purposes as practicable.

H. As much as practical, re-use all suitable materials from required excavations in the permanent construction.

I. Separate suitable materials for construction purposes from materials to be wasted and to the extent practical, minimize handling by placing suitable materials directly in the designated final locations.

J. It may be feasible at times to transport a portion of the materials which are excavated for other parts of the work, and which are suitable for embankment construction, directly to the embankment at the time of excavation. It should be assumed that in most cases it will be necessary for such excavation materials to be deposited in temporary stockpiles prior to being placed in the embankment.

K. Aerate (and moisture condition) excavated materials which are suitable for the liner/isolation layer, but which when excavated are too wet for immediate compaction in the vegetative layer, until the moisture content is reduced sufficiently to permit them to be placed in the vegetative layer.

L. Level and trim waste piles to reasonably regular lines, and slope to drain.

3.3 PREPARATION

A. Foundation Preparation.

1. Proof roll all subgrades with a minimum of 4 passes of approved compaction equipment. Excavate soft/yielding subgrade as determined by the Engineer and replace with the appropriate compacted embankment fill material for the location in the foundation and adjacent embankment zone.

2. The compacted surface of any layer of fill which is too wet or too dry for bonding to the next layer of material shall be dried or moistened and compacted before the next layer is placed.

3. Conform to the grades and cross-sections shown on the Drawings and written field clarifications by Engineer.

4. Prior to placement of fill grade areas to lines and grades shown on the drawings.

5. Moisten earth-excavated surfaces upon or against which concrete is to be placed with water, and tamp or roll to form a firm foundation upon which to place concrete.

3.4 TEST FILLS FOR ZONE 1

A. The placement and compaction specifications for the bottom ash embankment layer (Zone 1) material may be modified based on the results of the required test fill. The test fill shall be constructed at least 5 days prior to placement of Zone 1. The test fill will be, at a minimum, 30 feet wide by 100 feet long. The test fill will be used to evaluate the

maximum field dry density obtainable with the specified equipment and relationships between effort and density for the specified equipment and materials.

B. Test fill material will be taken from the existing stockple of bottom ash designated on the plans. If, in the opinion of the Owner, materials found in these areas differ substantially, additional test fills may be required with such materials.

C. The test fill location may be within the limits of the dike embankment, at a location approved by the Owner. The test fill shall be underlain by 2 lifts of Zone 1 fill placed in 12-inch loose lifts and compacted by a minimum of 8 passes per lift of a Caterpillar Model 825C or equivalent self-propelled compactor. The second lift shall be compacted until settlement is negligible as judged by the Owner. A minimum of 3 smooth drum vibratory compactors shall also be used to compact the test fill. Following preparation of the test fill foundation, each of the three alternative compactors will work one quadrant of the test fill.

D. The test fill will be constructed with 12-inch loose lifts, using the placement procedure described in Section 3.6.B. Rocks larger than 6 inches shall be removed from the test fill and placed near the limits of the embankment.

E. The compaction characteristics of the test fill will be evaluated by the Owner. Before placement of each lift and after 4, 8 and 12 passes of each compactor on each lift; density test readings will be made by the Owner on the current and previous lift. A minimum of 3 lifts will be constructed. The Engineer will evaluate the test fill and determine acceptable equipment and number of passes required for fill compaction.

F. After the test fill has been completed, excavate through the test fill at a locations designated by the Owner. A backhoe will be used for excavation. The excavated face shall be hand-cleaned to expose undisturbed, compacted material. The excavation will provide a visual observation to assist in interpretation of test fill results by the Owner. The excavation will be backfilled and compacted after completion of excavation, and Owners evaluation of the test fill.

3.5 TEST FILLS FOR ZONE 2 AND THE CLAY PORTION OF ZONE 3

A. The placement and compaction specifications for the liner layer (Zones 2 and The Clay Portion of Zone 3) material may be modified based on the results of the required test fill. The test fill shall be constructed at least 5 days prior to placement. The test fill will be, at a minimum width three times the width of compaction equipment, and a minimum length three times the length of compaction equipment, including power equipment and any attachments. The test fill will be used to evaluate the maximum field dry density obtainable with the specified equipment and relationships between effort and density for the specified equipment and materials.

B. Test fill material will be taken from the designated borrow areas shown on the plans. If, in the opinion of the Owner, materials found in these areas differ substantially, additional test fills may be required.

C. The test fill location may be within the limits of the dike embankment, at a location approved by the Owner. The test fill shall be underlain by compacting the subgrade as directed by the Owner.

D. The test fill will be constructed with 8-inch loose lifts, using the placement procedure described in Section 3.6.C. Rocks larger than 6 inches shall be removed from the test fill.

E. The compaction characteristics of the test fill will be evaluated by the Owner. Before placement of each lift and after 4, 8 and 12 passes of each compactor on each lift; density test readings will be made by the Owner on the current and previous lift. A self-propelled compactor or dozer shall make one pass to level and smooth the layer prior to making the initial test readings. A minimum of 3 lifts will be constructed.

F. After the test fill has been completed, excavate through the test fill at a locations designated by the Owner. A backhoe will be used for excavation. The excavated face shall be hand-cleaned to expose undisturbed, compacted material. The excavation will provide a visual observation to assist in interpretation of test fill results by the Engineer. The excavation will be backfilled and compacted after completion of excavation, and Owners evaluation of the test fill.

3.6 PLACEMENT - Construct the dike embankment to the lines and grades shown on the Drawings, subject to the following:

A. General

1. Construct the embankment of suitable materials as specified.

2. Construct each layer of each zone of the dike embankment in a continuous and approximately horizontal layer for the full length and width of the dike embankment at the elevation of the layer.

3. The distribution and gradation of materials throughout the embankment shall be such that the embankment material will be free from lenses, pockets, streaks or layers of material differing substantially in texture or gradation from the surrounding material. The combined excavation and placing operations should be such that the embankment materials will be mixed and blended sufficiently to provide homogeneous section and best practical degree of compaction and stability.

4. Construction of the dike with a transverse surface through the embankment will be allowed only for haul and access road purposes. No other transverse bonding surfaces will be allowed in the dike. Construction of embankment fill for a "closure" section due to a diversion will be conducted by "stepping" into the slope of the embankment or foundation surface for each lift, to remove loose material and provide bonding. The amount of step required will be determined in the field by the Owner but shall be assumed to be no less than 2 feet.

5. Slopes of longitudinal surfaces (surfaces parallel to the dike axis) in the dike embankment between previously completed portions of the dike embankment and embankment to be placed, shall be no steeper than 3:1.

6. The locations of division lines between zones or portions of the embankment shall be maintained as close as practical to the lines and grades shown on the drawings. A maximum differential elevation of five feet between adjacent zones may be allowed.

7. Take special care to ensure bonding of new embankment to previously placed embankment by benching in 2 feet horizontally, except for drain or filter, as each layer is placed and compacted.

8. Moisten or aerate, scarify, and work with harrows, discs, or other suitable equipment in such a manner and to depths that provide a bonding surface with the new material and to remove all smooth surfaces.

B. Embankment Material (Zone 1)

1. The moisture content of the embankment material shall be distributed uniformly throughout each layer of material prior to and during compaction.

2. Materials too dry for compaction shall be prewetted. Supplemental water, if required, shall be added to the material on the embankment prior to compaction by uniform sprinkling followed by uniform mixing using discs and motor graders prior to compaction.

3. Materials too wet for compaction shall be dried to the proper moisture content before compaction.

4. Spread materials in layers not exceeding 12 inches in loose thickness and compact by rolling with approved vibratory rollers of adequate weight and size. Materials shall be spread and compacted parallel to the dike axis.

5. The placement moisture content for Zone 1 shall be between 2 percent below and 2 percent above optimum moisture content (ASTM D-698), as shown in figure 1 of this section.

6. Compact Zones 1 to not less than 98 percent of the laboratory maximum dry density (ASTM D-698); as shown in figure 1 of this section, as determined by the level of effort and density specifications determined by the Owner from the test fill described in Section 3.4.

7. Control and conduct all operations including but not limited to transporting, stockpiling, excavating, producing, and placing the materials to minimize contamination, segregation, and particle breakdown.

8. The material as placed and compacted in the embankment shall be free from segregation and free of all contaminated materials.

C. Liner Layer (Zone 2) and Clay Portion of Zone 3

1. The moisture content of the Zone 2 and Clay portion of Zone 3 material shall be distributed uniformly throughout each layer of material prior to and during compaction.

2. Material shall be thoroughly wetted on the fill by watering prior to compaction.

3. Spread materials in layers not exceeding 8 inches in loose thickness and compact by rolling with approved rollers as determined in the test fill.

4. The placement moisture content for Zone 2 and Clay portion of Zone 3 materials shall be a minimum of the optimum moisture ±2%, as defined by ASTM D 1557 (i.e. 15.7%) and a maximum moisture of the optimum moisture ±1%, as defined by ASTM d 698 (20.2%). Refer to figure 1 of this section.

5. Materials too wet for compaction shall be dried to the proper moisture content before compaction.

6. Compact Zones 2 to not less than 98 percent of the laboratory maximum dry density (ASTM D-698), as shown on Figure 1 of this section and as determined by the level of effort and density specifications determined by the Owner from the test fill described in Section 3.5.

7. Control and conduct all operations including but not limited to transporting, stockpiling, excavating, producing, and placing the materials to minimize contamination, segregation, and particle breakdown.

8. The material as placed and compacted in the embankment shall be free from segregation and free of all contaminated materials.

D. Drain Material (Zone 4)

1. Control and conduct all operations including but not limited to transporting, stockpiling, excavating, producing, and placing the materials to minimize contamination, segregation, and particle breakdown.

2. Place the material in continuous, horizontal lifts not more than 12 inches in loose thickness. The material as placed and compacted in the embankment shall be free from segregation and free of all contaminated materials.

3. Prevent soils from adjacent zones from being tracked onto the drain. Remove and replace all contaminated drain material.

4. The intention of the drain material is to provide drainage through the dike and a stable foundation of the remaining zones of the dike. The moisture content of the placed drain and compactive effort applied to the drain shall meet these requirements, as approved by the Owner.

3.7 FIELD QUALITY CONTROL

A. Tests

1. Give advance notice of at least 24 hours to Engineer when ready for compaction or subgrade testing and inspection.

2. Notify the Owner 24 hours prior to commencement of proof-rolling of the foundation.

3. The Owner will take samples from the various zones of the embankmert and will perform tests to evaluate whether the materials meet requirements of the specifications, including gradations, in-place density, and moisture content.

4. The contractor shall assist the Owner in obtaining representative samples for testing.

5. Other tests will be performed as deemed necessary by the Engineer.

6. Tests will not be the sole basis for determination of whether the fill meets the specification requirements.

7. The final acceptance or rejection of the fill will be based on the Engineer's opinion considering test results and the general disposition of the fill.

8. If the fill is rejected, remove and replace rejected material at no cost to Owner.

3.8 CLEANING

A. After completion of construction, remove from all permarent construction sites, Pond 10 area, borrow areas, and temporary construction operation areas, all excess materials, debris, and other foreign materials and dispose in accordance with the specification requirements.

B. Cleanup of temporary construction roads, resulting from the Contractor's operations, regardless of location, shall include regrading to the original contours, smoothing and grading of the ground surface to eliminate ruts for erosion prevention and the trimming and smoothing of eroded or caved slopes of cuts or embankments to a stable condition.

C. All embankment slopes, borrow pits and waste areas shall be left in a smooth and stable condition and shall be graded to drain, and shall be seeded as requested by the Owner.

3.9 PROTECTION/MAINTENANCE

A. Maintain the embankment in a manner satisfactory to the Engineer until the final completion and acceptance of all Work under this Contract.

END OF SECTION 02290

Standard Proctor Curve
DP&L Bottom Ash

JOB NO. 5272-017 DATE: 02/26/97
PROJECT WOODWARD CLYDE CONSULTANTS
LOCATION:

SOURCE OF MATERIAL S-6849 DEPTH 0.0 FT.
DESCRIPTION OF MATERIAL DP&L BOTTOM ASH -
ASTM DESCRIPTION

METHOD ASTM D-698-91 MTHD A MAX. DRY DENSITY 61.8 PCF OPTIMUM MOISTURE 42.7 %

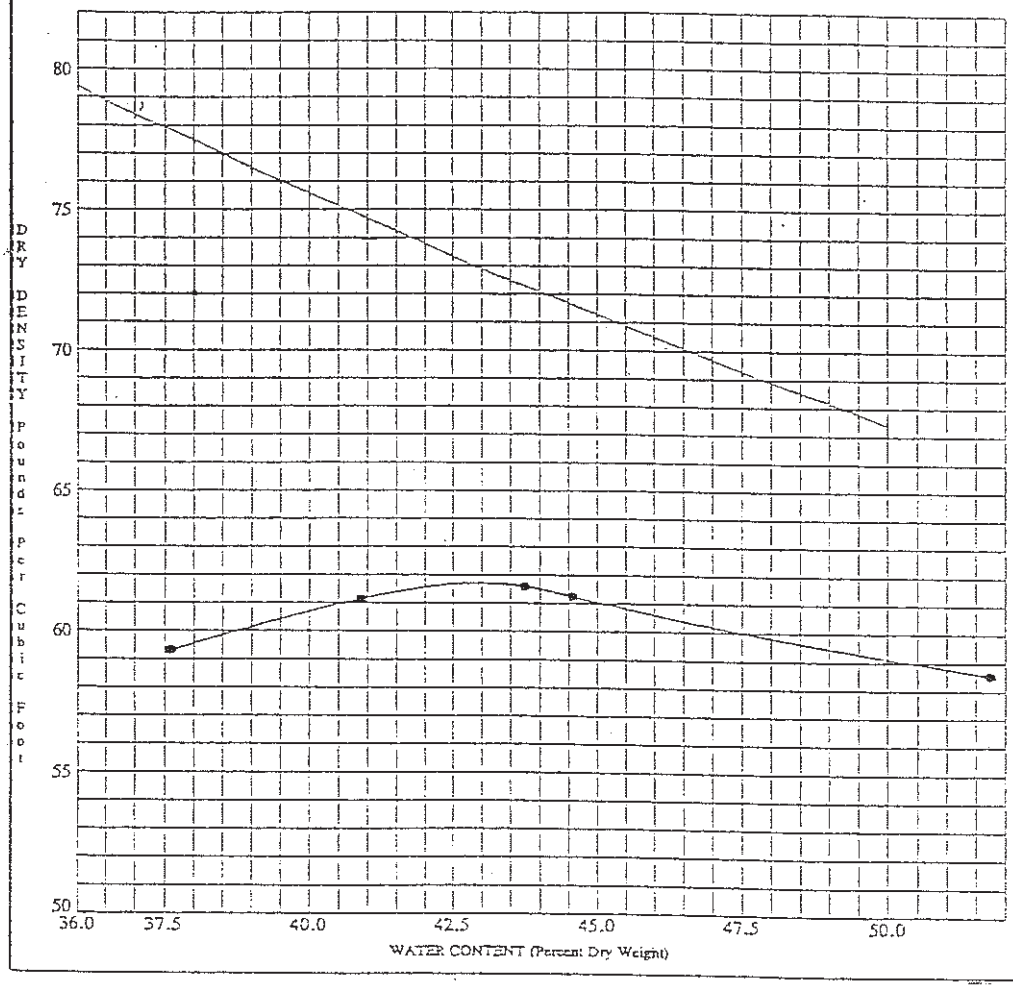
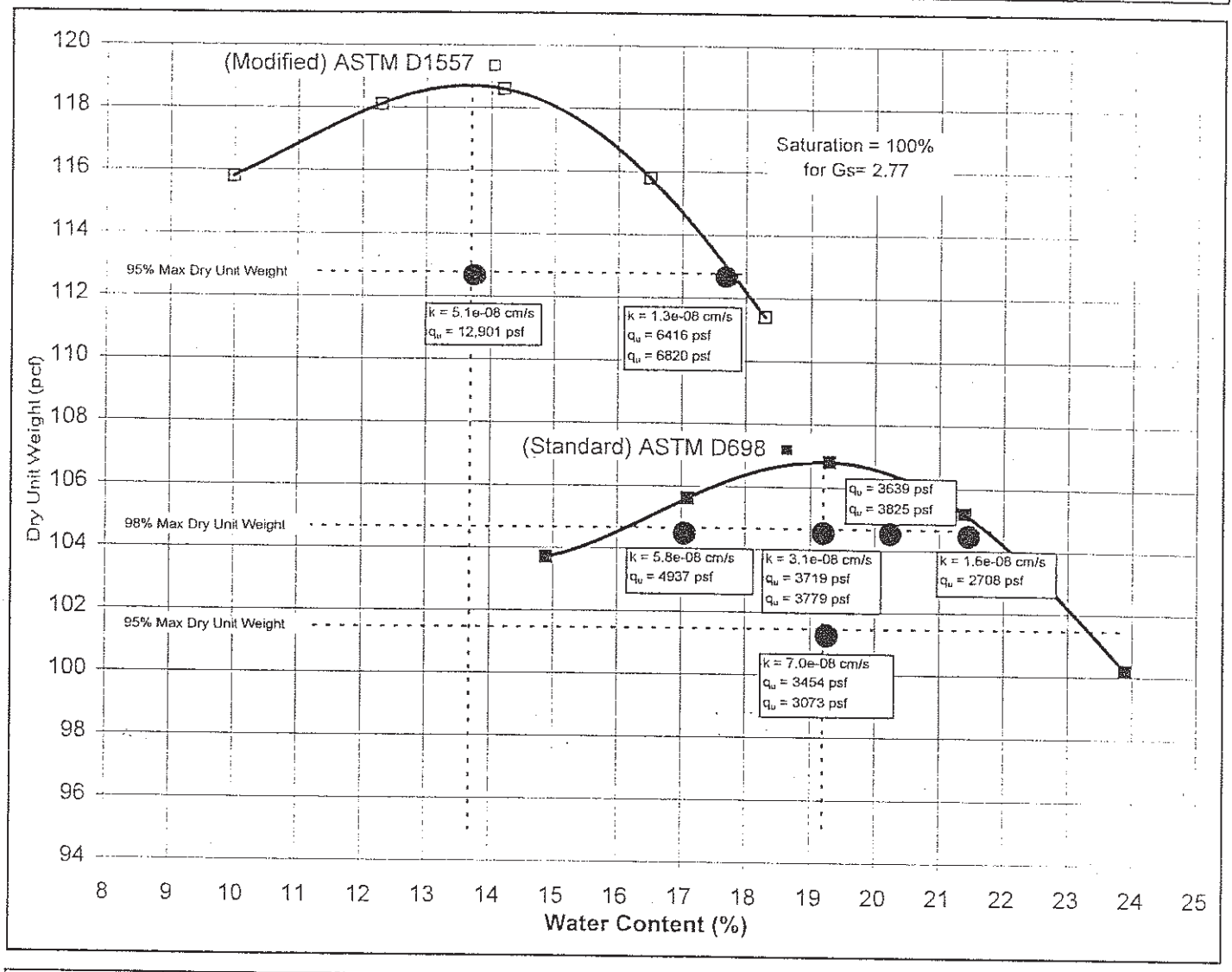


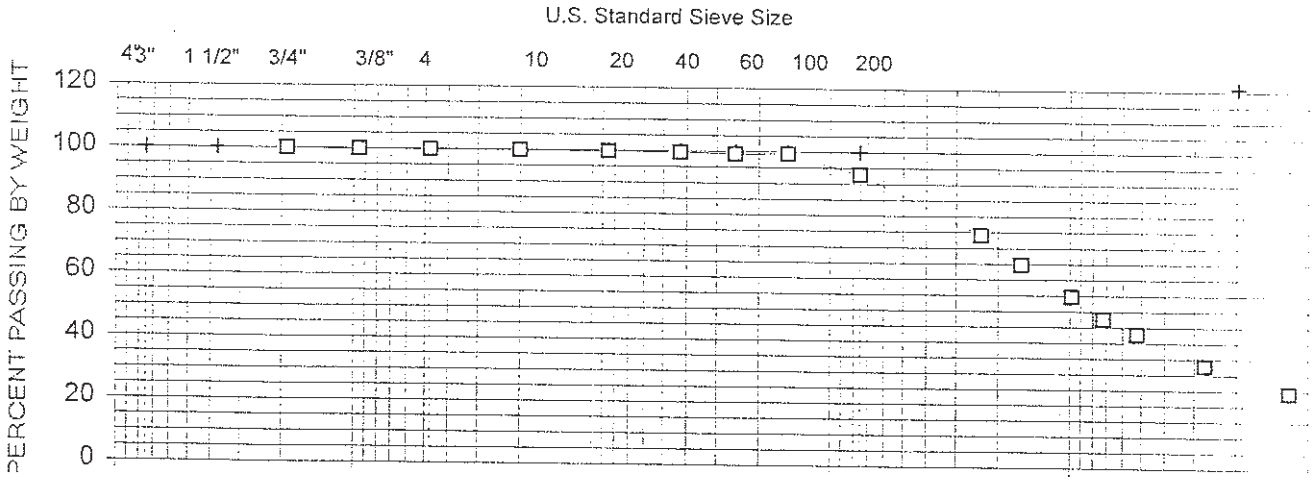
Figure 1

SUMMARY OF BORROW INVESTIGATION
FIGURE 2

Project: Dayton Power and Light Co.					
Sample Location:	Borrow Area: Composite Sample B1011-1 - B1011-7			Depth(ft):	0-14 variable
Material:	Brown Lean Clay. CL				
Method of Compaction:	ASTM D698-91-A (Standard);ASTM D1557-A (Modified); Dry Prep. Method, (manual rammer)				
Opt. Water Content (%) Std. / Mod.	19.2	13.7	Specific Gravity: 2.77 (boil method)	Liquid Limit	40
Max Dry Unit Wt (pcf) Std. / Mod.	106.8	118.7	Ave. As-received Water Content, %: 22.7	Plastic Limit	21



COBBLES	%GRAVEL = 0.0		%SAND = 7.1			%SILT = 64.0	%CLAY = 28.8
	COARSE	FINE	COARSE	MEDIUM	FINE		



File: B1011sum.xls Project No.: 3808E06133 Plotted by: TAG Reviewed by: PJK / TAG Date: 7/1/99 Figure 2

SECTION 02220

EXCAVATION AND BACKFILL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating, backfilling and disposing of earth materials for the purpose of constructing outlet structure, outlet pipe, pond 8w sand drain, dike access road and top of proposed dike access road. Preparation of subgrade for footings, foundations, and slabs and temporary means needed to prevent discharge of sediment to water courses. For additional specification for proposed dike and pond 10 excavation & backfill see section 02290.

1.2 QUALITY ASSURANCE

A. Source Quality Control: CONTRACTOR shall be responsible for the payment of all testing required to determine the acceptability of proposed fill and backfill material.

B. Permits and Regulations:

1. All required building and construction permits.

2. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.

1. ASTM A 36, Structural Steel.

2. ASTM A 328, Steel Sheet Piling.

3. ASTM D 422, Particle-Size Analysis of Soils.

4. ASTM D 4318, Liquid Limit, Plastic Limit and Plasticity Index of Soils.

5. ASTM D 2922, Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

6. ASTM D 2487, Classification of Soils for Engineering Purposes.

7. AISC Specifications for the Design, Fabrication, and Erection of Structural Steelfor Buildings.

1.3 SUBMITTALS

A. Submit for review and comment the following items:

1. Sheeting and bracing.

2. Protection methods anticipated.

3. Underpinning.

B. The Drawings shall be prepared by a professional engineer registered in the State of Ohio and recognized as expert in the specialty involved. The Drawings shall be submitted to the OWNER for purposes of establishing that the terms of the Specifications are complied with only. Submit calculations and all other pertinent information. Drawing submissions will not be checked and will not imply approval by the OWNER of the work involved.

C. CONTRACTOR shall be wholly responsible for designing, installing and operating whatever system is necessary to accomplish satisfactory sheeting, bracing, protection, underpinning and dewatering.

1.4 JOB CONDITIONS

A. Existing Structures and Utilities:

1. Shown on the Drawings are certain surface and underground strudures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. Explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or otherwise damaged, they shall be restored immediately by the CONTRACTOR at his expense.

2. Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

   a. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the OWNER and OWNER immediately for directions as to procedures to be taken. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

3. Do not interrupt existing utilities serving facilities occupied and used by others, except when permitted in writing by OWNER and then only after acceptable temporary utility services have been provided.

B. Use of Explosives: Not permitted on the job site.

C. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this Work and post with warning lights.

2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

3. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

D. Dust Control: Conduct all operations and maintain the area of activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Select Fill and Backfill Materials:

1. Place below footings, foundations, slabs and against structure walls.

2. Fill shall be well-graded, granular material or bank run gravel, free from organic matter. All fill shall be certified clean and not subject to previous industrial activity. Not more than 50 percent by weight shall pass through a No. 40 sieve; not more than 10 percent by weight shall pass through a No. 200 sieve; and 100 percent shall pass a 6-inch square sieve.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions under which excavating are to be performed and notify the OWNER of conditions he may find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 TEST PITS

A. Where ordered by the OWNER, excavate and backfill, in advance of construction, test pits to determine conditions or location of existing facilities.

B. Test pits may be made by the CONTRACTOR for his own use at no additional cost to the OWNER.

3.3 EXCAVATION

A. General:

1. Perform all excavation required to complete the Work as shown and specified.

2. Excavated Materials: Earth, sand, clay, gravel, hardpan, boulders not requiring drilling or jackhammering to remove, decomposed rock, sediment, rubbish and all other materials within the excavation limits, except rock.

B. Structures and Pipelines:

1. Excavations: Open excavations, shored and braced where necessary to prevent possible injury to workmen and to new and existing structures or pipelines per OSHA Standard 29 CFR, Subpart P, Section 1926.650 to 1926.653 and other applicable standards.

2. Sheeting and Bracing: Install in accordance with drawings submitted under Article 1.3 above.

C. Size of Excavations: Extend excavation sufficiently on each side of pipes, structures, footings, etc., to permit setting of forms, installation of sheeting or the safe sloping of banks.

D. Subgrades:

1. General Requirements: The compaction of backfill shall be maintained at ±2 percent from optimum moisture content. The compacted fill shall remain firm and intact under all construction operations. Mud, muck and other soft or unsuitable materials shall be removed.

2. Subgrade Requirements for Trench Bottoms, Structural Fills and Access Roads Compact to at least 98% of the maximum Standard Proctor Method dry unit weight.

3. Subgrade Requirements for Footing Foundations: Compact to at least 98 percent of the maximum Standard Proctor dry unit weight.

4. Soft Subgrades: For subgrades which are otherwise solid, but which become soft or mucky on top due to construction operations, follow these procedures:

   a. Remove the soft and mucky material and replace with suitable backfill compacted to the specified density. The soft surface can also be stabilized with crushed stone, crushed slag or lime.

   b. Overlay with geotextile fabric prior to placement of crushed stone or gravel.

5. Finished Elevation of Stabilized Subgrades: Do not place above subgrade elevations shown.

E. Stability of Excavations:

1. Sides of Excavations: Slope to comply with OSHA Standard 29 CFR, Subpart P, Section 1926.650 to 1926.653 and other applicable standards and applicable codes and ordinances of agencies having jurisdiction.

2. Shoring and Bracing: Provide shoring an bracing where sloping is not possible either because of space restrictions or stability of material excavated.

3. Safety: Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

4. Caving: If caving occurs outside the excavation area, backfill the resulting hole in accordance with the requirements of this section after removing the loose material.

F. Material Storage:

1. Stockpile excavated materials in an approved area by the OWNER, until required for backfill or fill. Do not place clean soil in the protection area.

2. Place, grade and shape stockpiles for proper drainage.

3. Locate and retain soil materials away from edge of excavations.

4. Excess soil and waste materials shall be stored on-site and tested to determine heavy metal concentrations.

G. Unsuitable Material:

1. Where the existing material beneath the bedding material is considered unsuitable by the OWNER, remove and replace it with select backfill.

2. The selected backfill shall be compacted in accordance with the specified density criteria in subsection 3.6.

3.4 DRAINAGE AND DEWATERING

A. General:

1. Prevent surface and subsurface water from ponding in the excavations and from flooding adjacent areas.
2. Remove water from excavation as fast as it collects.

3. Maintain the ground water level at least 3 feet below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.

4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.

5. Obtain OWNER's approval before shutting down dewatering system for any reason.

B. Standby Requirements for Dewatering: Provide standby equipment to ensure continuity of dewatering operations.

C. Disposal of Water Removed by Dewatering System:

1. Dispose of all water removed from the excavation to the Ash Pond 3A outlet structure.

2. Dispose of water in such a manner as to cause no inconvenience to the OWNER, OWNER, or others involved in work about the site.

3. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.

3.5 SHEETING, SHORING AND BRACING

A. General:

1. Sheet, shore and brace all open excavations where necessary to prevent injury to workmen, structures, or pipe lines.

2. Observe all municipal, county, state and federal ordinances, codes, regulations and laws.

3. Used material shall be in good condition, not damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary work.

4. Timber Used for Breast Boards (lagging): New or used, meeting the requirements for Douglas Fir Dense Construction grade or Southern Pine No. 2 Dense S3.

5. Design in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC, for all steel work for sheeting, shoring, bracing, cofferdams, etc. except that field welding will be permitted.

6. Steel Sheet Piling: Manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36. Furnish mill test reports on new piling but not used ones.

7. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

8. Unless otherwise shown, specified, or ordered, remove all materials used for temporary construction when work is completed. Make this removal in a manner not injurious to the structure or its appearance or to adjacent Work.

9. Safe and satisfactory sheeting shall be the sole responsibility of the CONTRACTOR.

B. Removal of Sheeting and Bracing:

1. Remove sheeting and bracing from excavation unless otherwise directed in writing by the OWNER.

2. Conduct removal so as to not cause injury to the Work.

3. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structure.

3.6 GENERAL BACKFILL

A. Furnish, place and compact all general backfill and fill required to provide the finished grades shown and described herein.

B. Restrictions: Backfill excavations as promptly as Work permits, but not until completion of the following:

1. Reviewed by OWNER of construction below finish grade.

2. Inspection, testing, approval, and recording of locations of underground utilities.

3. Removal of concrete formwork.

4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.

5. Removal of trash and debris.

6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

C. Placement:

1. Keep excavation dry during backfilling operations.

2. Bring up backfill evenly on all sides around structures and pipes.

3. Compact fill to the degree and within the moisture content specified in Paragraph 3.6.H of this Section.

D. Thickness of Lifts: Unless otherwise specified or required, place fill in horizontal lifts not exceeding 8 inches in compacted thickness and mix and spread in a manner assuring uniform lift thickness after placing.

E. Moisture:

1. Control the water content of fill material during placement within the range necessary to obtain the compaction specified.

2. In general, maintain the moisture content of the fill within ±2 percent of the optimum moisture content for compaction as determined by laboratory tests.

3. Perform all necessary work to adjust the water content of the material to within the range necessary to permit the compaction specified.

4. Do not place fill material when free water is standing on the surface of the area where the fill is to be placed.

5. No compaction of fill will be permitted with free water on any portion of the fill to be compacted.

F. Unacceptable Material:

1. Do not place or compact fill in a frozen condition or on top of frozen material.

2. Remove fill containing organic materials or other unacceptable material and replace with approved fill material.

G. Equipment:

1. Compact fill with equipment suitable for the type of material placed and which is capable of providing the densities required.

2. Contractor shall submit for approval compaction equipment and the proposed procedure to the OWNER.

H. Compaction Criteria:

1. General backfill shall be compacted to at least 98 percent of the maximum Standard Proctor dry unit weight as achieved by ASTM D 698.

2. The backfill shall be compacted with a moisture content within ±2 percent of the optimum moisture content.

I. Tests:

1. Test the effectiveness of the equipment at the commencement of compacted fill Work by construction of a small section of fill within the area where fill is to be placed.

2. If tests on this section of fill show that the specified compaction is not obtained, increase the amount of coverages, decrease the lift thickness or obtain a different type of compactor.

3. There shall be no additional payment for test fills.

J. Backfill Around Structures:

1. Follow the specified procedures for backfill around structures except that within 2 feet of foundations and underground structures, use light compaction equipment with the gross weight of the equipment not exceeding 7,000 pounds.

2. Provide equipment that is capable of the required compaction within restricted areas next to structures and around pipes.

K. Inadequate Compaction:

1. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, perform whatever work is required to provide the required densities.

2. This work includes complete removal of unacceptable fill areas and replacement and recompaction until acceptable fill is provided.

L. Settlement:

1. Repair any settlement that occurs, at CONTRACTOR's expense.

2. Make all repairs and replacements necessary within 30 days after notice from the OWNER.

3.7 GRADING

A. General:

1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.

2. Smooth subgrade surfaces within specified tolerances.

3. Compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

3.8 DISPOSAL OF EXCAVATED MATERIALS

A. Following testing, all excess material removed from the excavations will be disposed of on-site at a location to be specified by the OWNER in accordance with EPA, state and local regulations.

END OF SECTION 02220

APPENDIX 5
Design Drawings
By URS Greiner Woodward Clyde, Dated 30 June 1999

PROPOSED ASH POND 10
J.M. STUART ELECTRIC GENERATING STATION

PREPARED FOR
DAYTON POWER & LIGHT
ABERDEEN, OHIO

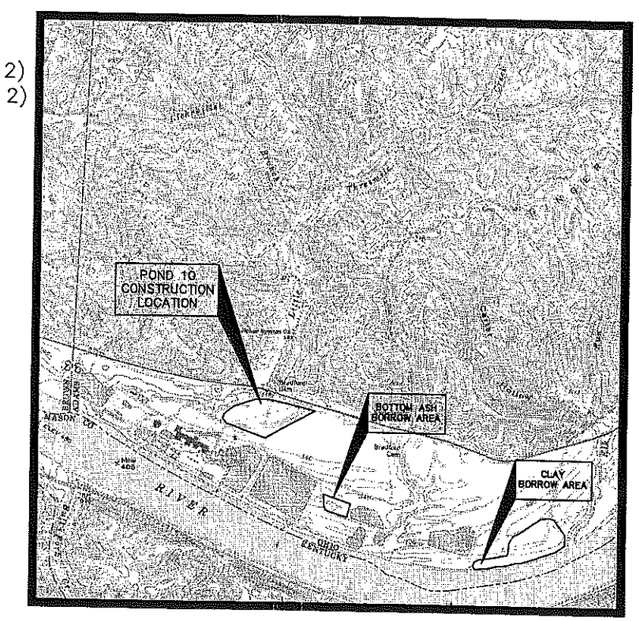
99 JUN -6 AM 1:52

DRAWING INDEX

SHEET NO.	TITLE
C1	TITLE SHEET
C2	EXISTING CONDITIONS & DEMOLITION PLAN
C3	SITE PLAN
C4	DIKE GRADING PLAN
C5	DIKE ALIGNMENT PLAN AND PROFILE (SHEET 1 OF 2)
C6	DIKE ALIGNMENT PLAN AND PROFILE (SHEET 2 OF 2)
C7	OUTLET PIPE PLAN AND PROFILE (SHEET 1 OF 3)
C8	OUTLET PIPE PLAN AND PROFILE (SHEET 2 OF 3)
C9	OUTLET PIPE PLAN AND PROFILE (SHEET 3 OF 3)
C10	DIKE DETAILS
C11	POND 8W DIKE SAND TOE DRAIN PLAN & PROFILE
C12	EROSION CONTROL AND BORING LOCATIONS
C13	SOIL BORING LOGS
C14	OUTLET PIPE DETAILS
S1	STRUCTURAL DETAILS (SHEET 1 OF 4)
S2	STRUCTURAL DETAILS (SHEET 2 OF 4)
S3	STRUCTURAL DETAILS (SHEET 3 OF 4)
S4	STRUCTURAL DETAILS (SHEET 4 OF 4)
N1	NOTES

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

1961 PHOTOREVISED 1965
EXCERPT FROM
MAYSVILLE EAST, OHIO–KENTUCKY



LOCATION MAP

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1 0.5 0 1 KILOMETER
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

APPLICANT

THE DAYTON POWER AND LIGHT COMPANY
U.S. ROUTE 52, P.O. BOX 468
ABERDEEN, OHIO 45101
CONTACT: CRAIG SPANGLER (937) 549–2641

OPERATOR

THE DAYTON POWER AND LIGHT COMPANY
U.S. ROUTE 52, P.O. BOX 468
ABERDEEN, OHIO 45101

LANDOWNERS

THE DAYTON POWER AND LIGHT COMPANY
CINCINNATI GAS AND ELECTRIC
COLUMBUS SOUTHERN POWER

PREPARED BY

URS GREINER WOODWARD CLYDE
30775 BAINBRIDGE ROAD, SUITE 200
SOLON, OHIO 44139–2219
CONTACT: STEVEN F. PUTRICH, P.E.
(440) 349–2708

POND IMPOUNDMENT STRUCTURE
IS A DIKE DESIGNATED AS CLASS II

INDUSTRIAL WASTE DISPOSAL
APPROVED
OHIO ENVIRONMENTAL PROTECTION AGENCY
AS EVIDENCED BY COPY OF
LETTER OF APPROVAL
HEREUNTO ATTACHED

STATE OF OHIO
KEITH C. MAST
E-44300
REGISTERED
PROFESSIONAL ENGINEER

ISSUED FOR BIDDING	DATE	BY
ADDENDUM REVISIONS		
ADDENDUM NO.	ADDENDUM DATE	BY
ISSUED FOR CONSTRUCTION	DATE	BY
REVISIONS		
NO.	DESCRIPTION	DATE / BY

RECORD DRAWINGS DATE BY

DP&L
The Dayton Power and Light Company

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DRAWN	PCC	DATE	6/30/99
CHECKED	SFP	JOB NO	3B08E06133
SCALE	AS SHOWN		

TITLE SHEET

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C1

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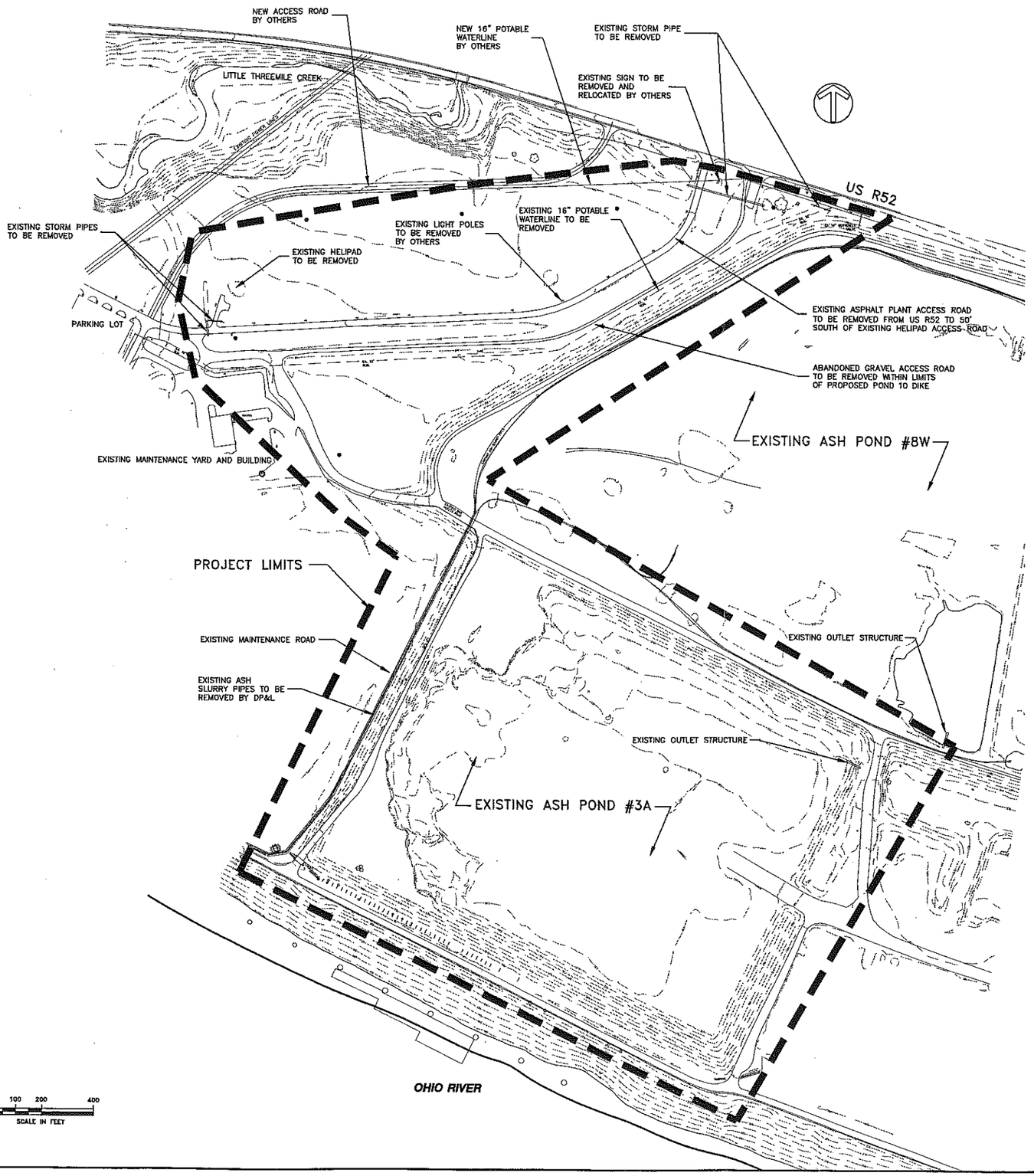

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INDUSTRIAL WASTE APPROVED OHIO ENVIRONMENTAL PROTECTION AGENCY AS EVIDENCED BY LETTER OF APPROVAL DATED _____ HERETO ATTACHED. COPY OF

NOTES:

1. THE CONSTRUCTION DOCUMENTS INCLUDE THESE DEVELOPMENT PLANS AND THE ACCOMPANYING PROJECT BOOKLET SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE TO MEET THE PROJECT REQUIREMENTS AS IDENTIFIED IN THE CONSTRUCTION DOCUMENTS AND TO REPORT ANY CONFLICTING REQUIREMENTS BETWEEN THE PLANS AND BOOKLET SPECIFICATIONS DIRECTLY TO THE OWNER OR HIS REPRESENTATIVE. FINAL INTERPRETATION OF THE PROJECT REQUIREMENTS LIE WITH THE OWNER.

2. EXISTING SITE INFORMATION SHOWN ON THESE DRAWING IS TAKEN FROM A SURVEY BY HENDERSON AERIAL SURVEYS INC. DATED 9-11-98 AND SELECTED AERIAL TOPOGRAPHY SURVEYS AND DESIGN PLANS BY DAYTON POWER & LIGHT, DATED 1976-1994. THIS INFORMATION HAS BEEN PRESUMED TO BE AN ACCURATE REPRESENTATION OF THE CONDITIONS AT THE SITE. WORK PERFORMED AT THE SITE OR IN THE ADJACENT WORK AREA SINCE THE DATE OF THE SURVEY MAY NOT BE SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AT THE SITE AND REPORT SIGNIFICANT DIFFERENCES TO THE OWNER AND THE OWNER'S REPRESENTATIVE IMMEDIATELY.

3. THE CONTRACTOR SHALL CAUSE NOTICE TO BE GIVEN TO THE OHIO UTILITY PROTECTION SERVICE (800-362-2764) AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS FOR WORK.

5. THE CONTRACTOR SHALL CONFINE HIS ACTIVITIES TO WITHIN THE WORK AREA. THE CONTRACTOR SHALL NOT TRESPASS UPON ADJACENT PROPERTIES OR RIGHTS OF WAY WITHOUT THE WRITTEN CONSENT OF THE PROPERTY OWNER.

6. ALL REMOVED ITEMS SUCH AS, BUT NOT LIMITED TO POSTS, LIGHTING, SIGNS, AND FENCING SHALL REMAIN THE PROPERTY OF DP&L. ITEMS SHALL BE STOCKPILED IN A SECURED AREA AS DIRECTED BY THE OWNER.

7. THE CONTRACTOR SHALL STOCKPILE ALL SURPLUS EXCAVATED MATERIAL OR CONSTRUCTION DEBRIS TO ON SITE LOCATIONS AS DIRECTED BY THE OWNER.

8. THE IDENTITY AND LOCATION OF ALL EXISTING UNDERGROUND UTILITIES KNOWN TO BE LOCATED IN THE CONSTRUCTION AREA HAVE BEEN SHOWN ON THE DRAWINGS AS ACCURATELY AS POSSIBLE, BASED ON AVAILABLE INFORMATION. THE OWNER AND HIS REPRESENTATIVE ASSUME NO RESPONSIBILITY FOR THE ACCURACY AND DEPTH OF THE UNDERGROUND FACILITIES SHOWN.

9. THE CONTRACTOR SHALL INVESTIGATE AND LOCATE ALL EXISTING UTILITIES AHEAD OF THE CONSTRUCTION.

10. THE SUPPORT, PROTECTION, AND RESTORATION OF ALL EXISTING UNDERGROUND UTILITIES AND THEIR APPURTENANCES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE METHOD OF SUPPORT OR PROTECTION MUST BE APPROVED BY THE UTILITY OWNER.

11. THE LOCATION OF ALL UTILITY SERVICE CONNECTIONS SHALL BE RECORDED ON THE CONSTRUCTION PLANS MAINTAINED AT THE SITE BY THE CONTRACTOR.

BAR IS ONE-INCH ON ORIGINAL DRAWING
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IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

ISSUED FOR BIDDING	DATE	BY
ADDENDUM REVISIONS		
ADDENDUM NO	ADDENDUM DATE	BY
ISSUED FOR CONSTRUCTION	DATE	BY
REVISIONS		
NO.	DESCRIPTION	DATE / BY

RECORD DRAWINGS DATE BY

DP&L
The Dayton Power and Light Company

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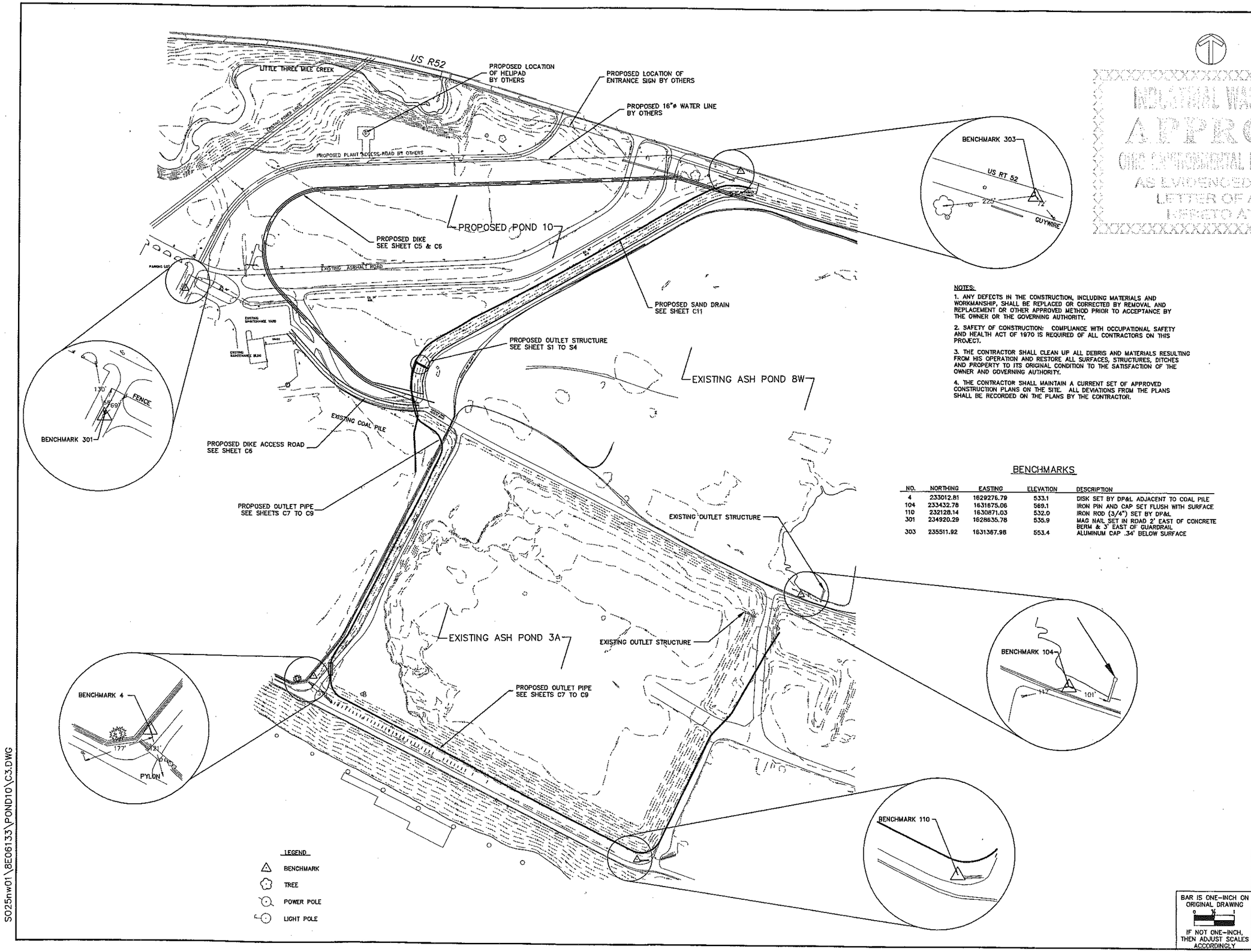
DRAWN	PCC	DATE	6/30/99
CHECKED	SFP	JOB NO	3808E06133
SCALE	AS SHOWN		

EXISTING CONDITIONS & DEMOLITION PLAN

PROPOSED POND 10
DP&L - JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C2



NOTES:

1. ANY DEFECTS IN THE CONSTRUCTION, INCLUDING MATERIALS AND WORKMANSHIP, SHALL BE REPLACED OR CORRECTED BY REMOVAL AND REPLACEMENT OR OTHER APPROVED METHOD PRIOR TO ACCEPTANCE BY THE OWNER OR THE GOVERNING AUTHORITY.

