MITCHELL LANDFILL
RUN-ON AND RUN-OFF CONTROL SYSTEM PLAN

Prepared for:

KENTUCKY POWER COMPANY
d/b/a AMERICAN ELECTRIC POWER SERVICE CORPORATION
1 Riverside Plaza
Columbus, Ohio 43215

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
5899 Montclair Blvd
Cincinnati, OH 45150
(513) 985-0226

CEC Project 162-507

INITIAL PLAN PREPARED:
October 2016

GEVR-16-044

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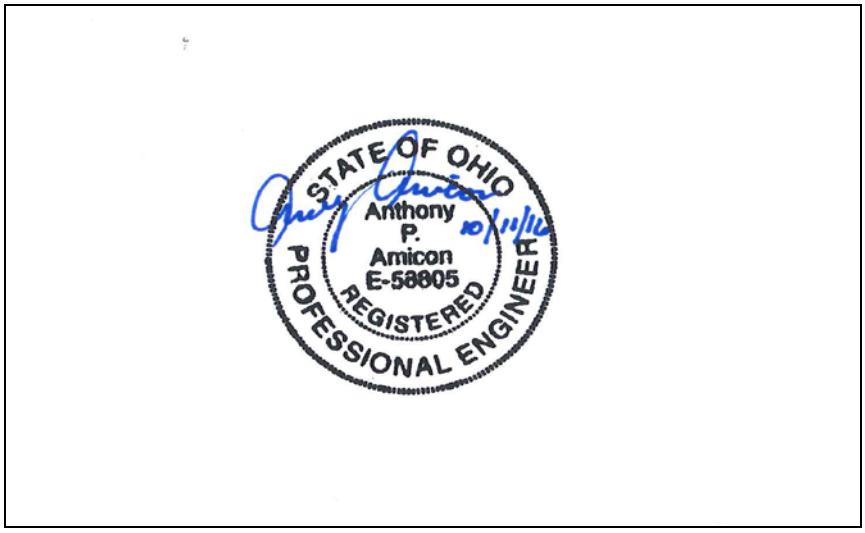
ENGINEER'S VERIFICATION STATEMENT

I hereby verify that the contents of this Run-On and Run-Off Control System Plan for the Mitchell Landfill owned by the Kentucky Power Company doing business as (d/b/a) American Electric Power Service Corporation meets the requirements of Federal Regulations Title 40, Part 257.81.



Anthony P. Amicon, P.E. - Principal
Civil & Environmental Consultants, Inc.

1.0 INTRODUCTION

The Mitchell landfill (ML) is owned and operated by Kentucky Power Company, doing business as (d/b/a) American Electric Power Service Corporation (AEP). The landfill is located along Gatts Ridge Road (Marshall County Road 72), approximately 2 miles north of the intersection with County Road 74 (about 2 miles due east of the Mitchell Power Generation Plant) in Marshall County, West Virginia. The ML is regulated by the West Virginia Department of Environmental Protection (WVDEP) under Solid Waste Permit No. WV0116742, allowing construction and operation of the landfill.

Overall, ML has a maximum disposal capacity of about 10 million cubic yards for excess Coal Combustion Residuals (CCR) produced from the Mitchell Power Generating Plant that is not beneficially reused. The landfill boundary comprises about 169.6 acres with CCR being placed within a footprint of 57.6 acres. Construction of ML was initiated in 2013 and operation of the landfill began in May of 2014.

The United States Environmental Protection Agency (USEPA) recently established a Rule for CCR waste units, which has been published in the Federal Register and is an extension of the current Code Federal Rules (CFR) Title 40, Part 257 (Rule §257). In accordance with §257.81, the ML is required to prepare a Run-On and Run-Off Control System Plan (Plan) by October 17, 2016. The Plan is to be included with the facility's Operating Record as required by § 257.105(g)(3). As such, in order to comply with §257.81, AEP has contracted Civil & Environmental Consultants, Inc. (CEC) to prepare this Plan. This Plan addresses the following requirements of Rule §257.81:

- A run-on control system to prevent flow onto the active portion of the CCR Unit during the peak discharge from a 24-hour, 25-year storm; and,
- A run-off control system from the active portion of the CCR Unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm. Run-off from the active portion of the CCR Unit must be handled in accordance with the surface water requirements under §257.3-3.