2. SAFETY OF CONSTRUCTION: COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 IS REQUIRED OF ALL CONTRACTORS ON THIS PROJECT.

3. THE CONTRACTOR SHALL CLEAN UP ALL DEBRIS AND MATERIALS RESULTING FROM HIS OPERATION AND RESTORE ALL SURFACES, STRUCTURES, DITCHES AND PROPERTY TO ITS ORIGINAL CONDITION TO THE SATISFACTION OF THE OWNER AND GOVERNING AUTHORITY.

4. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF APPROVED CONSTRUCTION PLANS ON THE SITE. ALL DEVIATIONS FROM THE PLANS SHALL BE RECORDED ON THE PLANS BY THE CONTRACTOR.

BENCHMARKS

NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
4	233012.81	1629276.79	533.1	DISK SET BY DP&L ADJACENT TO COAL PILE
104	233432.78	1631675.06	569.1	IRON PIN AND CAP SET FLUSH WITH SURFACE
110	232128.14	1630871.03	532.0	IRON ROD (3/4") SET BY DP&L
301	234920.29	1628635.78	535.9	MAG NAIL SET IN ROAD 2' EAST OF CONCRETE BERM & 3' EAST OF GUARDRAIL
303	235511.92	1631367.98	553.4	ALUMINUM CAP .34' BELOW SURFACE

INDUSTRIAL WASTE DISPOSAL
APPROVED
OHIO ENVIRONMENTAL PROTECTION AGENCY
AS EVIDENCED BY LETTER OF APPROVAL
HERETO ATTACHED

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SCALE	AS SHOWN		

SITE PLAN

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C3

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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LITTLE THREE MILE CREEK

EXISTING POWER LINES

PROPOSED ACCESS ROAD BY OTHERS

PROPOSED 16"ø WATER LINE BY OTHERS

US ROUTE 52

PROPOSED OUTBOARD TOE OF DIKE

TOP OF DIKE

PROPOSED INBOARD TOE OF DIKE

PROPOSED POND 10

EXISTING ENTRANCE ROAD

EX. 16" W.M.

EXISTING MAINTENANCE YARD

EXISTING MAINTENANCE BUILDING

GRASS

EXISTING 18" SLURRY PIPES

EXISTING COAL PILE

EXISTING POND 8W

LEGEND

PROPOSED CONTOURS

EXISTING CONTOURS

0 50 100 200

SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING

0 ½ 1

IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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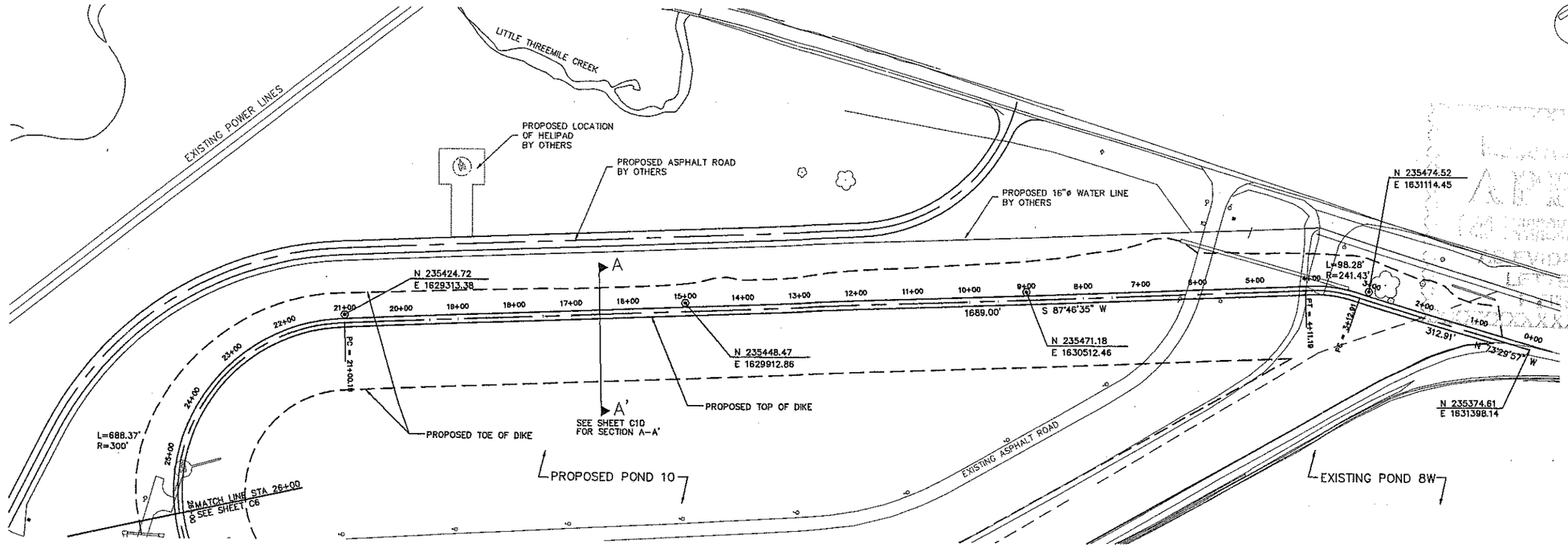
DIKE GRADING PLAN

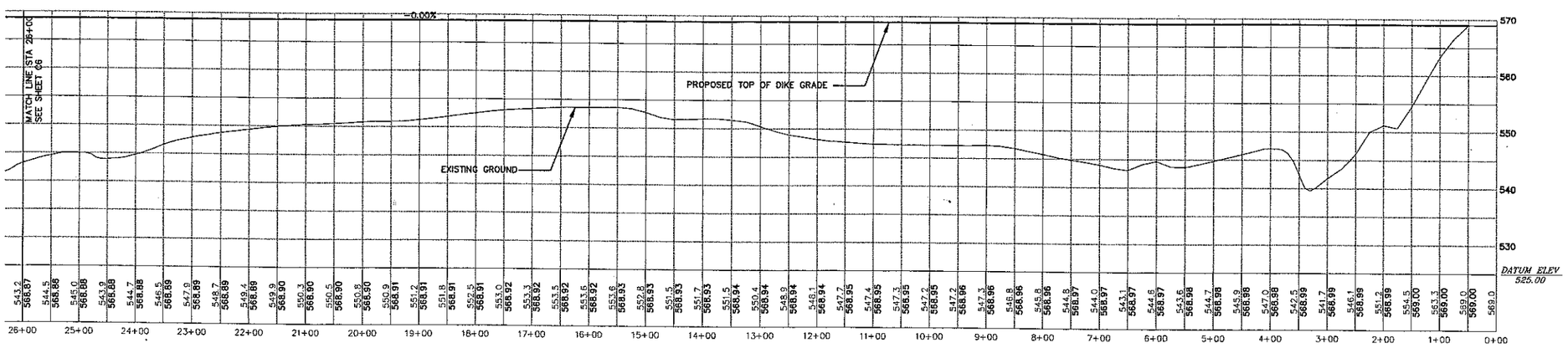
PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C4



DIKE ALIGNMENT



DIKE PROFILE

VERTICAL
0 5 10 20
SCALE IN FEET

HORIZONTAL
0 50 100 200
SCALE IN FEET

LEGEND

⊙ PROPOSED SURVEY INSTRUMENTATION MONUMENT TWO FT OUTSIDE DIKE SHOULDER SEE SHEET C6 FOR DETAIL

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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DIKE ALIGNMENT PLAN AND PROFILE (SHEET 1 OF 2)

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C5

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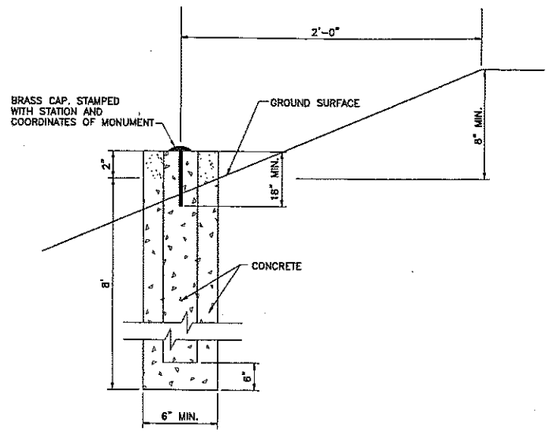
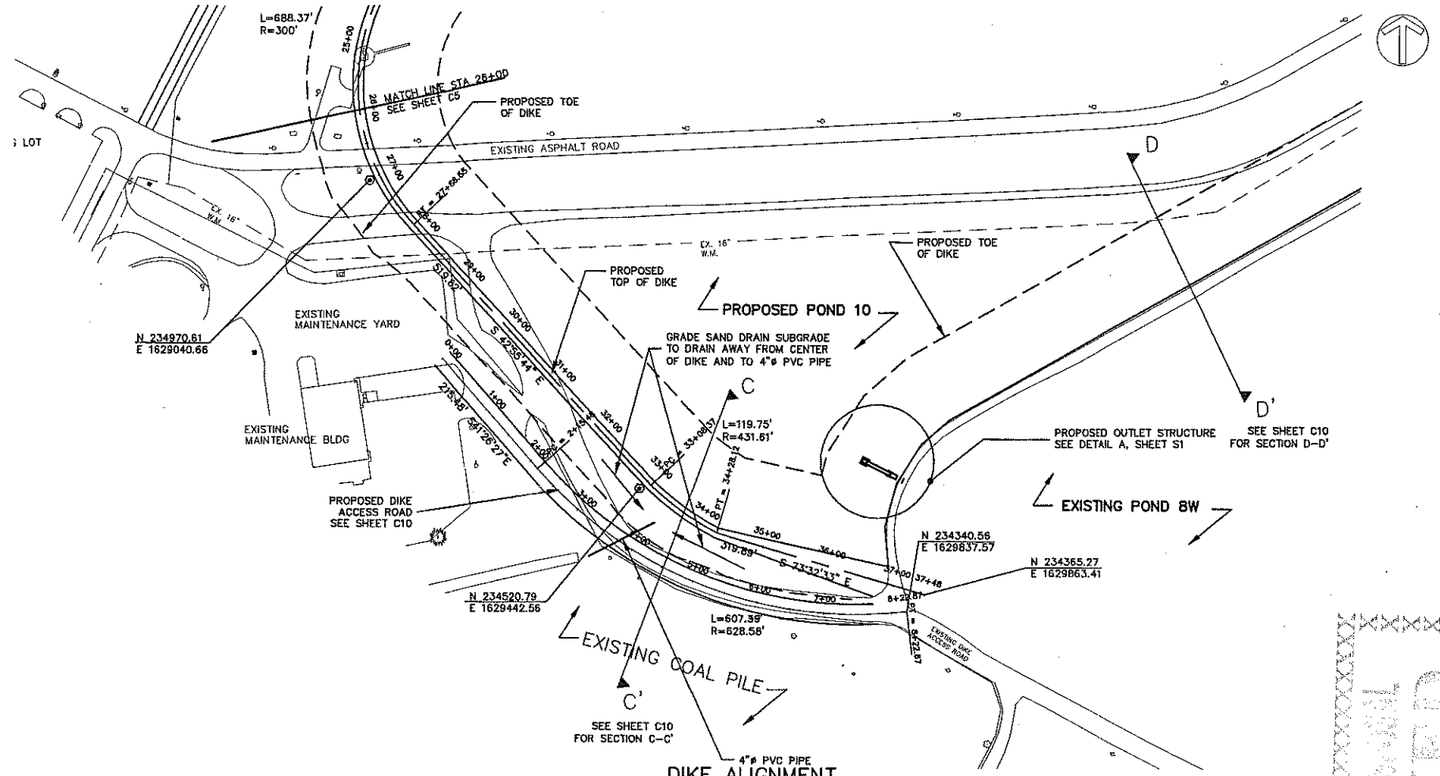
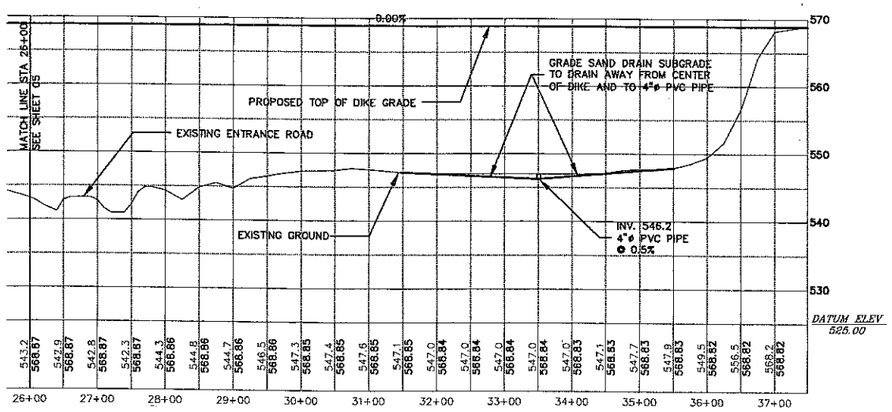


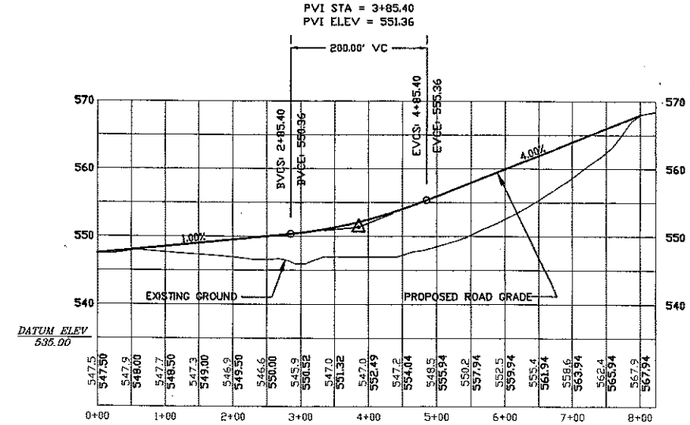
SURVEY INSTRUMENTATION MONUMENT DETAIL
NOT TO SCALE



DIKE ALIGNMENT



DIKE PROFILE



DIKE ACCESS ROAD PROFILE

VERTICAL
0 5 10 20
SCALE IN FEET

HORIZONTAL
0 50 100 200
SCALE IN FEET

LEGEND

⊙ PROPOSED SURVEY INSTRUMENTATION MONUMENT TWO FT OUTSIDE DIKE SHOULDER SEE DETAIL THIS SHEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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DIKE ALIGNMENT PLAN AND PROFILE (SHEET 2 OF 2)

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C6

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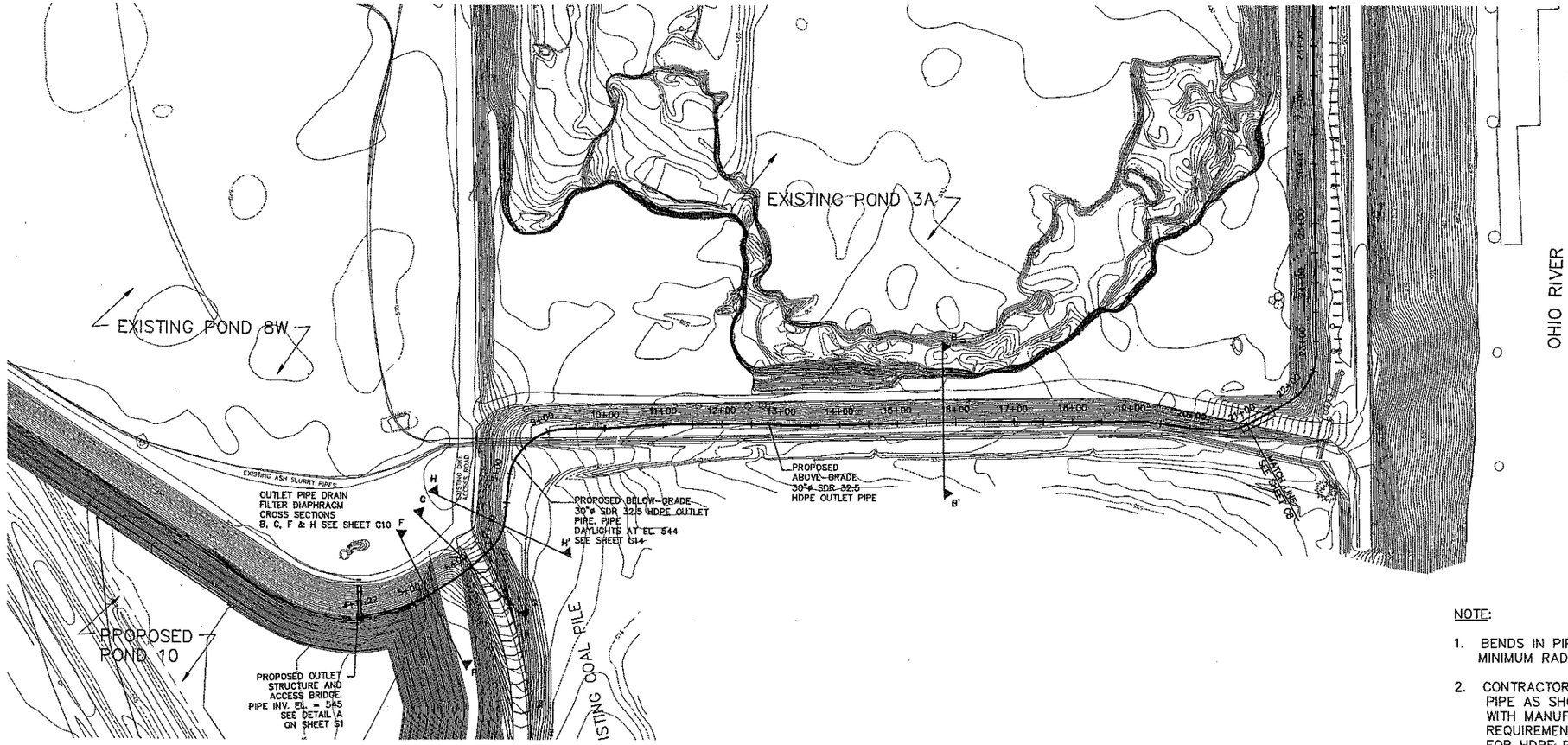
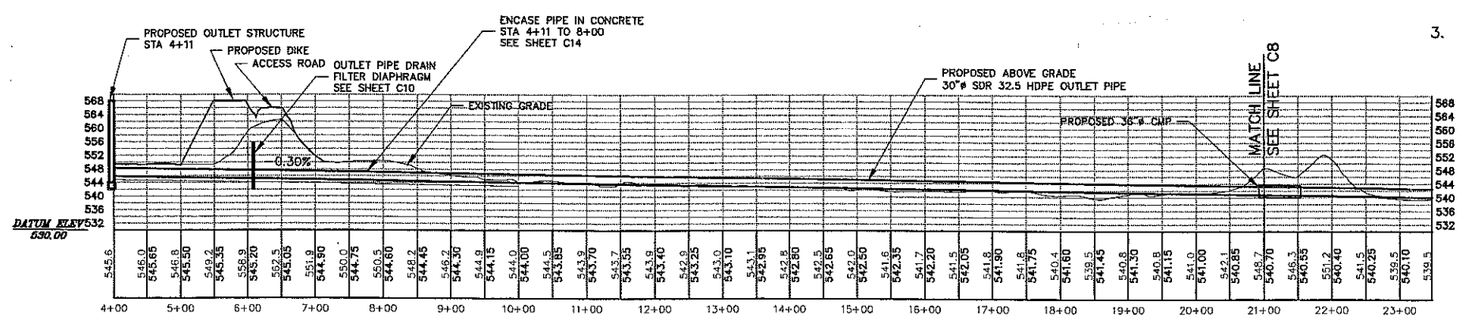


PLAN



PROFILE

NOTE:

1. BENDS IN PIPES SHALL HAVE MINIMUM RADIUS OF 100 ft.
2. CONTRACTOR SHALL INSTALL PIPE AS SHOWN AND COMPLY WITH MANUFACTURE HANDLING REQUIREMENTS. OWNER RESPONSIBLE FOR HDPE PIPE EXPANSION AND CONTRACTION ASSOCIATED WITH AMBIENT TEMPERATURE VARIATIONS.
3. SEE SHEET C14 FOR TYPICAL OUTLET PIPE TRENCH DETAIL.

VERTICAL
0 10 20 40
SCALE IN FEET

HORIZONTAL
0 50 100 200
SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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UNDER WATER DRAWING
APPROVED
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OUTLET PIPE
PLAN AND PROFILE
(SHEET 1 OF 3)

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C7

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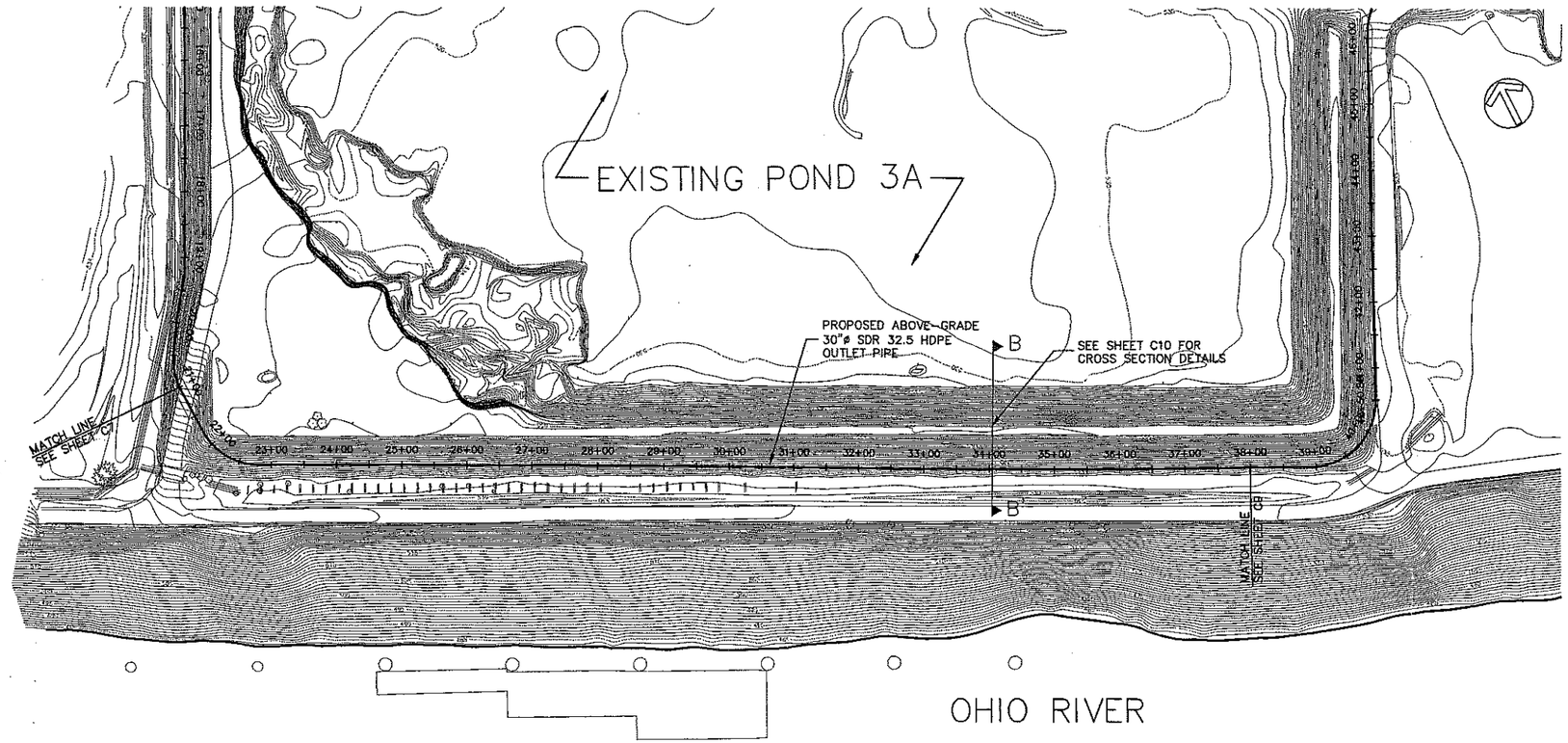
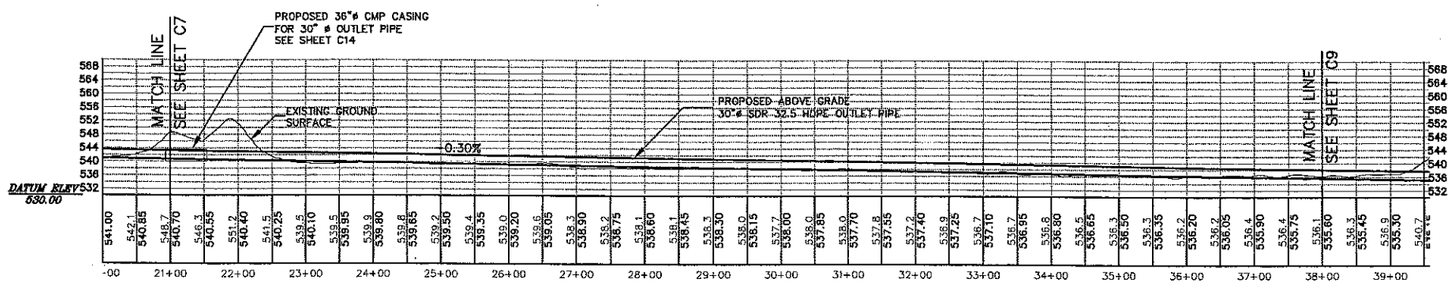


PLAN



PROFILE

VERTICAL
0 10 20 40
SCALE IN FEET

HORIZONTAL
0 50 100 200
SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

APPROVED
CONSTRUCTION WASTE DISPOSAL
LETTER OF APPROVAL
HEREBY ATTACHED
AS PART OF THE OPERATIONAL PERMIT

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OUTLET PIPE
PLAN AND PROFILE
(SHEET 2 OF 3)

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C8

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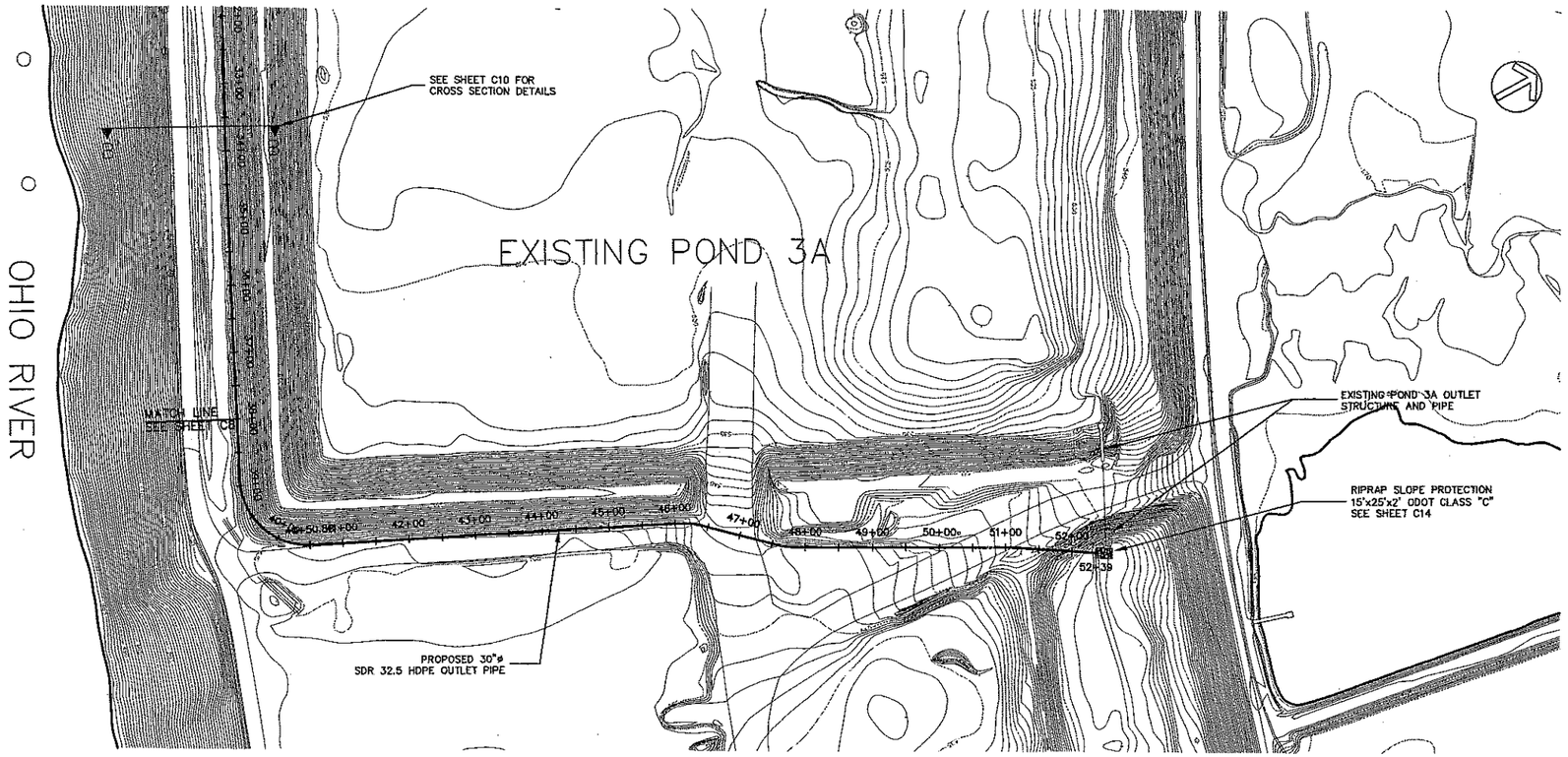
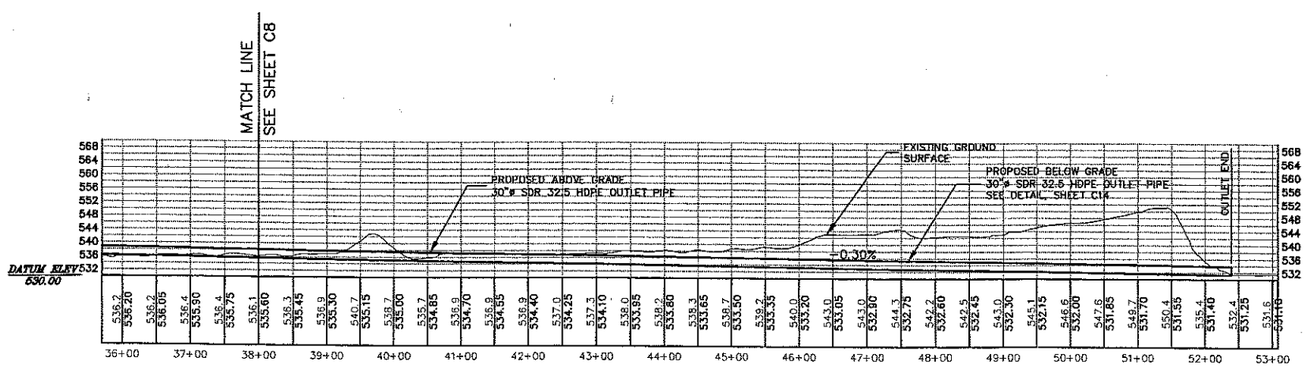


PLAN



PROFILE

NOTE:
BENDS IN PIPES SHALL HAVE MINIMUM RADIUS OF 100 ft.

VERTICAL
0 10 20 40
SCALE IN FEET

HORIZONTAL
0 50 100 200
SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

NOT FOR CONSTRUCTION
APPROVED
CITY OF DAYTON, DEPARTMENT OF WATER
AS BUILTS BY COPY OF LETTER OF APPROVAL WITH COMMENTS ATTACHED

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OUTLET PIPE
PLAN AND PROFILE
(SHEET 3 OF 3)

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C9

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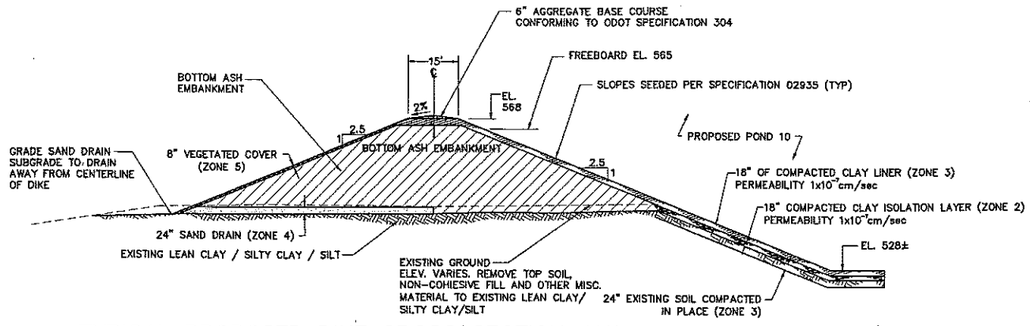
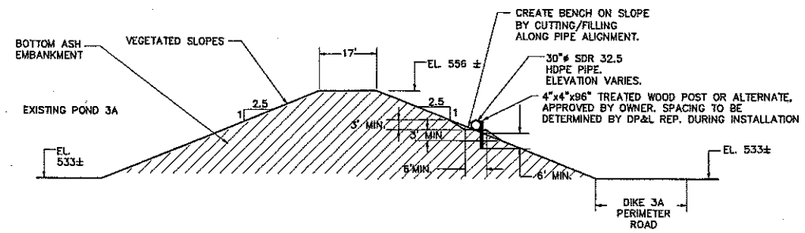


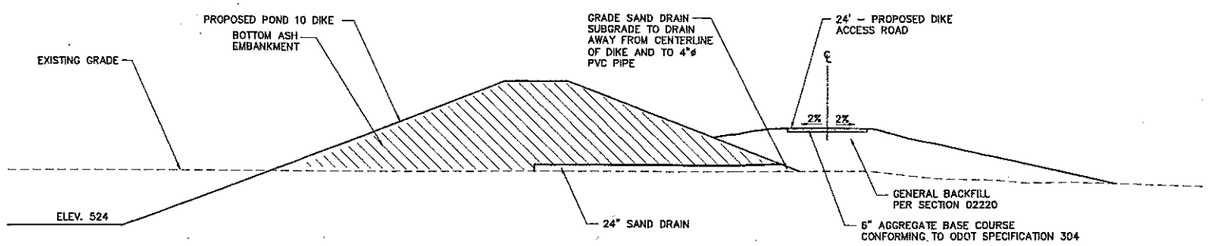
TYPICAL PROPOSED DIKE CROSS SECTION AND STRATIGRAPHY A–A'

SEE SHEET C5



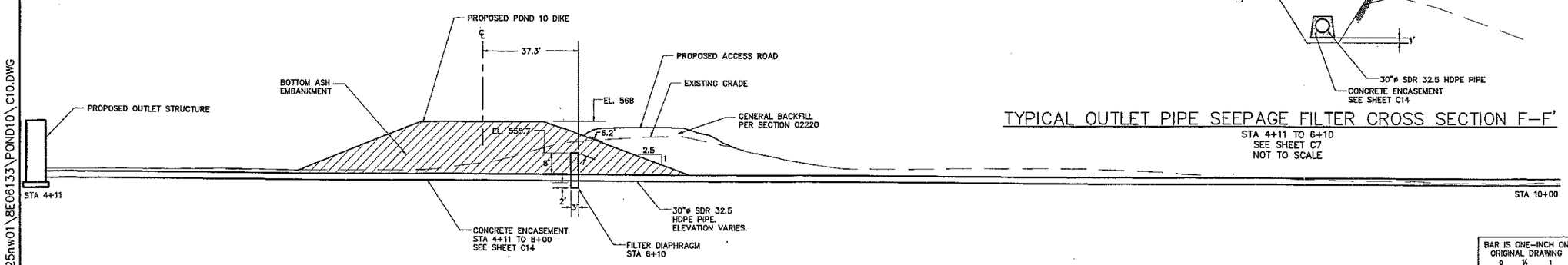
ABOVE GROUND OUTLET PIPE CROSS SECTION B–B'

SEE SHEET C7, C8 AND C9



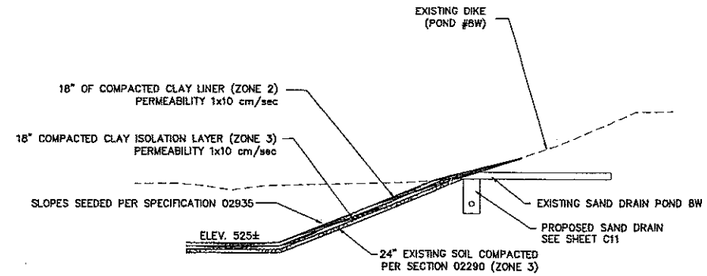
PROPOSED DIKE & ACCESS ROAD CROSS SECTION C–C'

SEE SHEET C6



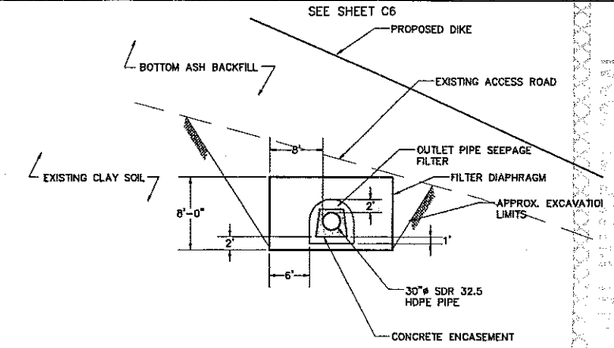
OUTLET PIPE PROFILE AND FILTER DIAPRAGM LOCATION

SEE SHEET C7



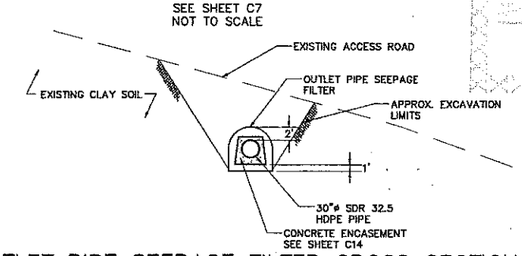
TYPICAL POND 8W TOE SAND DRAIN CROSS SECTION D–D'

SEE SHEET C6



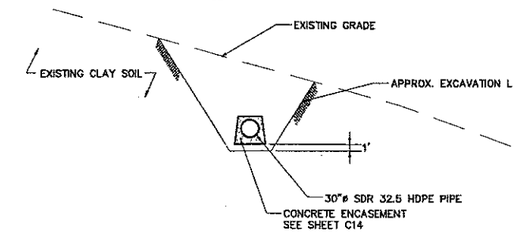
TYPICAL OUTLET PIPE FILTER DIAPHRAGM CROSS SECTION G–G'

STA 6+10
SEE SHEET C7
NOT TO SCALE



TYPICAL OUTLET PIPE SEEPAGE FILTER CROSS SECTION H–H'

STA 6+10 TO 8+00
SEE SHEET C7
NOT TO SCALE



TYPICAL OUTLET PIPE SEEPAGE FILTER CROSS SECTION F–F'

STA 4+11 TO 6+10
SEE SHEET C7
NOT TO SCALE

0 10 20 40
SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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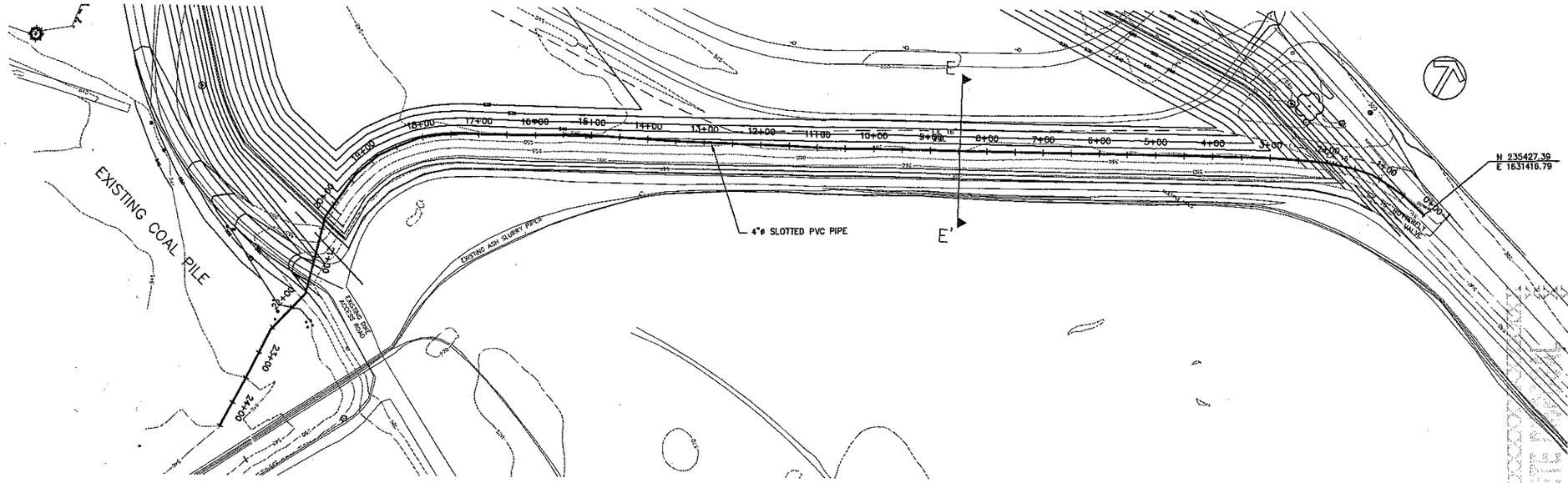
DIKE DETAILS

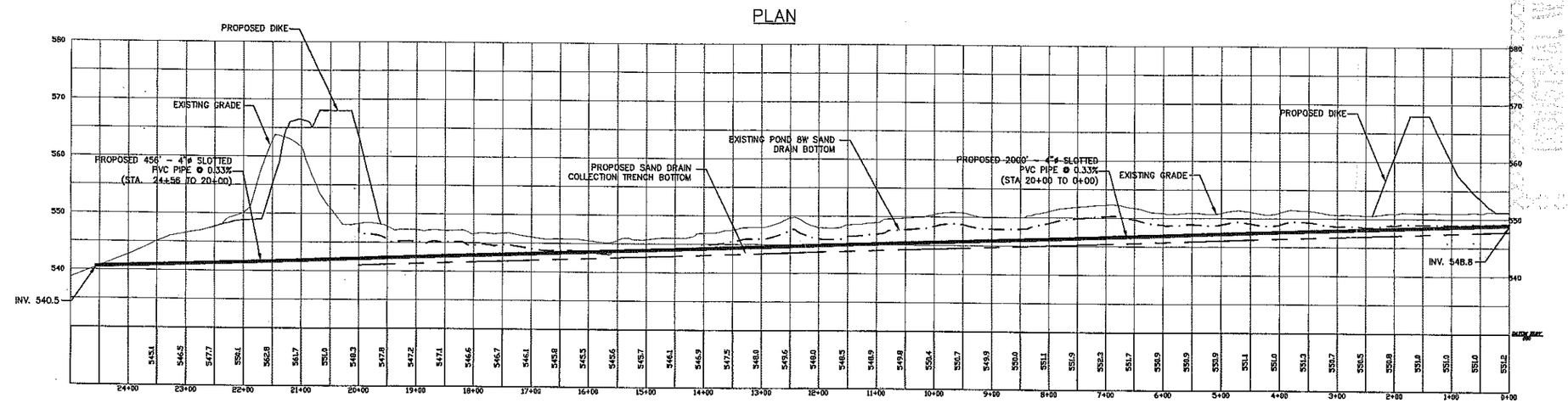
PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C10



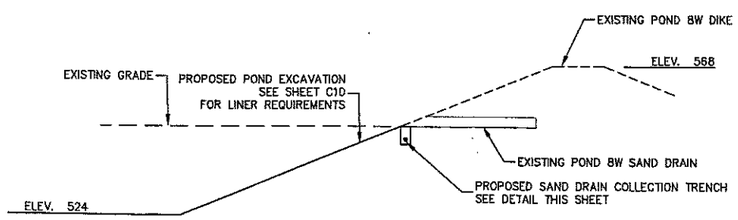
PLAN



PROFILE

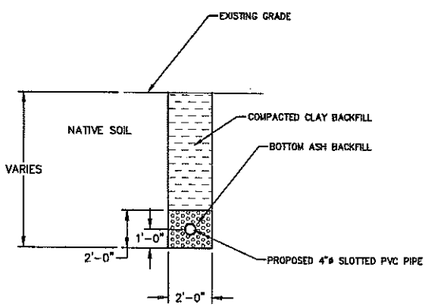
VERTICAL
0 5 10 20
SCALE IN FEET

HORIZONTAL
0 50 100 200
SCALE IN FEET



SECTION E–E'

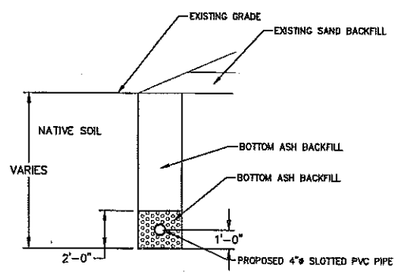
NOT TO SCALE



TYPICAL SAND DRAIN COLLECTION TRENCH DETAIL

STA 24+56 TO 20+00

NOT TO SCALE



TYPICAL SAND DRAIN COLLECTION TRENCH DETAIL

STA 20+00 TO 0+00

NOT TO SCALE

NOTES:

1. CONTRACTOR SHALL NOT EXCEED 40 LINEAL FT. BEFORE BACKFILLING PROPOSED TRENCH FOR SAND DRAIN UNLESS OTHERWISE APPROVED BY OWNER.