Since the ML is an operating facility, this Plan describes the existing run-on and run-off control features as well as those planned as part of future phase construction. Generally, run-on control features address collection and conveyance features associated with non-contact stormwater (i.e., liquid not coming in contact with the waste). Run-off control features address collection, conveyance, and treatment features for contact stormwater (i.e., liquid coming in contact with the waste).

This Plan summarizes the run-on and run-off control features and provides supporting calculations and figures. Note that the supporting calculations and figures are similar to those submitted as part of the permit application process for the currently approved Solid Waste/National Pollutant Discharge Elimination System (NPDES) Permit from the WVDEP associated with the ML.

2.0 RUN-ON CONTROLS

2.1 RUN-ON CONTROL OUTSIDE THE LANDFILL FOOTPRINT

Run-on control outside of the landfill footprint generally consist of stormwater surface controls, which prevent stormwater falling outside of the landfill footprint from running onto the active portions of the landfill. These stormwater surface controls have been developed in accordance with the Design and Construction Requirements contained in the WVDEP Solid Waste Regulations and meet the requirement for the ML NPDES Permit.

These stormwater surface controls are constructed in phases associated with landfill development. The ML has been subdivided into numbered phases (Phases 1 through 5) reflecting the order in which each partial area of the landfill will be constructed and filled. ML is currently placing waste in Phase 2. As the landfill operations progress, a subsequent phase of the landfill is prepared and constructed. Sediment basin(s) and other associated surface water/erosion control structures (cover, diversion berms, channels, ditches, etc.) are then constructed as part of the phase development. A General Phasing Plan (Drawing No. 12-30110-13 in Appendix C) depicts an overview of the landfill sequencing. Drawing Nos. 12-30110-21 through 12-30110-26 in Appendix C provide detail regarding the individual phase development.

During operation of the landfill, regular maintenance and inspection of these structures is performed to ensure proper control of surface water and eroded sediments. Other standard operating procedures associated with control of surface water and eroded sediments are implemented on a regular as-needed basis and include:

- Construction of containment berms;
- Inspection of control structures;
- Maintenance and repair of channels and structures;
- Removal of accumulated sediment in sediment ponds;
- Placement of temporary and permanent protective cover and establishment of cover vegetation;

- Minimizing active fill areas within the phase;
- Installation and maintenance of silt fence and inlet protection; and,
- General best management practices as define in the Soil Erosion and Sediment Control Plan for the project.

A description of specific criteria used in the design of the stormwater surface controls, specifically stormwater channels, culverts, and sediment ponds, is included below.

2.1.1 Stormwater Channel and Culvert Design

Existing and/or future permanent drainage channels collect and convey non-contact water to three permanent and one temporary sediment ponds. The surface water channels are designed such that the stormwater volumes and peak flows were calculated using the "Soil-Cover Complex" methodology presented in Soil Conservation Service Technical Release No. 55 ("TR-55", SCS 1986). Site soils were classified as Hydrologic Soil Groups “B” and “C”, and all land covers were assumed to be in "good" condition. Since over 95% of the site consists of “C” type soils, type “C” soils curve numbers were used throughout the calculations. Times-of-concentration were computed using the "segmental" method in TR-55. Peak discharge factors were obtained from tables in TR-55.

The hydrologic design basis for surface water collection and conveyance structures is the 25-year, 24-hour storm. This design storm event is applicable to the site runoff collection channels and culverts. The Federal Highway Administration Hydraulic Engineering Circular No. 15 (HEC-15) was used as a guideline for channel linings and maximum velocities for drainage ditches. The 2-year, 24-hour; 10-year, 24-hour; 25-year, 24-hour; 50-year, 24-hour; 100-year, 24-hour storms were used to calculate the runoff detention volume, the flood storage volume, freeboard, and the emergency spillway discharge, respectively, for the South, West, North, and Temporary Sediment Ponds.

The rainfall intensities at the location of the ML applicable to the design of surface water structures were obtained from the United States Department of Commerce, Weather Bureau,

Technical Paper No. 40, Rainfall Frequency Atlas of the United States, for Marshall County, West Virginia. The historical rainfall distribution for each 2-hour storm is based on the Soil Conservation Service (SCS) Type II rainfall distribution. Antecedent Moisture Condition II - Normal was assumed for design.

Eighteen (18) existing or future culverts are associated with ML development. Riprap outlet protection is used to prevent erosion at each culvert. Refer to Drawing Nos. 12-30110-18, 12-30110-21 through 12-30110-28, 12-30110-40, 12-30110-41, 12-30110-44, and 12-30110-45 in Appendix C for the locations, sizes, and outlet protection specifics for the culverts.