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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POND 8W DIKE SAND TOE DRAIN PLAN & PROFILE

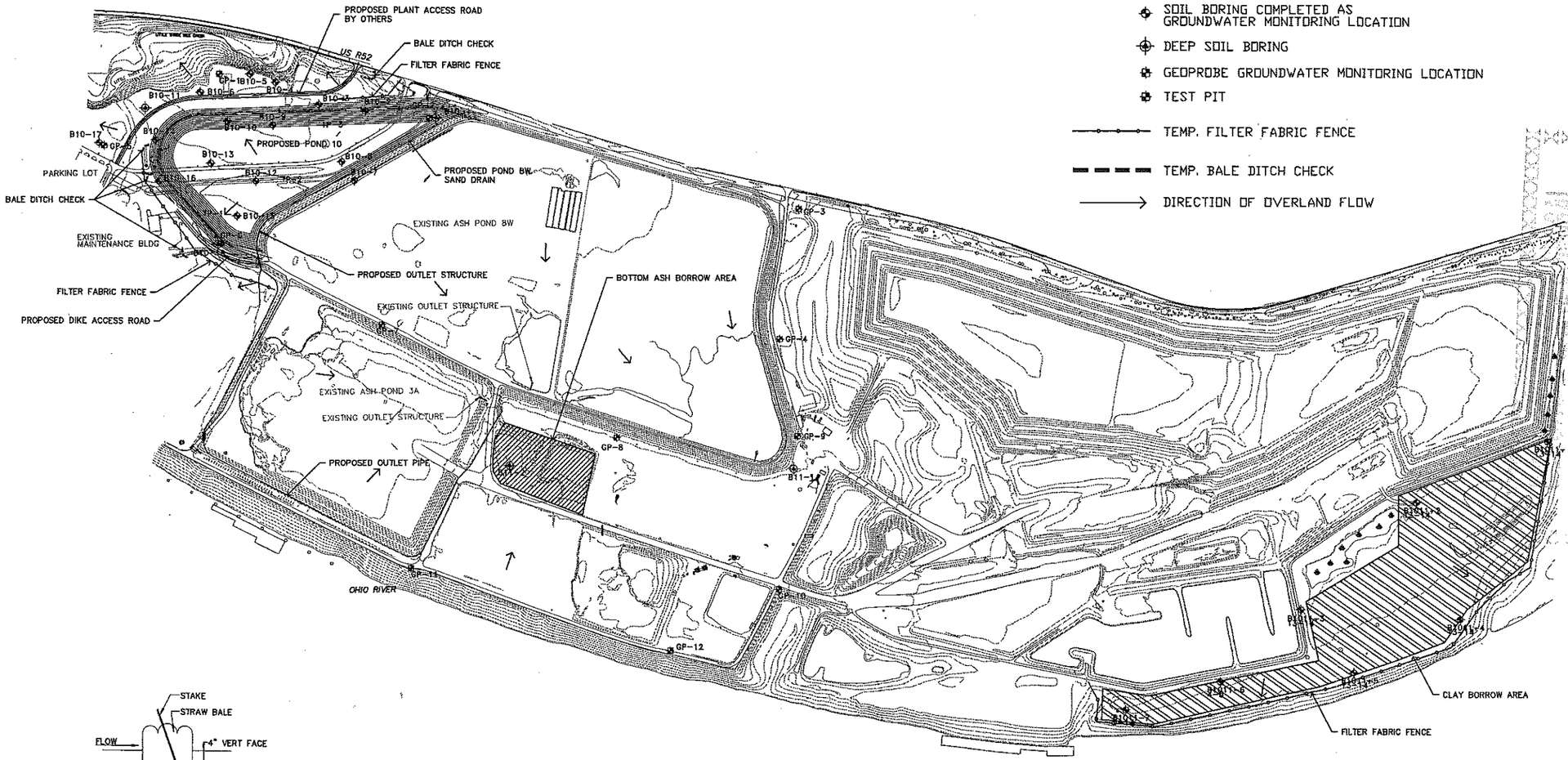
PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

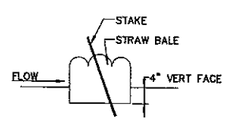
C11

SITE LEGEND

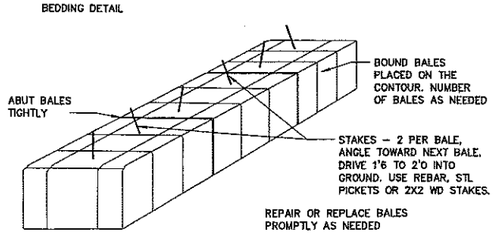
- SOIL BORING
- SOIL BORING COMPLETED AS GROUNDWATER MONITORING LOCATION
- DEEP SOIL BORING
- GEOPROBE GROUNDWATER MONITORING LOCATION
- TEST PIT
- TEMP. FILTER FABRIC FENCE
- TEMP. BALE DITCH CHECK
- DIRECTION OF OVERLAND FLOW



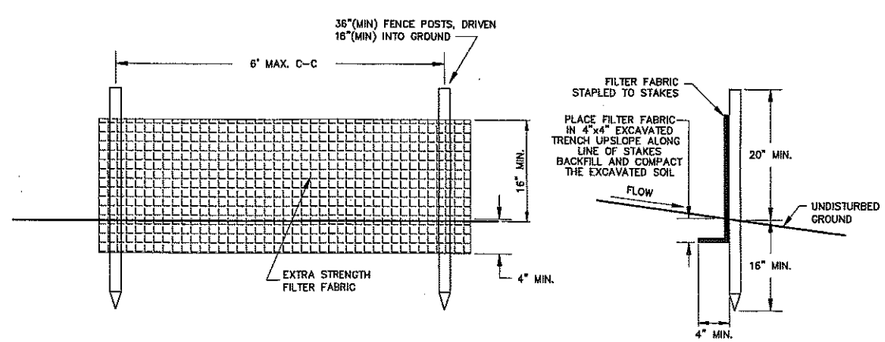
SITE PLAN



BEDDING DETAIL



BALE DITCH CHECK DETAIL



ELEVATION

SECTION

NOTE: WHEN TWO SECTIONS OF FENCE ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.

FILTER FABRIC FENCE

0 200 400 800
SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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NO.	DESCRIPTION	DATE	BY

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SCALE	AS SHOWN		

EROSION CONTROL AND BORING LOCATIONS

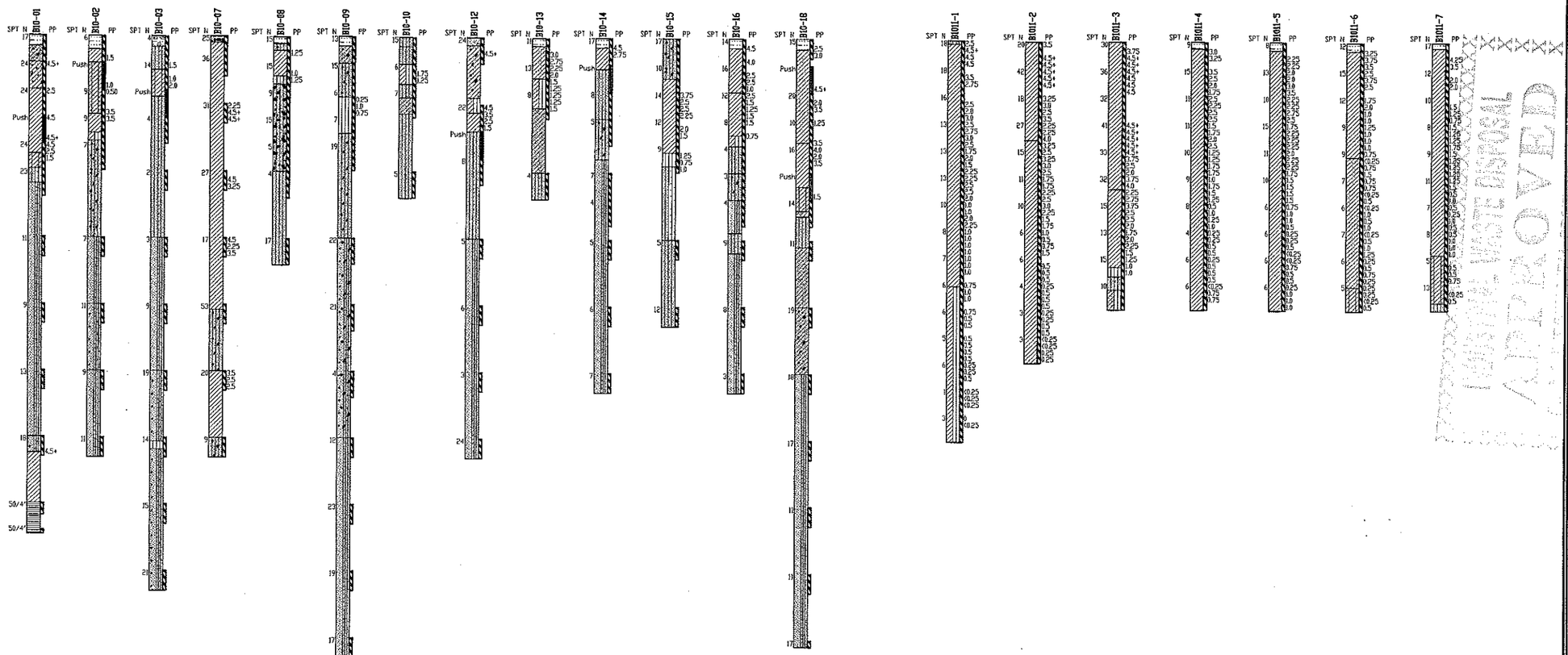
PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

C12

S025nw01\8E06133\POND10\C12.DWG

SOIL BORING LOGS



TYPICAL SOIL GRAPHIC SYMBOLS

- SAND (SP/SW)
- SAND with silt (SP–SM)
- Silty SAND (SM)
- Lean CLAY (CL)
- Silty CLAY (CL–ML)
- Clayey SAND (SC)
- SILT (ML)
- Silty CLAY to SILT (CL–ML/ML)
- GRAVEL (GP/GW)
- Topsoil
- Ash
- Debris Fill or Landfill Material

TYPICAL SAMPLER GRAPHIC SYMBOLS

- SPT Split Spoon
- Shelby Tube

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.
3. SPT N = Standard Penetration Test Number (blows per foot)
4. PP = Pocket Penetrometer (tons per square foot)

0 2 4 8
APPROXIMATE SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

S025nw01\8E06133\POND10\C13.DWG

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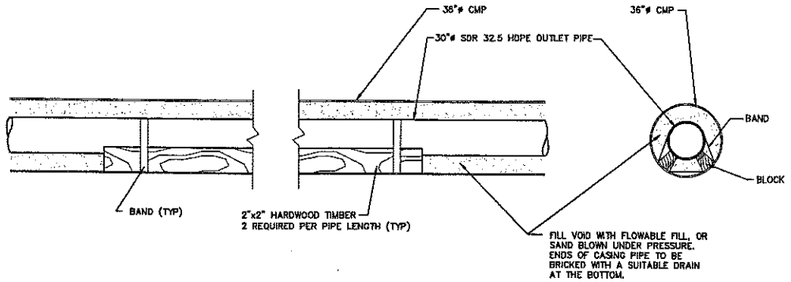
SOIL BORING LOGS

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

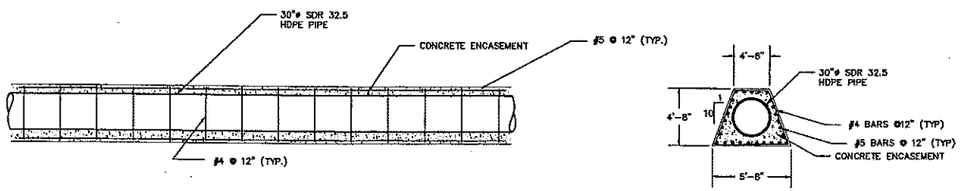
URS Greiner Woodward Clyde

C13



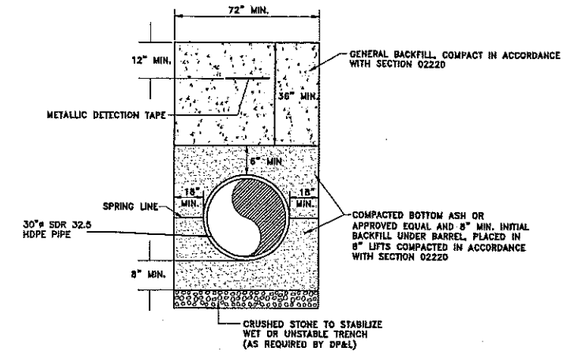
PIPE BLOCK DETAIL

NOT TO SCALE
SEE SHEET C7



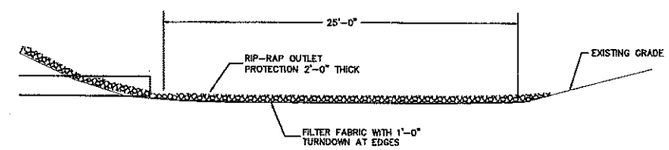
PIPE ENCASEMENT DETAIL

STA 4+11 TO 8+00
NOT TO SCALE
SEE SHEET C7



TYPICAL PIPE BEDDING DETAIL

STA 39+00 TO 52+50
NOT TO SCALE
SEE SHEETS C7, C8,AND C9



RIPRAP PROTECTION DETAIL

NOT TO SCALE
SEE SHEET 9

NOTE:

1. CONTRACTOR MAY PROPOSE ALTERNATIVE PIPE BLOCK AND ENCASEMENT PLAN. ALTERNATIVE PLAN TO BE REVIEWED AND APPROVED BY OWNER PRIOR TO INSTALLATION.

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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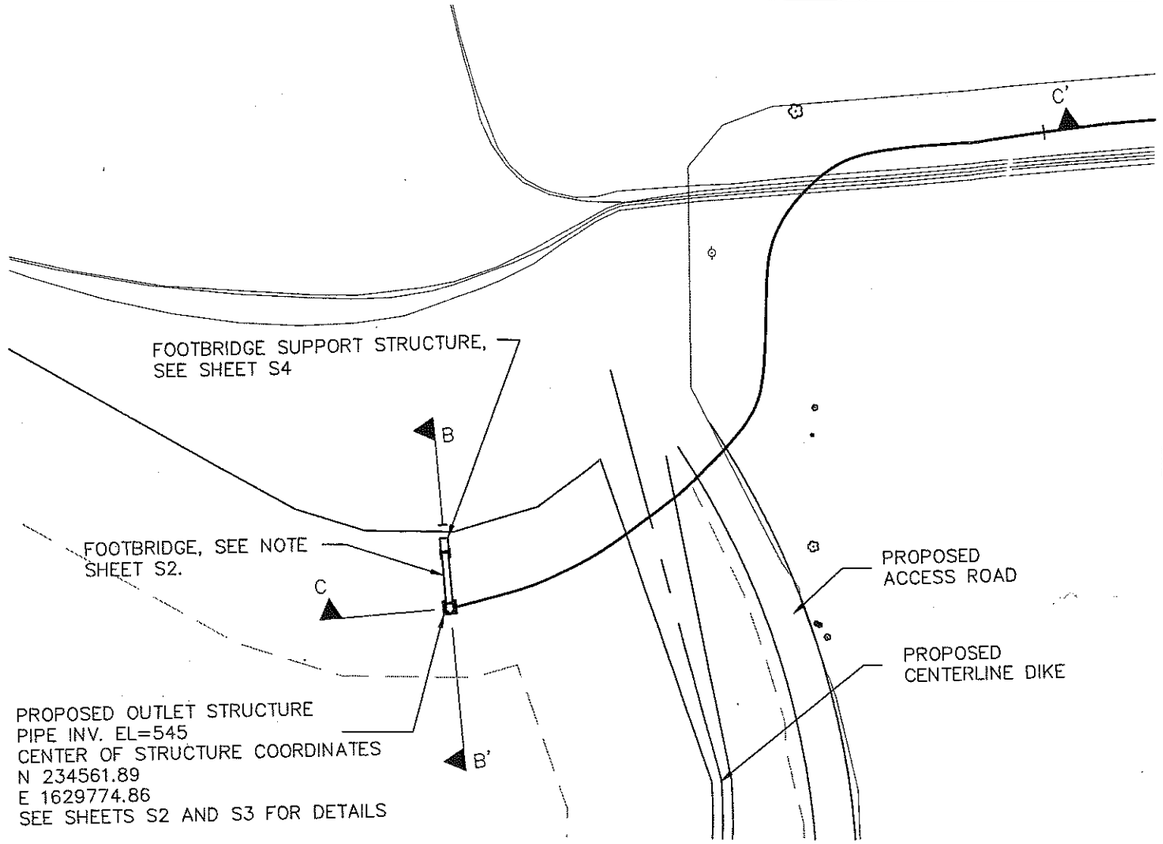
OUTLET PIPE DETAILS

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

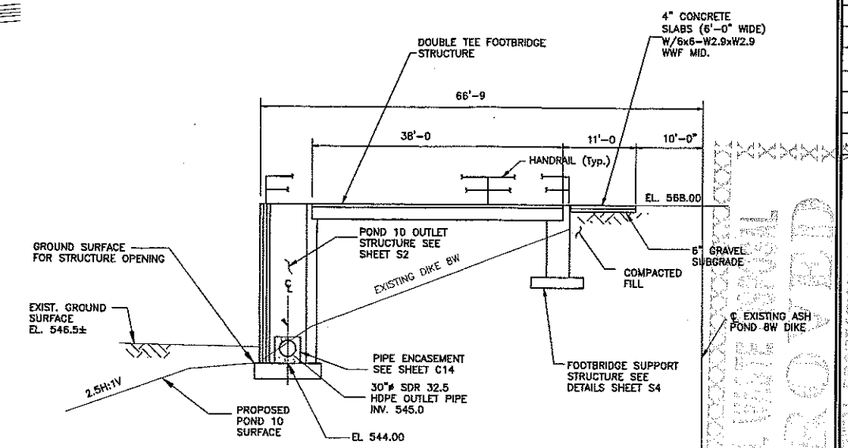
URS Greiner Woodward Clyde

C14

S025nw01\8E06133\POND10\C14.DWG



OUTLET STRUCTURE PLAN

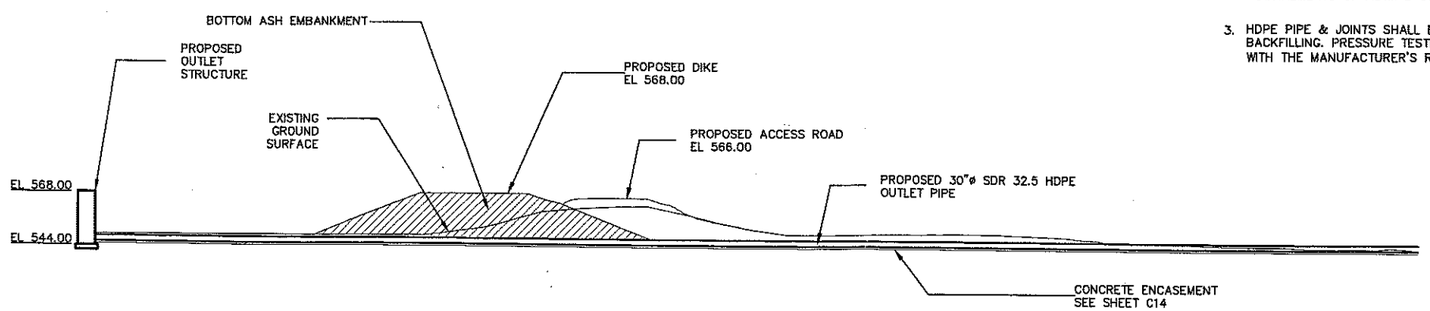


CROSS SECTION B-B'
PROPOSED ASH POND 10 OUTLET STRUCTURE
AND DOUBLE TEE FOOTBRIDGE STRUCTURE

SCALE 1" = 10'

NOTES:

1. HDPE PIPE BETWEEN POND 10 OUTLET STRUCTURE AND OUTLET TO POND 6 SHALL BE CSR POLYPIPE EHMW PE 3406 30-INCH INSIDE DIAMETER SDR 32.5 HDPE PIPE OR AN APPROVED EQUAL.
2. HDPE PIPE MATERIAL SHALL CONFORM TO ASTM D1248. PIPE JOINTS SHALL BE BUTT-FUSED ACCORDING TO THE REQUIREMENTS OF ASTM D3261 AND PPI TR-33. PIPE CELL CLASSIFICATION SHALL MEET THE REQUIREMENTS OF ASTM D 3350.
3. HDPE PIPE & JOINTS SHALL BE LOW PRESSURE AIR TESTED PRIOR TO BACKFILLING. PRESSURE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



CROSS SECTION C-C'
PROPOSED ASH POND 10 OUTLET STRUCTURE AND PIPE PROFILE

VERTICAL
0 15 30 60
SCALE IN FEET

HORIZONTAL
0 15 30 60
SCALE IN FEET

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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PROPOSED POND 10
DP&L - JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

S1

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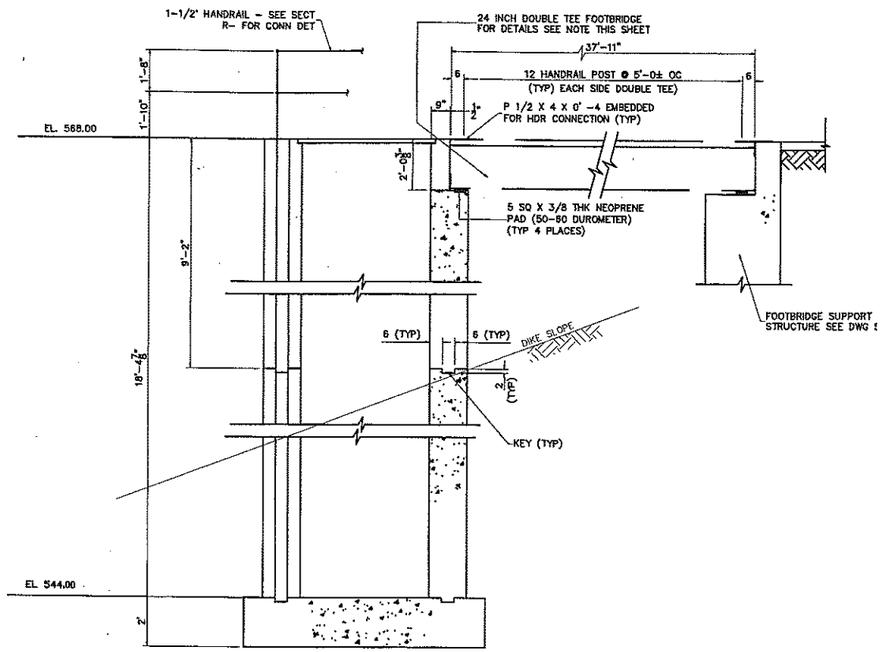
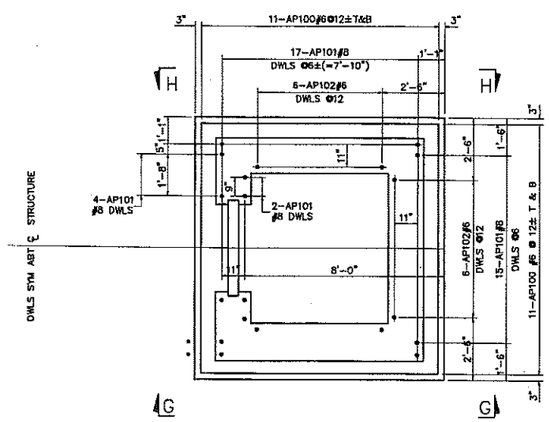


SECTION A

SCALE: 3/8" = 1'-0"

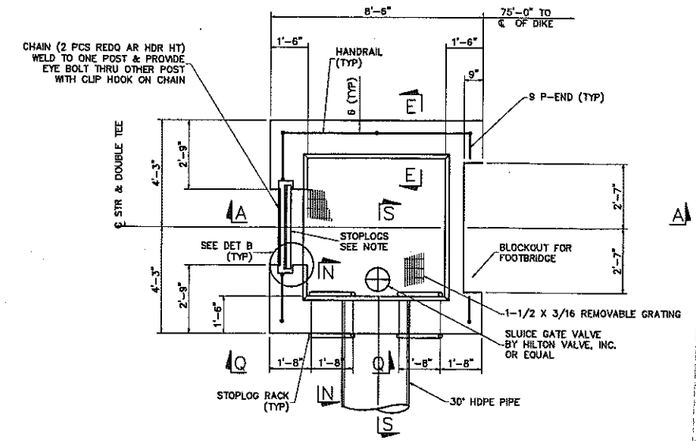


OUTLET STRUCTURE

PLAN @ EL. 544.00 - REINF

SCALE: 3/8" = 1'-0"

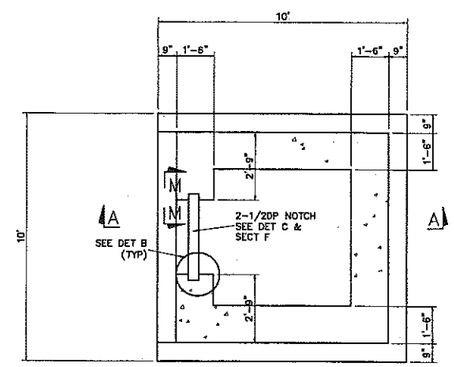
NOTE: CUT, SHIFT OR BEND DOWELS AS REQUIRED FOR INSTALLATION OF 30"ø HDPE PIPE.