Supporting calculations showing size and capacity for the channels and culverts using the above-described methodology (i.e., 24-hour, 25-years storm event) are presented in Appendix B of this Plan.

2.1.2 Sediment Pond Design

Three permanent (two existing and one future) and one temporary (constructed and removed) sediment ponds are associated with ML development. The primary sediment pond (South Pond) is located at the south end of the landfill and at the downstream end of the valley. The two other permanent sediment ponds (North and West Ponds) are located north and west of the landfill waste limits. A temporary sediment pond (Temporary Pond) was also located in the valley to control construction run-off prior to the South Pond development. These structures are used to collect stormwater and control sediment.

Current and future sediment ponds have been designed with outlet structures that control the discharge of stormwater through the basins. Each sediment control structure has sediment capacity of 0.125 acre-feet for each acre of disturbed area in the structures watershed. In addition to the sediment capacity, the sediment control structures have a detention capacity to store a two (2)-year, twenty-four (24)-hour frequency storm. The detained stormwater is then released through a non-clogging dewatering skimmer device that allows the stored volume of water to be evacuated within a seven (7)-day to eight (8)-day period.

The structures provide a combination of principal and emergency spillways that safely discharge the twenty-five (25)-year, twenty-four (24)-hour storm without overtopping of the structure. The structures are designed to ensure no outflow through the emergency spillway during the passage of a ten (10)-year, twenty-four (24)-hour frequency storm.

During the design storm, each structure provides a minimum difference in elevation of one (1) foot between the crest of the principal spillway and the crest of the emergency spillway. Additionally, a minimum difference in elevation of one (1) foot of freeboard is provided between the maximum design flow elevation in the emergency spillway and the top of the embankment.

Supporting calculations used to size the sediment ponds using the above-described methodology (i.e., 24-hour, 25-years storm event) are presented in Appendix B of this Plan. Refer to Drawings in Appendix C for the locations, design grades, and details associated with the Sediment Ponds and supporting structures.

2.2 RUN-ON CONTROL INSIDE THE LANDFILL FOOTPRINT

Active waste operations will continue at the ML until final design grades are reached. As waste placement reaches the planned exterior grades of the landfill throughout the planned operation of the facility, the waste will be covered with a protective cover system or cap constructed with the on-site soils. Details related to the cap are shown on Drawing No. 12-30110-48 in Appendix C and specifics for the cover soils are described below.

The permanent cover for the ML will consist of a 2-foot thick layer of compacted cohesive soil meeting a minimum permeability of 1×10^{-6} cm/sec. Selected natural soils and highly weathered bedrock will meet this criteria. The recompacted soils and bedrock samples tested achieved permeability values ranging between $1x10^{-5}$ cm/sec to $1x10^{-7}$ cm/sec (compacted to 95% of the Standard Proctor).

Lime, fertilizer and mulch will be provided as necessary to promote vegetative growth within the top 6 inches of the cover. The natural soil cover material will be generated from excavations required to achieve the landfill liner, sediment ponds, Leachate Storage Pond, and haul road grades.

Similar to the run-on control features, stormwater control features atop of the permanent cover (i.e., benches, downchutes, etc.) have a hydrologic design basis of the 25-year, 24-hour storm event. Refer to the supporting calculations in Appendix B of this Plan for design calculations associated with the run-on control features within the landfill footprint.

3.0 RUN-OFF CONTROLS

3.1 PERIMETER CONTAINMENT BERMS

Generally, the working surface of the active landfill remains relatively level with the active fill area being sloped towards the interior of the landfill, such that the successive waste fill lifts increase the elevation within the phase. This is accomplished by constructing a containment berm at the planned exterior limits of the interim or final slope of the phase followed by placement of successive waste fill lifts within the phase until the approximate top of the containment berm is reached. This process is continued by shifting the outside edge of each subsequent containment berm to create a maximum exterior slope of 3 horizontal to 1 vertical (3H:1V) until the design grade of the phase is reached. These containment berms serve the purpose to separate run-off (contact water) from flowing outside of the waste placement area.