OUTLET STRUCTURE

PLAN @ EL. 568.00 - MAS

SCALE: 3/8" = 1'-0"



OUTLET STRUCTURE

PLAN @ EL. 544.00 - MAS

SCALE: 3/8" = 1'-0"

NOTES:

SEE SHEET S3 FOR OUTLET STRUCTURE DETAILS AND SECTIONS B THRU S.

DOUBLE TEE FOR FOOTBRIDGE SHALL BE PRESTRESSED CONCRETE 24 INCH x 5'-0 DOUBLE TEE CHANNEL WITH 4 INCH x 6: INCH STEMS, WITHOUT TOPPING, AS MANUFACTURED BY PRESTRESS SERVICES OF KENTUCKY, INC., OR APPROVED ALTERNATE. THE DOUBLE TEE SHALL BE DESIGNED TO SUPPORT A SUPERIMPOSED LIVE LOAD OF 100 PSF. MEMBER DIMENSIONS SHALL BE DETERMINED BY THE MANUFACTURER TO SAFELY MEET THE SPAN, LOAD AND HANDRAIL ATTACHMENT REQUIREMENTS SHOWN ON THE DRAWING WITH THE EXCEPTION THAT THE OUT-TO-OUT DIMENSIONS SHALL BE 5'-0 AND THE OVERALL DEPTH SHALL BE 24 INCHES. DESIGN SHALL BE IN ACCORDANCE WITH ACI 318-95 UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF OHIO. COMPUTATIONS SHALL BE SUBMITTED WITH SHOP DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURE AND SHALL BEAR THE SEAL OF THE PROFESSIONAL ENGINEER WHO PERFORMED OR APPROVED THE DESIGN. CONCRETE MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF ACI 318-95.

STOPLOGS SHALL CONSIST OF 13-MC18x42.7 (3'-4 LG) WITH A 1ø HOLE IN THE TOP FLANGE FROM EACH END.

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 ½ 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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OUTLET STRUCTURE DETAILS

PROPOSED POND 10
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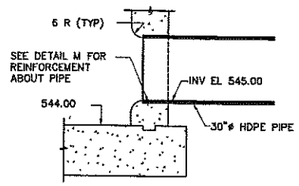
ABERDEEN, OHIO

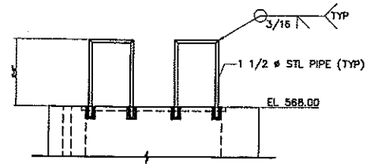
URS Greiner Woodward Clyde

S2

S025nw01\8E06133\POND10\S2.DWG



SECT S
SCALE: 3/8" = 1'-0"



SECTION Q
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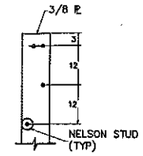
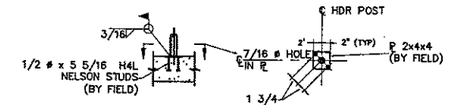
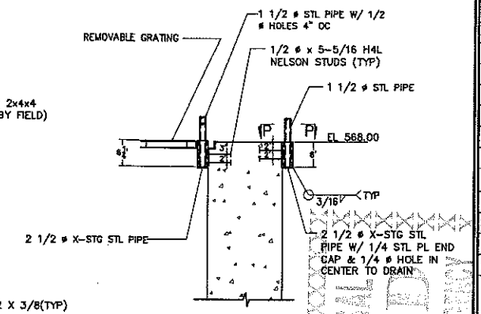


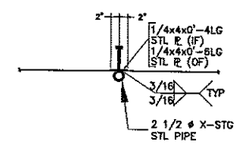
DET D
NTS



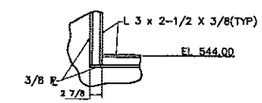
SECTION R
3/4"=1'-0"



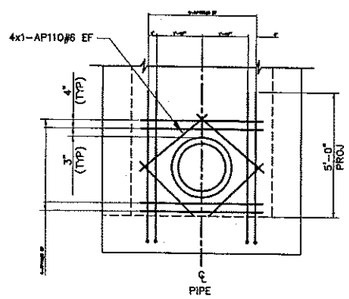
SECT N
3/4" = 1'-0"



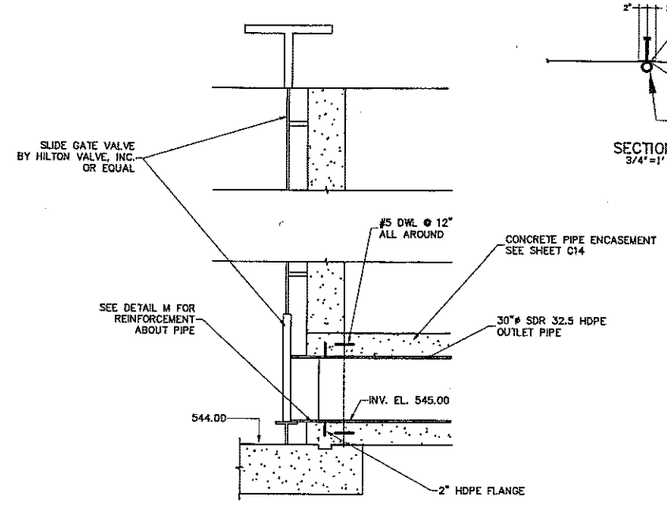
SECTION P
3/4"=1'-0"



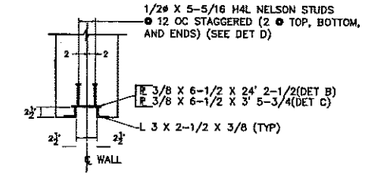
SECT F
3/4" = 1'-0"



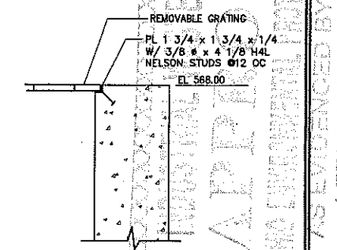
DETAIL M
SCALE: 3/8" = 1'-0"



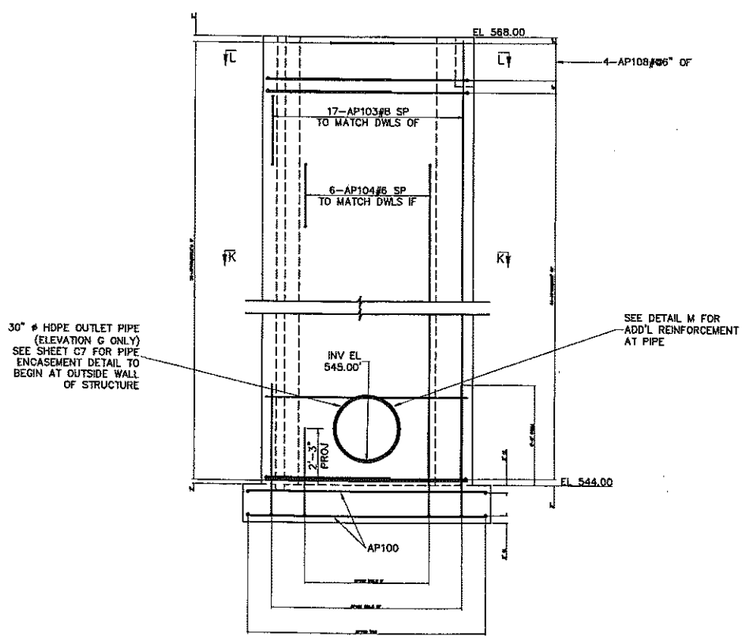
SECTION S
SCALE: 3/8" = 1'-0"



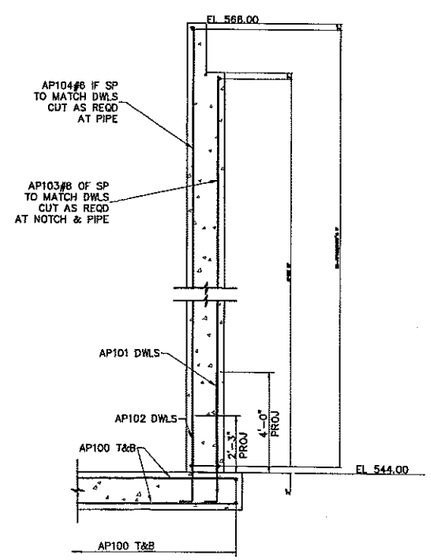
DET B AS SHOWN & NOTED
DET C AS SHOWN & NOTED
3/4" = 1'-0"



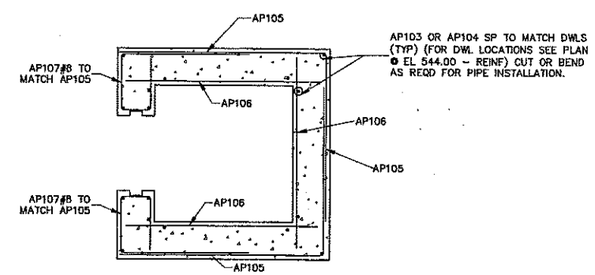
SECT E
3/4" = 1'-0"



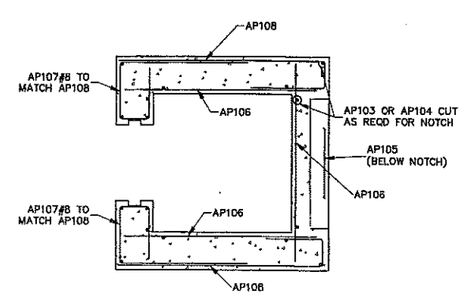
ELEVATION G AS SHOWN
ELEVATION H OPPPOSITE HAND
SCALE: 3/8" = 1'-0"



SECTION J
SCALE: 3/8" = 1'-0"



SECTION K
SCALE: 3/8" = 1'-0"



SECTION L
SCALE: 3/8" = 1'-0"

BAR IS ONE-INCH ON ORIGINAL DRAWING
0 1/2 1
IF NOT ONE-INCH, THEN ADJUST SCALES ACCORDINGLY

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OUTLET STRUCTURE DETAILS

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DP&L – JM STUART
ABERDEEN, OHIO

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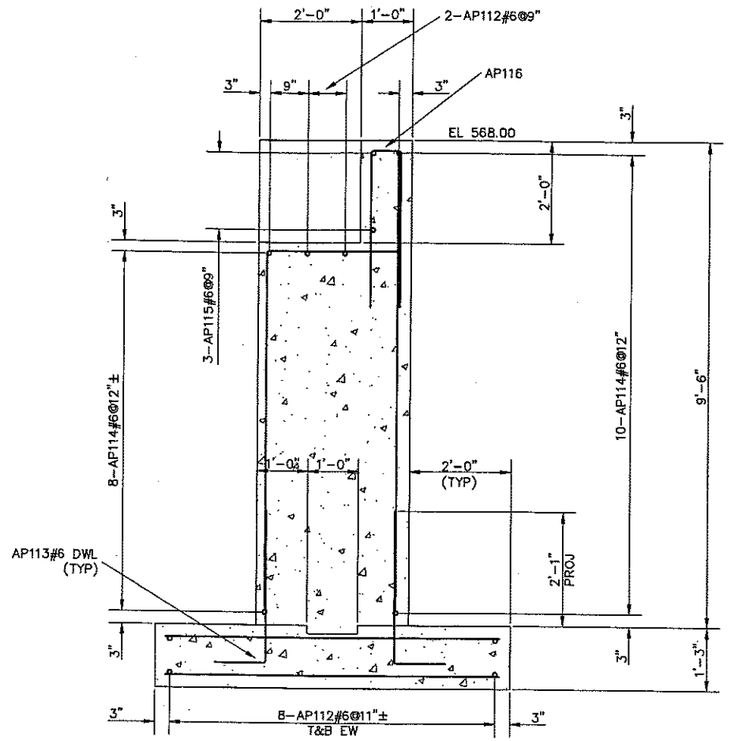
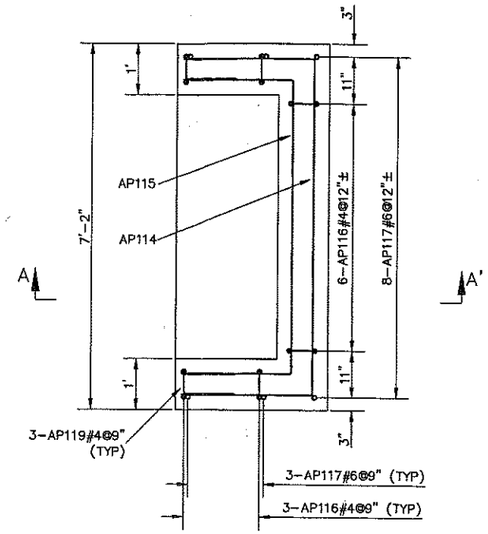
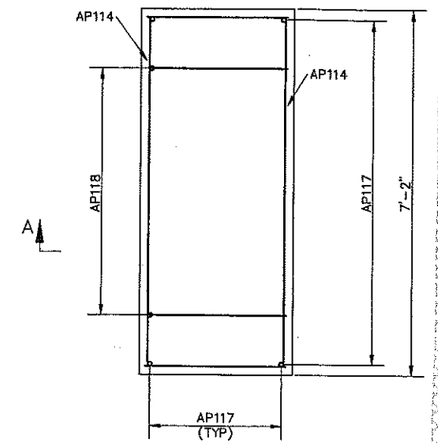


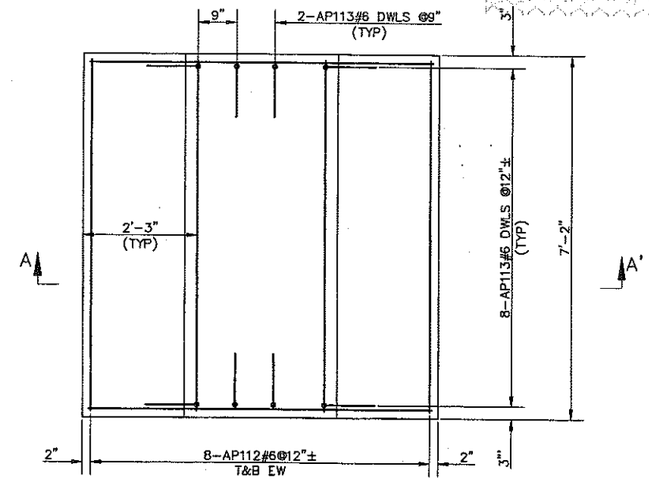
SECTION A
3/4" = 1'-0"



PLAN @ EL 568.00
3/4" = 1'-0"



PLAN @ EL 566.00
3/4" = 1'-0"



PLAN – FOOTING
FOOTBRIDGE SUPPORT
STRUCTURE
3/4" = 1'-0"

BAR BENDING SCHEDULE

MARK	QTY	SIZE	LGTH	TYPE	A	B	C	D	E	F / F'	G	H / H'	J	K	L	REMARKS
AP100	44	#9	9'-8"	STR												
AP101	81	#5	7'-1"	2	1'-4"	5'-9"										
AP102	18	#5	5'-0"	2	1'-0"	4'-0"										
AP103	61	#8	23'-10"	STR												
AP104	18	#9	23'-10"	STR												
AP105	88	#8	14'-5"	2	6'-3"	8'-2"										
AP106	72	#9	8'-0"	STR												
AP107	96	#5	9'-9"	16	2'-4"	1'-1"	2'-4"	4'-0"				4'-0" G				
AP108	8	#8	11'-10"	2	8'-2"	1'-4"	2'-4"									
AP109	8	#5	7'-0"	2	1'-0"	6'-0"										
AP110	18	#6	5'-0"	STR												
AP111	LF	#5	125	STR												CUT TO SUIT IN FIELD
AP112	34	#6	6'-10"	STR												
AP113	20	#6	4'-0"	2	1'-0"	3'-0"										
AP114	18	#6	12'-2"	2	2'-8"	6'-10"	2'-8"									
AP115	3	#6	9'-6"	2	2'-0"	5'-8"	2'-0"									
AP116	12	#4	5'-8"	S4	3'-0"	8"	3'-0"									
AP117	14	#6	9'-4"	STR												
AP118	6	#6	10'-0"	2	2'-8"	7'-4"										
AP119	6	#4	2'-8"	S4	1'-0"	8"	1'-0"									

BAR SIZE WEIGHT (LB)

#3	
#4	60
#5	130
#6	4,495
#7	
#8	13,915
#9	
#10	
#11	
#14	
#18	
TOTAL WEIGHT	18,600

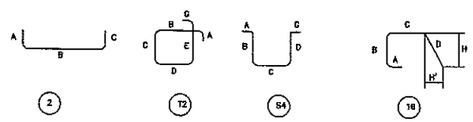
NOTES.

CURRENT ACI STANDARDS SHALL GOVERN FOR ALL REINFORCING BAR DETAILS.
TOLERANCES FOR BENDING SHALL BE AS DEFINED IN MANUAL OF STANDARD PRACTICE CRSI 1976.
ALL BARS SHALL BE BENT COLD.
ALL HOOKS AND BENDS SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF THE CURRENT ACI STANDARDS UNLESS NOTED.
BENDING DIMENSIONS ARE OUT TO OUT EXCEPT "A" AND "G" ON STD 180' AND 135' HOOKS.
DIMENSIONS OMITTED ARE ZERO.
ALL REINFORCING BARS, UNLESS NOTED, SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATION 03200
NO REROLLED MATERIAL WILL BE ACCEPTED.
LENGTHS SHOWN ARE NOMINAL AND BASED ON OUT TO OUT DIMENSIONS OF BENT BARS.

S – PREFIX FOR STIRRUPS
T – PREFIX FOR TIES
EA – EACH
STR – STRAIGHT
Δ – INCREMENT
X – INDICATES BARS WITH CADWELD SPLICE.
– LENGTH INDICATED IS FINISHED LENGTH.
⊗ – INDICATES BARS TO BE BENT IN FIELD.

THIS SCHEDULE COVERS GRADE 60 STEEL.

REINFORCING BAR TYPES



NOTE: CONTRACTOR TO VERIFY ALL LENGTHS AND QUANTITIES

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SCALE	AS SHOWN		

OUTLET STRUCTURE DETAILS

PROPOSED POND 10
DP&L – JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

S4

BAR IS ONE-INCH ON ORIGINAL DRAWING
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APPROVED
CONDITIONAL APPROVAL
AS EMBODIED BY COPY OF
LETTER OF APPROVAL

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GENERAL NOTES:

1. TRENCH BOTTOM FOR OUTLET PIPE SHALL BE BROUGHT TO GRADE WITH 8 INCHES OF BEDDING MATERIAL. BEDDING MATERIAL SHALL BE EVENLY SPREAD THROUGHOUT TRENCH AT THE PROPER GRADE TO PROVIDE SUPPORT UNDER PIPE. IF SOFT MATERIAL IS ENCOUNTERED IN TRENCH BOTTOM, IT SHALL BE EXCAVATED AND BACKFILLED WITH BEDDING MATERIAL AND COMPACTED. BEDDING MATERIAL SHALL BE A FINE AGGREGATE WITH LESS THAN 10 PERCENT PASSING THE No. 200 SIEVE AND 100 PERCENT LESS THAN 3/4-INCH DIAMETER, DP&L BOTTOM ASH, SP-SM, SW-SM, OR AND APPROVED EQUAL.
2. INITIAL BACKFILL SHALL BE PLACED IN LIFTS TO ALLOW PLACEMENT OF PIPE. THE FINAL LIFT SHALL BE COMPACTED WITH A VIBRATORY PLATE OR TAMPER. INITIAL BACKFILL MATERIAL SHALL HAVE THE SAME SPECIFICATION AS THE BEDDING MATERIAL.
3. FINAL BACKFILL SHALL CONSIST OF THE EXCAVATED MATERIAL PROVIDED IT IS FREE OF ORGANICS, DEBRIS LARGER THAN 6 INCHES AND DELETERIOUS MATERIALS. BACKFILL SHALL BE PLACED IN 12-INCH LOOSE LIFTS AND COMPACTED TO 98 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY.
4. ALL DISTURBED AREAS SHALL BE SEEDED, FERTILIZED, AND MULCHED PER SPECIFICATION 02935 OR AS DIRECTED BY DP&L.
5. FINAL LOCATIONS OF ALL NEW PIPING AND FITTINGS SHALL BE APPROVED BY DP&L PRIOR TO INSTALLATION.
6. TRENCH SHORING SHALL CONFORM TO OSHA STANDARD 29 CFR, SUBPART 8, SECTIONS 1926.650 TO 1926.653.
7. REMOVE AND STOCKPILE EXISTING TOPSOIL FROM ENTIRE POND FOOTPRINT.
8. AS NEEDED REMOVE EXISTING 1' OF SILTY SAND TO EXPOSE LEAN CLAY/SILTY CLAY/SILT FROM ENTIRE DIKE FOOTPRINT.
9. PLACE 2' THICK SAND DRAIN ON SURFACE THAT IS SLOPED FROM DIKE CENTER TO DOWNSTREAM SLOPE TOE.
10. SAND DRAIN SHALL HAVE A PEMEABILITY OF 1X10 cm/sec MINIMUM.
11. THE POND LINER AND ISOLATION LAYER SHALL BE IN PHYSICAL CONTACT WITH THE EXISTING LEAN CLAY/SILTY CLAY/SILT LAYERS TO FORM A CONTINUOUS AQUIFER PROTECTION SYSTEM.

STRUCTURAL NOTES

1. CONCRETE SHALL BE CLASS "3" (4,000 PSI) UNLESS NOTED AND SHALL BE IN ACCORDANCE WITH SPECIFICATIONS, SEE SPECIFICATION 03300.
2. FOR CONCRETE REINFORCING STEEL SPECIFICATIONS, SEE SPECIFICATION 03200.
3. PLACING DIMENSIONS ARE GIVEN TO THE CENTER OF BARS UNLESS OTHERWISE NOTED.
4. SHIFT OR BEND BARS TO CLEAR ANCHOR BOLTS, DRAINS, PIPE SLEEVES, AND EMBEDDED PARTS.
5. ALL BARS SHALL HAVE 2 INCH MINIMUM CONCRETE COVER UNLESS OTHERWISE NOTED.
6. MINIMUM SPLICE LENGTH FOR FIELD CUT REINFORCING BARS SHALL BE AS FOLLOWS:
   2' - 6' FOR #4 BARS
   3' - 0' FOR #5 BARS
7. UNLESS NOTED ON DRAWINGS, NO WELDING (INCLUDING TACK WELDING) TO CONCRETE REINFORCING STEEL SHALL BE PERMITTED WITHOUT APPROVAL OF THE OWNER.
8. ALL ANCHOR BOLTS, DRAIN PIPES, PIPE SLEEVES, ELECTRICAL CONDUITS, AND EMBEDDED PARTS SHALL BE IN POSITION BEFORE CONCRETE IS PLACED.
9. ALL STEEL (INCLUDING EMBEDDED STEEL) SHALL BE GALVANIZED ASTM A36 UNLESS OTHERWISE NOTED. ALL BOLTS SHALL BE GALVANIZED ASTM A307 UNLESS OTHERWISE NOTED.
10. CONCRETE SHALL BE ROUGHENED AND A BONDING AGENT SHALL BE PLACED AT ALL CONSTRUCTION JOINTS.

GRADING NOTES

1. PRIOR TO STRIPPING, EXCAVATION, BACKFILL, FILLING, OR GRADING, CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL FACILITIES IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATION 02930.
2. SITE STRIPPING LIMITS SHALL BE DESIGNATED BY THE OWNER. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL OF THE OWNER BEFORE COMMENCING STRIPPING IN ANY AREA.
3. ALL CLEARING, STRIPPING, EXCAVATION, BACKFILL, FILLING OR GRADING SHALL BE IN ACCORDANCE WITH SPECIFICATIONS 02110, 02220, 02290.
4. PERMANENT FILL SLOPES SHALL BE CONSTRUCTED 2.5 HORIZONTAL TO 1 VERTICAL.
5. ELEVATIONS SHOWN ARE FINISH ELEVATIONS, UNLESS OTHERWISE NOTED.

DRAINAGE NOTES

1. CONTRACTOR SHALL FURNISH HIGH QUALITY MATERIALS AND WORK MEETING THE REQUIREMENTS OF THE SPECIFICATIONS AND INDUSTRY STANDARDS. CONTRACTOR'S WORK SHALL INCLUDE DETAILING AND DELIVERY OF DRAINAGE SYSTEMS AND ACCESSORIES AS SHOWN ON THE DRAWINGS, PROVIDING COMPLETE INSTALLATION, INCLUDING TRENCHING, BEDDING, BACKFILLING, AND COMPACTION.
2. PIPES SHALL BE LAID AS DESCRIBED IN PIPE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

   DURING JOINT ASSEMBLY, PIPES SHALL BE CAREFULLY ALIGNED AND THE PIPE SECTIONS FULLY SUPPORTED PRIOR TO JOINING.
3. THE WIDTH OF TRENCHES AT ANY POINT BELOW THE TOP OF THE PIPE SHALL NOT BE GREATER THAN NECESSARY TO PERMIT SATISFACTORY JOINTING AND COMPACTION OF THE FOUNDATION AND BEDDING MATERIAL UNDER AND AROUND THE PIPE.
4. SHEETING/BRACING AND BENCHING TO STABILIZED EMBANKMENTS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE SAFETY CODES AND STANDARDS.
5. ROCKS AND BOULDERS, AND ANY ORGANIC MATERIAL ENCOUNTERED DURING THE EXCAVATION OF TRENCHES SHALL BE REMOVED AND BE REPLACED WITH SUITABLE SELECTED MATERIALS AS DIRECTED BY THE OWNER.
6. MINIMUM COVER FOR ALL PIPES SHALL BE THREE FEET UNLESS NOTED OTHERWISE ON THE DRAWINGS, WHEEL LOADS SHALL NOT BE PERMITTED ON THE PIPES UNTIL THE MINIMUM COVER OF WELL COMPACTED BACKFILL HAS BEEN PLACED OVER THE PIPES, UNLESS OTHERWISE APPROVED BY THE OWNER.
7. TRENCHES SHALL BE DEWATERED PRIOR TO PIPE INSTALLATION.
8. ALL PIPE ELEVATIONS SHOWN ON THE DRAWINGS ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED.
9. DRAINAGE COMPUTATIONS ARE BASED ON A 10-YEAR FREQUENCY STORM AND A MINIMUM TIME OF CONCENTRATION OF 10 MINUTES.
10. FILTER FABRIC SHALL BE IN ACCORDANCE WITH SPECIFICATION 02275. INSTALLATION SHALL BE AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION.
11. ALL CORRUGATED METAL PIPE (CMP) TO BE BITUMINOUSLY COATED.

REFERENCE SPECIFICATIONS

1. ALL MATERIALS AND SERVICES SHALL BE PROVIDED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:

   TECHNICAL SPECIFICATIONS

   DIVISION 1 - GENERAL REQUIREMENTS
   01010 SUMMARY OF WORK

   DIVISION 2 - SITEWORK
   02050 DEMOLITION
   02110 CLEARING AND GRUBBING
   02220 EXCAVATION AND BACKFILL
   02225 DUST CONTROL
   02275 RIPRAP
   02290 EARTH DIKES
   02600 CORRUGATED METAL PIPE
   02610 PVC PIPE
   02611 HIGH DENSITY POLYETHELINE PIPING
   02930 EROSION CONTROL MEASURES
   02935 RECLAMATION OF CONSTRUCTION AREAS
   03100 CONCRETE FORMWORK
   03200 CONCRETE REINFORCEMENT
   03300 CAST-IN-PLACE CONCRETE
   05500 METAL FABRICATIONS
   05520 HANDRAILS
   13500 EMBANKMENT INSTRUMENTATION
   13990 OUTLET WORKS
2. FOR ADDITIONAL REQUIREMENTS, STANDARDS, AND SPECIFICATIONS, SEE THE LATEST EDITION OF THE FOLLOWING:

   -STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS
3. MATERIALS SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS, UNLESS OTHERWISE SPECIFIED:
4. ANY CONFLICT BETWEEN THE ABOVE LISTED SPECIFICATIONS, CODES, AND STANDARDS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE OWNER FOR WRITTEN RESOLUTION.

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NOTES

PROPOSED POND 10
DP&L - JM STUART
ABERDEEN, OHIO

URS Greiner Woodward Clyde

N1

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APPENDIX 6
Excerpt from:
"Pond 10 Dam Inspection Report," by DP&L, dated 11 June 2013
Survey Monitoring Point Data

FINAL PLAN

GROUNDWATER MONITORING PROGRAM

PROPOSED ASH POND 10
J M STUART STATION
ABERDEEN, OHIO

Prepared for
Dayton Power & Light
JM Stuart Generating Station
Aberdeen, Ohio

July 1, 1999

URS Greiner Woodward Clyde
A Division of URS Corporation

30775 Bainbridge Road
Suite 200
Solon, Ohio 44139
440/349-2708

Project No. 38-08E06133.00

3.1 MONITORING WELL LOCATIONS

To provide sufficient coverage for groundwater monitoring, seven new monitoring wells are planned. The new monitoring wells (designated as MW10-1 through MW10-7) will be installed around the perimeter of Pond 10. A proposed monitoring well location map is presented as **Figure 2**. This configuration provides two wells that are expected to be upgradient of Pond 10 (MW10-1 and MW10-2), and five wells that are expected to be downgradient or sidegradient of Pond 10 (MW10-3 through MW10-7).

3.2 MONITORING WELL INSTALLATION

Each well will be constructed of 2-inch diameter, Schedule 40 PVC, with a 20-foot screened section installed such that approximately half of the screened interval is located above the groundwater level encountered during drilling. The annular space of each boring will be backfilled with a sand filter pack to approximately 2 feet above the screened interval. Above the sand pack, a 2-foot bentonite seal will be placed, and the remainder of the hole will be grouted with a cement-bentonite mixture.

Locking, steel, protective casings will be installed over each well and brightly colored steel guard posts will be installed to protect the wells from damage. In addition, the wellhead will be clearly labeled with its unique designation. A diagram of the typical monitoring well construction is shown in **Figure 3**.

3.3 MONITORING WELL DEVELOPMENT

The monitoring wells will be developed following installation using one or more of the commonly used methods cited in the OEPA's *Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring*, dated February 1995. Potential methods include pumping, surging, bailing, air lifting, and air surging. Each well will be developed to a point that will allow representative formation water to enter the well. In general, a representative condition is assumed when the water is visually clear of sediments and temperature and conductivity, and pH have stabilized to within 10 percent over three successive well volumes.

In some instances, well development to provide a sediment-free sample is difficult or unattainable. If a well cannot be readily developed to provide a sediment-free sample, the development will stop after:

- A minimum of 10 well volumes have been removed
- Proper well construction has been verified
- Temperature, conductivity, and pH have stabilized to within 10 percent over at least three successive well volumes

3.4 MONITORING WELL SURVEY

In order to maintain consistent groundwater elevation data, all monitoring wells will be surveyed by a licensed Ohio surveyor for ground surface, top of PVC casing, and northing and easting

coordinates and tied into a site datum. The elevation of the site datum will be identified in reference to mean sea level. The PVC casing will be marked where all taped readings are to be obtained. Elevations at the marked locations will be recorded to the nearest 0.01-foot.

3.5 TEMPORARY MONITORING WELL ABANDONMENT

Temporary monitoring wells in the Pond 10 alignment (GP-1, 2, 5, 6, and B10-9) will be abandoned as deemed necessary during construction of Pond 10 and will be replaced by the permanent monitoring wells. The other temporary monitoring wells (GP-3, 4, 7, 8, 9, 10, 11, and 12) will remain in operation until further development of the site warrants their removal and replacement with permanent monitoring wells.

Abandonment will consist of removing the protective casing and the PVC casing from the well either by physically pulling the wells from the ground, or by overdrilling the well with hollow stem augers. The remaining hole will be grouted from the bottom up with a cement/bentonite grout mixture. A closure report describing these activities will be submitted to the OEPA, and copies will be kept by JM Stuart Station with other groundwater monitoring well-related data.

LITTLE THREE MILE CREEK

EXISTING POWER LINES

GP-1

B10-5

B10-4

MW10-2

MW10-3

B10-6

PROPOSED ASPHALT ROAD - NOT PART OF THIS CONTRACT

MW10-1

B10-3

B10-11

B10-2

GP-2

B10-10

B10-9

MW10-4

B10-17

PROPOSED TOP OF DIKE

B10-14

GP-5

PROPOSED POND 10

EXISTING ASPHALT ROAD TO BE REMOVED

EXISTING 16"ø WATER LINE TO BE REMOVED

MW10-5

B10-13

B10-8

EX. 16" W.M.

PARKING LOT

B10-16

B10-12

B10-7

EX. 16" W.M.

EXISTING MAINTENANCE YARD

MW10-6

B10-15

EXISTING MAINTENANCE BLDG

PROPOSED OIL ACCESS ROAD

MW10-7

B10-18

GP-6

EXISTING POND 8W

EXISTING COAL PILE

LEGEND

- SOIL BORING FUTURE ASH POND #10
- SOIL BORING COMPLETED AS GROUNDWATER MONITORING LOCATION
- DEEP SOIL BORING
- GEOPROBE GROUNDWATER MONITORING LOCATION
- PROPOSED PERMANENT MONITORING WELL

HORIZONTAL SCALE

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INDUSTRIAL WASTE DISPOSAL APPROVED

(NO PERMANENT INSTALLATION/CHANGE AS EVIDENCED BY COPY OF LETTER OF APPROVAL HERETO ATTACHED)

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PROPOSED PERMANENT WELL LOCATIONS

POND 10 DESIGN
DP&L – JM STUART
ABERDEEN, OHIO

WRS Grainer Woodward Clyde

2

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J.M. STUART FACILITY
MONITORING POINTS SURVEY ON POND 10 DAM

ORIGINAL MONUMENT DATA

POINT #	NORTHING			EASTING			ELEVATION		
P101-1	235352.469			1631076.176			568.240		
P101-2	235467.467			1630510.230			567.640		
P101-3	235444.168			1629910.462			567.920		
P101-4	235419.932			1629312.087			568.160		
P101-5	234973.139			1629043.006			567.620		
P101-6	234526.279			1629444.608			567.260		

AS SURVEYED ON 10-08-09

POINT #	NORTHING	Δ NORTHING		EASTING	Δ EASTING		ELEVATION	Δ ELEVATION	
		ORIG	PREV		ORIG	PREV		ORIG	PREV
P101-1	235352.480	0.011		1631076.220	0.044		568.110	-0.130	
P101-2	235467.490	0.023		1630510.230	0.000		567.490	-0.150	
P101-3	235444.230	0.062		1629910.510	0.048		567.910	-0.010	
P101-4	235419.960	0.028		1629312.150	0.063		568.110	-0.050	
P101-5	234973.230	0.091		1629043.030	0.024		567.640	0.020	
P101-6	234526.250	-0.029		1629444.560	-0.048		567.250	-0.010	

AS SURVEYED ON 09-18-12

POINT #	NORTHING	Δ NORTHING		EASTING	Δ EASTING		ELEVATION	Δ ELEVATION	
		ORIG	PREV		ORIG	PREV		ORIG	PREV
P101-1	235352.575	0.106	0.095	1631076.179	0.003	-0.041	568.168	-0.072	0.058
P101-2	235467.556	0.089	0.066	1630510.230	0.000	0.000	567.569	-0.071	0.079
P101-3	235444.287	0.119	0.057	1629910.502	0.040	-0.008	567.960	0.040	0.050
P101-4	235420.019	0.087	0.059	1629312.094	0.007	-0.056	568.244	0.084	0.134
P101-5	234973.304	0.165	0.074	1629042.989	-0.017	-0.041	567.697	0.077	0.057
P101-6	234526.318	0.039	0.068	1629444.595	-0.013	0.035	567.267	0.007	0.017

AS SURVEYED ON 6/11/2013

POINT #	NORTHING	Δ NORTHING		EASTING	Δ EASTING		ELEVATION	Δ ELEVATION	
		ORIG	PREV		ORIG	PREV		ORIG	PREV
P101-1	235352.543	0.074	-0.032	1631076.171	-0.005	-0.008	568.146	-0.094	-0.022
P101-2	235467.573	0.106	0.017	1630510.221	-0.009	-0.009	567.600	-0.040	0.031
P101-3	235444.305	0.137	0.018	1629910.504	0.042	0.002	567.946	0.026	-0.014
P101-4	235420.017	0.085	-0.002	1629312.124	0.037	0.030	568.220	0.060	-0.024
P101-5	234973.325	0.186	0.021	1629043.010	0.004	0.021	567.661	0.041	-0.036
P101-6	234526.341	0.062	0.023	1629444.581	-0.027	-0.014	567.294	0.034	0.027

Survey results show no significant movements is settlement monuments

APPENDIX 7.1
Excerpt from:
Assessment of Dam Safety Coal Combustion Surface Impoundments (Task 3)
Final Report
By CHA, Dated 26 March 2010
Pages 8, 9, 30, 31

entering another concrete drop inlet sluiceway and final discharge to the Ohio River. Based upon Section N shown on Ebasco Services, Inc. Drawing No. 300-46-1105 9 (Figure 6C), this drop inlet sluiceway is set at about El. 527, the maximum and operating pool level in Pond 7A.

1.3.4 Pond 10

Pond 10, the newest of the disposal basins at the J.M. Stuart facility, comprises a dike 23 feet in height, 15 feet wide at the crest, and approximately 3,700 feet in length (Figure 7A). It has a downstream blanket drain and is constructed against the west dike of an older impoundment, Pond 8 that has since been converted into a dry ash landfill facility. Pond 10 is partially incised, with the basin floor varying from El. 528 to El. 524, placing it about 20 to 25 feet below the original ground surface which varied from approximately El. 545 to El. 555 in the pond area.. It comprises two separate dike structures, with the north, west, and southwest sides being one structure constructed out of bottom ash, and the east side being the dike for the Ash Pond 8 impoundment. Available plans indicate that the dikes were constructed with 2.5H to 1V side slopes and have a crest elevation at 568. These plans also depict a compacted clay liner on the basin floor and along the incised portion of the basin walls. This liner extends to the top of the inboard or upstream slope of the newer dike structure forming the north, west, and southwest sides of the basin and is terminated just above the elevation of the downstream drainage blanket of the older dike structure. Figure 7B presents the typical dike cross sections for Pond 10.

The outlet structure for Pond 10 is an 8.5-foot by 8.5-foot reinforced concrete riser approximately 24 feet in height, bearing at El. 544 on a 2-foot thick, 10-foot by 10-foot concrete mat. It accommodates a 30-inch diameter HDPE outlet pipe with an invert elevation at 545 and is configured with a 3-foot wide vertical opening that accepts concrete stoplogs to control the ash level in the pond as the water level rises above El 544. A knife gate located on the interior of the concrete riser controls the flow to the outlet pipe and can shut off flow from the pond as the need arises. It should be noted that the outlet tower cannot completely empty the pond due to the fact that the basin bottom is up to 20 feet below the base of the outlet riser. The maximum pond

operating elevation is 565, allowing for 3-feet of freeboard between the water surface and the dike crest. Figure 7C presents the plan, elevation, and section views of this outlet structure.

1.3.5 Other Impoundments

Other impoundments at the JM Stuart Station include a wastewater and acid washdown basin adjacent to the treatment facility next to Pond 5 and an incised stormwater basin adjacent to Landfill No. 9. These basins do not store or process sluiced coal combustion waste.

1.4 Previously Identified Safety Issues

Based on our review of the information provided to CHA and as reported by DP&L there have been no identified safety issues related to dike stability or excessive seepage at Ash Pond 10. A safety inspection program has not been in place for Ponds 3A, 5, 6, and 7/7A.

1.5 Site Geology

Based on a review of available surficial geology map (Geologic map of the Maysville East quadrangle, Ohio-Kentucky, USGS GQ-1006, 1972), the predominate soil type at the site is likely to consist of glacial outwash deposits of sand, gravel, silt and clay. The surficial geology map is shown on Figure 8. Adjacent to the Ohio River and Little Threemile River, alluvial deposits of silt, sand, and clay are indicated. The bedrock geology map (Bedrock geology of the Maysville East, KY-Ohio Quadrangle, Ohio Division of Geological Survey, Open-File Map) indicates that Ordovician aged planar-bedded shale and limestone of the Kope Formation likely lies below these materials

used as an access road when the pond is active. Presently, inactive sluice pipe segments are stored on the dike crest area abutting Landfill 11. This area also retained standing water from landfill runoff at intermittent locations where landfill and facility operations traffic have worn the surface. This appears to be a maintenance and grading related issue and should be addressed when dredging activities resume or the pond is placed back into service.

Downstream or downstream slope areas were typically maintained and mowed and the grass cover was generally consistent, competent, and intact with few readily observable areas of cover loss or erosion as indicated in Photos 28, 33, 37, and 38. Other features observed on the downstream slopes include riprap lined drainage ditches and toe drains on the north and northwest portions of the pond dike. These areas were well maintained and generally free of excess vegetation, except at the grass slope/ditch line interface where mowing equipment cannot function and some weeds have begun to grow (Photo 29). During the site visit, some of these drain outlets conveyed a sparse amount of water, which is believed to be rainwater that infiltrated through the slope, given the current inactive status of the basin (Photo 30).

There is intermittent grass and weedy vegetation covering the upstream slopes of the pond (Photos 26, 27, 32, and 36), particularly below the previous operating water levels when the pond was active or ash has been recently removed. Intermittent erosion rills were also noted in the exposed soil on the upstream slope or locations where sheet flow became concentrated.

2.3.2 Pond 10 Outlet Structures

The Pond 10 outlet structure is located near the southeast corner of the pond. It is a rectangular concrete riser configured to accept stop logs to control the operating pool level when the pond is in operation. The riser foundation is several feet above the bottom elevation of Pond 10 placing the invert elevation at a level where the pond cannot be completely emptied through the outlet riser. No water was observed in the structure as the water level was far below the structure at the

time of the site assessment (Photo 33). According to facility personnel, water presently has to be pumped up to the riser to dewater the basin and continue dredging activities.

2.4 Visual Observations – Pond 3A

CHA performed visual observations of the Pond 3A embankment and outlet structures. Selected pictures are shown in Photos 39 through 52.

2.4.1 Pond 3A - Embankments and Crest

In general, the dikes of Pond 3A do not show signs of changes in their horizontal alignments from the proposed alignments. The west dike crest was measured to be approximately 18 feet wide, the south crest was measured to be approximately 13 feet wide, and the east crest was measured to be approximately 20 feet wide. The north dike (Photo 48) functions as a buttress for Landfill 11 and its crest supports one of the main access drives for waste material processing traffic at the facility. It is on the roughly 30 to 40 feet in width.

At the time of the site visit, the pond was inactive with very little standing water as shown in Photos 39, 45, and 49. The upstream slopes had varying amounts of vegetative cover, depending upon the extent to which recent dredging activities had occurred. On the south dike, vegetation was sparse to absent on the upstream slope because much of the ash had been removed (Photo 45). This is in contrast to the more prevalent vegetative cover on the north dike where the ash was largely undisturbed (Photo 42). At this location however, evidence of some past beaching erosion that occurred when the pond was active and full of water could be seen.

The downstream slopes were grass covered with occasional erosion rills (Photos 41 and 47) and some rutting from mowing operations. There is an area approximately 140 feet long on the west dike that is over steepened (Photo 40). This appears to be the result of operational activities making space for the presently inactive sluice line positioned at the toe of the western dike. This

APPENDIX 7.2
Dam Inventory Sheet from:
Dam Safety Inspection Report – J.M. Stuart Station Ash Pond 10
By Ohio Department of Natural Resources, Dated 12 June 2008

Dam Inventory Sheet

Name: JM STUART STATION ASH POND NO. 10 DAM
File No: 8535-011
National #: OH03030
Reservoir:
Permit No.: 00-291
Class (Ht-Vol): II (IV - II)

Owner Information

Owner: Dayton Power & Light Company
Owner Type: Utility
Address: US Route 52, POB 468
Multi-Dams: Yes: 8, Class I:1
Parcel No.:
City: Aberdeen **State:** OH **Zip:** 45101
Contact: Craig Spangler **Phone No.:** 937/549-2641

Location Information

County: Adams **Latitude Deg.:** 38 **Min.:** 38 **Sec.:** 22
Township: Sprigg **Longitude Deg.:** 83 **Min.:** 41 **Sec.:** 6
Stream: Unnamed Tributary To Three Mile Creek
Nearest Affected Community: Maysville, Ky
Community's Distance from Dam (miles): 3.2
USGS Quad.: Maysville East, Ky-oh **USGS Basin No.:** 05090201

Design/Construction Information

Designed By: Urs Corp
Constructed By: Waterland Trucking Service Inc
Completed: 2001 **Plan Available:** YES **At:** ODNR - DOW
Failure/Incident/Breach:

Structure Information

Purpose: Waste Retention
Type of Impound.: Upground
Type of Structure: Earthfill, Zoned
Drainage Area (sq. miles): 0.05 **or (acres):** 29.1

Embankment Data

Length (ft): 3700 **Upstream Slope:** 2.5H:1V
Height (ft): 24 **Downstream Slope:** 2.5H:1V
Top Width (ft): 15 **Volume of Fill (cub. yds.):**

Spillway Outlet Works Data

Lake Drain: GATE IN RISER
Principal: 10-FT X 10-FT CONCRETE RISER W/30-INCH-DIAMETER HDPE PIPE
Emergency: NONE
Maximum Spillway Discharge (cfs): 43 **Design Flood:** 0.50 **Flood Capacity:** 1.0

Dam Reservoir Data

	Elevation (ft-MSL)*	Area (acres)	Storage (acre-feet)
Top of Dam:	568	29.1	930
Emergency Spillway:			
Principal Spillway:	545.1	26.5	880
Streambed:	544		
Foundation:			

*Elevations are not necessarily related to a USGS benchmark

Inspection Information

Inspection History:
6/27/2013 JRH
6/12/2008 RAA
1/22/2002 TML

Phase I:
Other Visits:
Inspection Year: A

ZJMS

Operation Information/Remarks

Emergency Action Plan: Not Approved **Format:** ICODS **OMI:** Yes-on file
Last Entry: 4/15/2014

APPENDIX 8.1
Excerpt from:
Operation Maintenance and Inspection Manual Ash Impoundment Dike Stuart Electric Generating Station
By DP&L, Dated October 2012
Pages 1, 2, 7-11, Appendix C

OPERATION MAINTENANCE AND INSPECTION MANUAL

ASH IMPOUNDMENT DIKE

STUART ELECTRIC GENERATING STATION

ODNR FILE No.

POND 3A	POND 5	POND 6	POND 7	POND 10
8535-012	8535-003	8535-013	8535-002	8535-011

SPRIGG TOWNSHIP, ADAMS COUNTY
CLASS 2

OWNER:
DAYTON POWER & LIGHT COMPANY
745 U.S. ROUTE 52
MANCHESTER, OH 45144

(937) 549-2641 TEL
(937) 549-4281 FAX

PREPARED BY:

The Dayton Power & Light Company

Revised
April 8, 2014

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Figure 1.1 Location Map

Figure 1.2 Facility Map

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Appendix C **Inspection Forms**

Form 1 Rainfall Monitoring

Form 2 Monthly & Biannual Monitoring

Form 3 Dam Maintenance Record

Master document located in:

G:\Central Services\Equipment - System Owners\Ponds-Landfills\Stuart\OM&I Manual Stuart RA.doc

1.0 DESCRIPTION OF FACILITY

1.1 LOCATION

DP&L has 5 impoundments located at the J.M. Stuart Station in Sprigg Township, Adams County, Ohio as shown on Figure 1.1, Location Map and Figure 1.2, Facility Map. The purpose of this manual is to increase the safety of the impoundments by defining the procedures for operating, maintaining and inspecting the dams on a regular basis. The facility's characteristics are shown in Section 1.2's tables. The Operation, Maintenance & Inspection Manual (OM&I Manual) was prepared as required by OAC 1501:21-15-06.

Figure 1.1, Location Map

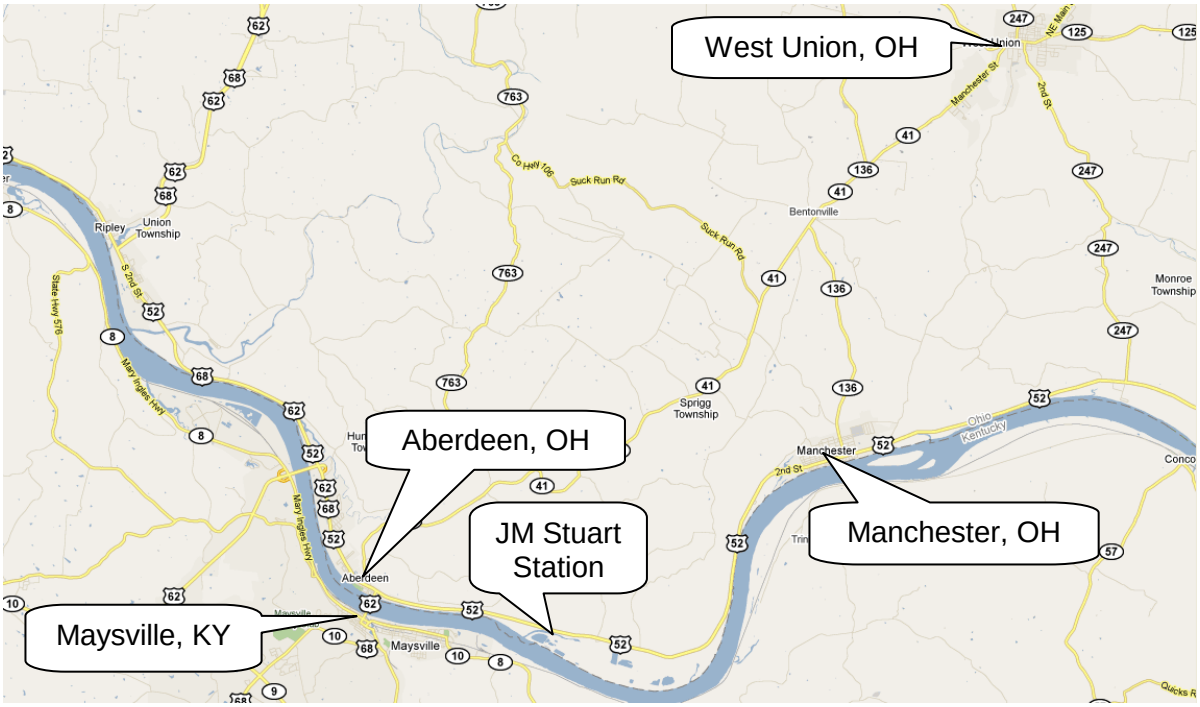
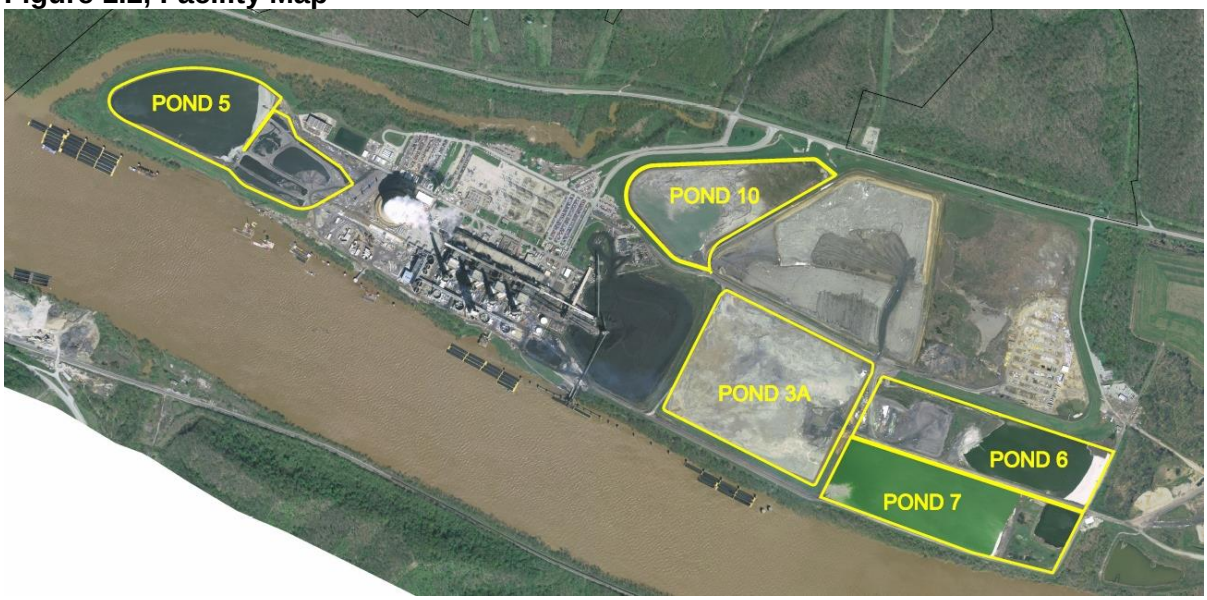


Figure 1.2, Facility Map



1.2 GENERAL ARRANGEMENT

Ponds 3A, 7 and 10 are primary fly ash settling ponds. They receive ash sluiced from the fly ash collection system from the plant. Pond 6 receives water from plant sumps and ash sluice water from the above mentioned ponds. Under normal operation only one of the three ash sluice ponds will discharge water at any given time. Pond 5 is divided into two sections. The east section contains primary settling lagoons for bottom ash and other plant area drainage sumps.

In 2012 a survey of the crest of the ponds was performed. The elevations in this document have been revised to reflect these elevations which are now referenced to the NAVD 1983.

1.2.1 Ash Pond 3A – ODNR File No. 8535-012

Ash pond 3A is an upland reservoir that was constructed in c1978 under ODNR Permit No. 77-97. A portion of this pond is constructed over the previously closed and abandoned Pond 3 which was capped with 2' of cohesive material. In 2010-11 a new liner was installed in the bottom consisting of 2 ft of 10^{-7} clay. The dam is constructed with a solid clay core. This pond is used for settling wet sluiced fly ash produced from the combustion of coal in the station generating units. The pond has an area of 52.7 acres at the crest, is 26 ft deep and has a volume of 1,257 acre-ft (427 million gal.) to the crest. This pond is periodically drained and the settled fly ash excavated which is then sent to a dry ash landfill.

A sand curtain drain was installed along the toe of the south dam to alleviate water in the pond 3 below this structure as indicated in drawing 300-46-1109.

The inlets for this pond are 5 HDPE pipes entering the pond typically in the southwest corner. Sluice lines are moved as the pond fills with solids. The Maximum Operating Level of this pond is 3 ft below the crest. The outlet is a concrete structure with removable stop logs to control the level and facilitate dewatering the pond for cleaning. Effluent is conveyed from this structure to pond 6 through a 30" reinforced concrete pipe.

During the normal excavation process the dam on the east side is breeched to facilitate ash hauling. Repair of the breech at the end of the excavation cycle shall be monitored and by a qualified technician under the supervision of a Professional Engineer.

Table 1.1 – Pond 3A Properties

Item	Description
IDENTIFICATION	
ODNR File Number	8535-012 / 77-97
LOCATION	
State	Ohio
County	Adams
Township	Sprigg
Stream	Ohio River
USGS Quadrangle Map	Maysville east, KY-Ohio
Community Distance from Dam	4 miles, Aberdeen, Ohio / Maysville, KY
DESIGN/CONSTRUCTION INFORMATION	
Original Designer	Bowser Mourner
Date Completed	1978
Contractor	Ucon Construction Co.
Purpose of Dam	Industrial
Type of Impoundment	Up ground
Type of Structure	Earth fill

1.2.5 Ash Pond 10 – ODNR File No. 8535-011

Ash pond 10 is a partially incised upland reservoir that was constructed in 2001 under ODNR Permit No. 00-291. This pond is used for settling wet sluiced fly ash produced from the combustion of coal in the station generating units. The pond has an area of 28.9 acres at the crest, is 40 ft deep and has a volume of 826 acre-ft to the crest. This pond is periodically drained and the settled fly ash excavated which is then sent to a dry ash landfill. The Maximum Operating Level of this pond is 3 ft below the crest. The outlet is a concrete structure with removable stop logs to control the level.

Table 1.2 – Pond 10 Properties

Item	Description
IDENTIFICATION	
ODNR File Number	8835-011
LOCATION	
State	Ohio
County	Adams
Township	Sprigg
Stream	Ohio River
USGS Quadrangle Map	Maysville east, KY-Ohio
Community Distance from Dam	4 miles, Aberdeen, Ohio / Maysville, KY
DESIGN/CONSTRUCTION INFORMATION	
Original Designer	URS Corp.
Date Completed	2005
Contractor	VFL/Headwaters
Purpose of Dam	Industrial
Type of Impoundment	Up ground
Type of Structure	Earth fill
Area at Crest	28.9 acres
Entire Length of Dam	3,470 ft
Bottom of Pond [1, 2]	El 523.5 ft.
Maximum Height	22 ft
Top Berm Width	10.0 ft
Maximum Operating Level	565.00 ft
Top of Dam	El 568.00 ft
Freeboard	3.0 ft
Upstream Slope [1, 2]	2.5H:1V
Downstream Slope [1, 2]	2.5H:1V
INLETS	
Fly Ash	Starting in the north end HDPE pipes are moved as needed to manage filling of the pond.
OUTLETS	
Outlet structure	Southwest corner, Latitude = 38° 38’ 16.46” N; Longitude = 83° 41’ 9.07” W Concrete structure with stop logs to adjust water level discharging through a 36” HDPE into Pond 6
Emergency Spillway	None.

2.0 OPERATION

Specific procedures for operation of mechanical equipment are as follows:

Table 2.1		
Frequency (Min.)	**Personnel**	**Maintenance Item**
Continuously	Owner's Representative	Monitor water levels and operation of filter system
		Monitor water levels
Semiannually	Owner's Representative	Exercise pond 6 weir gates to ensure operability.
		Exercise pond 10 sluice gate. Sluice gate shall otherwise be locked in the open position.

3.0 MAINTENANCE

Table 3.1 lists the type and frequency of the maintenance activities to be performed at the dam.

Table 3.1		
Frequency (Min.)	**Personnel**	**Maintenance Item**
Semi Annually	Owner's Representative	All broadleaf vegetation on the dam shall be sprayed with a broadleaf herbicide or cut and treated to prevent re-growth. This includes trees, shrubs and all other woody plants.
		Lubricate and inspect pond 6 weir gates.
		Lubricate and test operate Pond 10 discharge vlave
As Needed	Owner's Representative	• Repair erosion and re-establish proper vegetative cover. Reseeding of bare or eroded areas should be performed immediately to allow re-vegetation. The seed mixture shall meet the species requirement of ODOT 659.09 class 2 or class 3B. All alternates must be approved by ODNR. • Mow the grass to maintain a height of less than 12". • Make repairs to all structures and elements as required. • All rodent damage shall be repaired immediately by filling the burrows or holes utilizing the mud packing method. (*To backfill a burrow, place a length of metal stove pipe or PVC in a vertical position over the entrance to the burrow and fill with slurry clay and cement. After the burrow is filled, the pipe should be removed and dry earth tamped into the burrow entrance and the vegetation re-established.)* • Maintain a permanent record of all maintenance actions. Maintenance records may be maintained on Form 3 or maintained in an electronic maintenance management system.

3.1 SAFE DRAWDOWN RATE PLAN

The following section includes the method to be used for drawing the impoundment down under emergency conditions. Drawdown should be limited to 12" per week for normal operation and 6" per day for emergencies. Excessive drawdown can cause sloughing or slides of the upstream face of the dam.

For 3A and 10 the level should be lowered by removing stop logs to maintain the safe drawdown rate. Once the bottom of the outlet structure is reached, portable pumps shall be used to lower the level further. The water level in pond 7 must be lowered with portable pumps. Ponds 5 and 6 are critical to plant operation and cannot be lowered beyond the normal operating range without shutting the plant down. If an emergency necessitates that this be done the ponds will have to be drained with portable pumps. When possible pumps used for drawdown should be discharged into other ponds or the pond normal outfall.

4.0 INSPECTION

DP&L shall perform three types of inspections. Two periodic inspections include monthly and biannual. The third type is monitoring as needed during and after heavy rainfall events. Table 3.1 lists the type and frequency of the inspection activities to be performed at the dam. Inspection forms are included under Appendix A. DP&L's operations representative or operations contractor may complete the monthly inspections. The biannual (every 6 months) inspections should be completed by a person qualified Dam Safety and may be performed

by DP&L personnel or a Registered Professional Engineer. Inspections shall be documented on the forms provided with this manual.

Table 4.1

Frequency	Personnel	Inspection Item	Form No. or Reference
As Needed (After heavy rainfall event such as 2" in a 24 hour period)	Owner's Representative (Operations Shift Supervisor)	Monitor the rainfall at NOAA, National Weather Service or KYmesonet weather station in Mason County,	Form No. 1 www.nws.noaa.gov www.kymesonet.org
		Flow though overflow pipe	
		Water level of the impoundment	
Monthly *(Visual Observation)*	Owner's Representative (Plant Operations)	Seepage and/or wet areas	Form No. 2
		Flow through spillway or outlet pipe	
		Water level of the impoundment	
		Slides and cracks	
		Rodent activity along the waterline	
		Vandalism	
Biannually *(Visual Observation)*	Owner's Representative or consultant PE or other qualification. (Central Services)	Slope protection	Form No. 2
		Condition of earthen dam	
		Outfall discharge to plunge pool area	
		Condition of vertical riser and culvert *(visual)*	
		Pond drain and valve *(operational)*	
		Review dam maintenance records	
Periodic 5 years *(Visual Observation)*	ODNR/Division of Soil & Water Resources/Dam Safety Engineering Program	Engineer's Safety Inspection Checklist	Form provided by ODNR

5.0 RESPONSIBILITIES

Plant Manager

The Plant Manager is responsible for implementation of this manual. The Plant Manager or designee shall also be responsible for the annual review and revision of this manual.

Plant Commodities Manager

The Plant Commodities Manager or designee is responsible for the maintenance of the facility and record keeping of all maintenance activities.

Material Handling Shift Supervisor

The Shift Supervisors are responsible for the routine monthly inspections included those after a significant rainfall and monthly and adherence to operational practices. Supervisors are also responsible for periodic operation of drain valves. The shift supervisor may designate others to perform these suties

Central Services Engineer

The Central Services Engineer is responsible for conducting the semi-annual inspections and coordinating with ODNR for compliance of deficiencies and 5-year inspections.

6.0 APPENDICIES

APPENDIX A

Reference Drawings used in this manual.

APPENDIX B

Future Arrangement Drawings

APPENDIX C

Inspection forms.

APPENDIX C

INSPECTION FORMS

FORM 1

RAINFALL MONITORING

This form should record all inspections triggered by significant rainfall events (greater than 2” in a 24 hour period) in the area. The National Weather Service (NOAA) web site is useful for monitoring these events. Note any significant decrease of freeboard or obstructions to flow in the outlet structures.

POST RAINFALL EVENT MONITORING FORM				
DATE (M/D/Y)	PERSONNEL NAME	RAINFALL (in)	ESTIMATED FREEBOARD (ft)	COMMENTS

FORM 2

Stuart Station Pond _____
Dam Inspection Report
ODNR File No. _____

MONTHLY/SEMIANNUAL INSPECTION FORM

Where appropriate, indicate conditions below as "**none**" or "**acceptable**" if no further action is required. Check "**repair**", "**monitor**", or "**investigate**" if further action is required. Obvious problems will require repair. Monitoring will be recommended if there is potential for a problem to occur in the future. Investigation is necessary if the reason that the problem is occurring is not obvious. More than one box may be checked if necessary. The locations of any observed conditions can be noted on photographs.

CONDITIONS AT THE TIME OF INSPECTION			
DATE		INSPECTED BY:	

AREA	ITEM	OBSERVATIONS	ACTION		
			REPAIR	MONITOR	INVESTIGATE
DAM EMBANKMENT					
BOTTOM ASH UPSTREAM SLOPE	VEGETATION/TREES/ BRUSH				
	RODENT BURROWS				
	RIPRAP				
	BREACHING/SLIDES/ CRACKS				
	UNDERMINING/ EROSION				
	OTHER				
FLY ASH UPSTREAM SLOPE	VEGETATION/TREES/ BRUSH				
	RODENT BURROWS				
	RIPRAP				
	BREACHING/SLIDES/ CRACKS				
	UNDERMINING/ EROSION				
	OTHER				
CREST	RUTS/EROSION				
	CRACKS/ SETTLEMENT				
	OTHER				

DOWNSTREAM SLOPE	VEGETATION/TREES/ BRUSH				
	RODENT BURROWS				
	SLOUGHS/SLIDES/ CRACKS				
	SEEPAGE/WETNESS				
	OTHER				
TOE	CRACKS/SLUMPS				
	SEEPAGE/WETNESS				
	OTHER				
INFLUENT/EFFLUENT STRUCTURES					
INLET STRUCTURE	OBSTRUCTIONS				
	DETERIORIATION				
	ACCESS/GRATING				
	OTHER				
OUTLET STRUCTURE	OBSTRUCTIONS				
	DETERIORIATION/ SEEPAGE				
	UNDERMINING				
	ACCESS/GRATING				
	OTHER				

FORM 3

Stuart Station Pond _____ **Dam Maintenance Report** **ODNR File No. _____**		
DAM MAINTENANCE RECORD FORM		
This form may be used to record all maintenance tasks performed including preventative maintenance, corrective maintenance and emergency maintenance.		
DATE	WORK ORDER NO.	ACTION

Alternate spreadsheet used in lieu of this form. A mowing log is kept separately.

APPENDIX 8.2
Excerpt from:
Assessment of Dam Safety Coal Combustion Surface Impoundment (Task 3) Final Report
By CHA, Dated 26 March 2010
Pages 106-110

above approximately 1 to 12 feet of fine grained, generally cohesive alluvial deposits comprising medium stiff to hard clay, silty clay and silt. Granular alluvial deposits comprising silty and clayey sand to poorly graded and well graded sand with gravel at lower elevations was evident below the cohesive soils. This granular deposit was divided into an upper and lower zone. Very loose to medium dense conditions were apparent in the upper zone noted to between 9 and 25 feet below grade, and loose to very dense conditions in the deeper, cleaner sand with gravel noted to more than 100 feet below grade. Under seismic load conditions, the very loose to loose sand and silty sand soils in evident in the upper zone closest to the dike foundation may be susceptible to liquefaction behavior during which they lose shear strength and flow like a viscous liquid. Additional discussion regarding liquefaction appears in Section 4 of this report.

A generalized cross section of Pond 10 and its associated dikes (Figure 13C) indicates that the dikes are founded above the cohesive alluvium and the basin bottom is in the upper granular alluvium comprising silty to clayey sand. Available specifications indicate that the dike foundation was to be "stripped to the depths required to remove vegetative matter, roots, and other perishable, loose, or objectionable material". This directive would likely address the topsoil and miscellaneous fill materials encountered in the surficial zone in the foundation area. Furthermore, the foundation soils were to be proof rolled to delineate soft or yielding subgrade. Any poor subgrade conditions exposed in the field was to be excavated and replaced with the appropriate compacted material for the foundation location.

3.5 Operations & Maintenance

DP&L provided CHA with a copy of the Operations, Maintenance, and Inspection Manual (OMI) and a copy of the Emergency Action Plan (EAP), both dated May 15, 2000. A copy of Addendum No.1 to the OMI dated December 20. 2001 was also included with the DP&L submittal. These items address Pond 10, the most recent impoundment commissioned at the site. Tasks required under the OMI are supposed to be performed by J.M. Stuart plant personnel and address the following:

- Operation of Reservoir – Discharge fly ash/water slurry into the pond at a location away from the outlet structure and allow ash to settle/decant. Add stop logs as ash levels rise to prevent ash flow through outlet structure.
    - Initial filling of Ash Pond 10
    - Installation of stop logs

- Dike Inspections – Outlines field inspection schedule and highlights critical items.
    - Inspection procedures and general inspection recommendations
    - Featured inspection items – Addendum No.1 adds discharge pipe, sand toe drain, and abutment areas with Pond 8W (now Landfill 11) dike to list
    - Repair Order/Work Performed Items

- Maintenance Items – Identifies appurtenant structures needed for effective operation and important dam safety concepts. A Dike Inspection Checklist along with a dike inspection plan and site operation schematic are included as a part of this OMI.
    - Concrete/Steel Structures and associated mechanisms
    - Skimmer, Walkway, and Safety Barriers
    - Crest and Access Roads
    - Vegetation and Rodent Control
    - Debris/Obstructions in Outlet Structure
    - Erosion
    - Seepage
    - Cracks/slides/slumps and gross deformations

- Emergency Procedures – Emergent or critical problems beyond routine maintenance. Separates them into two categories
    - Non-Failure or Potential Failure
    - Imminent or Failure has Occurred

Based upon conversations during our site visit, we understand that Plant personnel make visual observations on a daily basis during the course of their work on-site. However, a formal documented inspection procedure is not in place.

The Emergency Action Plan (EAP) for Pond 10 includes the following items:

- Communication Flow Charts for the type of emergency situation.
  - Non-Failure/Potential Failure – Flow Chart II
  - Failure Imminent/Failure Occurred – Flow Chart III
  - Flow Chart I is a general communication flow chart.

- Emergency Criteria to establish the level of deficiency and determine if a company or public notification is warranted.
  - Minor, Non-Emergency – Typically a maintenance issue
  - Serious Deficiency - Non-Failure/Potential Failure, requires immediate repair and company alert
  - Emergent Deficiency – Failure Imminent/Failure Occurred, requires public alert

- Personnel Responsibilities – Delegates specific responsibilities during an emergency situation
  - Notification Responsibility – critical communication with required personnel and agencies.
  - Evacuation Responsibility –if US 52 is threatened
  - Security, Follow-up, and Duration Responsibility
  - EAP Coordinator – EAP revision, training, etc.

In addition to the items listed above, the EAP for Pond 10 also included an inundation map showing the extent of an ash flow from the pond should a breach occur, site specific concerns associated with U.S. 52, and the EAP approval from the Adams County Emergency Action Agency.

3.6 Inspections

3.6.1 State Inspections

Ohio Revised Code Section 1521.062 states that the owners of dams must monitor, maintain, and operate their dams safely. The owner is to maintain a safe structure and appurtenances through inspection, maintenance, and operation. For Engineering Repairs and Investigations, the dam owner must retain the services of a professional engineer to address the plans, specification, investigative reports, and other supporting documentation. The owner is required to complete the items within five (5) years. Owner repairs may be performed by the dam owner or by a hired contractor.

Representatives of the ODNR Dam Safety Program inspected Ash Pond 10 structures on June 12, 2008 and their observations were summarized in a Dam Safety Inspection Report. The report included required remedial measures based on observation made during the inspection, calculations performed, and requirements of the Ohio Administrative Code. The Dam Safety Inspection Report identified the following required remedial measures:

- Remove trees growing in the rip-rap at the toe of the northeast embankment.
- Establish a regular mowing routine to permit inspection of the upstream slope.
- Keep detailed records of quarterly inspections by site personnel using the checklists included in the Operations, Maintenance, & Inspection Manual.

Representatives of the ODNR Dam Safety Program accompanied CHA and site representatives during CHA's site assessment on October 27, 2009 and October 28, 2009. Subsequently, ODNR issued a letter to DP&L on November 5, 2009 indicating that a Professional Engineer must be engaged to investigate observed seepage and corresponding stability of the dike at Ash Pond 5. ODNR indicated that the investigation must be completed within six months of the date of their letter.

3.6.2 Inspections by Engineering Consultants

DP&L's letter to the USEPA responding to the request for information indicates that Civil & Environmental Consultants performed an assessment of Ash Ponds 3A, 5, 6, 7, 7A, and 10 in 2009 and that no significant issues were identified at the time of the inspection. CHA has not been provided with a copy of the inspection report.