The initial containment berm for waste placement, positioned at the toe of the first three phases in the valley bottom, has a minimum height of 10 feet, a crest width of 6 feet and side slopes of 3H:1V or flatter on the exterior side. The initial containment berm for Phase 4 will be increased to 15 feet in height. Subsequent containment berms have a maximum height of 5 feet and a crest width of 6 feet. The internal and external slopes have a minimum 2H:1V and 3H:1V, respectively.

3.2 LEACHATE COLLECTION SYSTEM

Contaminated runoff ("contact water") is collected as part of the leachate collection system and is conveyed to the Leachate Storage Pond via the vertical chimney drains, the leachate collection system, and associated lift station. The surface of the active fill area is sloped towards the interior of the landfill, graded to minimize ponding of water, and directs excess surface water to chimney drain locations.

The Hydrologic Evaluation of Landfill Performance (HELP) model was used to calculate the average daily leachate flow and the average annual leachate volume for the ML. The average

daily leachate flow for the ML, as estimated by the HELP model, is 560 gallons per acre per day for active landfill operation areas, and 180 gallons per acre per day after landfill closure.

The maximum average annual leachate volume will occur when a majority of the site is closed and a portion of the landfill remains active, and can be computed assuming the maximum area of the active phase is 15 acres with the remaining 42.6 acres of landfill area being closed. Using the above estimated daily leachate flows for active and closed conditions, the maximum average annual leachate volume for the entire 57.6-acre lined landfill area is expected to be 6,000,000 gallons per year. These volume estimates are based on steady-state flow conditions. Supporting calculations are contained in Appendix B of this Plan.

Note that the HELP Model calculations included in Appendix B include evaluations where the peak precipitation event is 4.44 inches, which corresponds to the 24-hour, 25-year storm event. Therefore, design aspects of ML which rely on the above described leachate generation estimates are designed for the 24-hour, 25-year storm event per §257.81. Drawing Nos. 12-30110-15 and 12-30110-16 in Appendix C identify the location of the leachate collection system.

3.3 LEACHATE CONVEYANCE FEATURES

The leachate collection system consists of three main components:

- Geocomposite Drainage Net (GDN) - comprised of an HDPE geonet with nonwoven, needle-punched geotextiles heat-bonded to its upper and lower surfaces. GDN covers the entire bottom of the landfill and collects and conveys leachate to pipe/aggregate envelopes located along the landfill side slopes and valley axes.
- Granular Drainage Material - constructed atop the GDN with a minimum thickness of 18-inches across the bottom of the landfill (within the main valley axis).
- Leachate collection system piping – to be comprised of perforated HDPE pipes, non-calcareous, free draining aggregate, and a nonwoven, needle-punched geotextile. The leachate collection system piping collects and conveys leachate out of the landfill via gravity flow and into a lift station for conveyance to the Leachate Storage Pond.

GDN was selected as the primary leachate collection/conveyance layer due to its reduced thickness (results in additional landfill airspace), ease of installation (as compared to an aggregate layer), and high hydraulic conductivity (minimizes development of leachate head atop the composite liner). The GDN also acts as a cushion layer to protect the PVC geomembrane from damage during protective cover placement. Coarse aggregate envelopes the leachate collection pipes to provide high hydraulic conductivity. A non-carbonate stone is used to prevent degradation of the collection envelope over time. HDPE pipe was specified to withstand the landfill loads while being compatible with the anticipated leachate. The leachate collection system piping was also designed with cleanouts to facilitate maintenance.

Leachate and contaminated stormwater (stormwater that has come in contact with waste) is collected by the leachate conveyance features and conveyed to a lift station. The lift station structure receives leachate via gravity flow from the landfill and transfers the leachate via a force main to the Leachate Storage Pond. The lift station structure is sealed and lined to prevent leakage and leachate pipes located outside of the landfill limits of waste are comprised of dual walled pipes. The capacity of the pump station is established based on the anticipated peak leachate flow rates from the leachate collection system and the operational efficiency requirements of the selected pump(s). The pump station structure is lined and the associated force main is comprised of a dual walled HDPE pipe. The pump station is equipped with an automated control system to operate the pumps, provide alerts to the operator and monitor the leachate volumes pumped to the storage pond. The emergency overflow for the lift station is directed to a pipe that bypasses the South Pond and discharges to an unnamed tributary to Fish Creek.

The location and design details for the lift station and Leachate Storage Pond are included on Drawing Nos. 12-30110-15, 12-30110-16, 12-30110-45, 12-30110-47, and 12-30110-50, and DR-4 in Appendix C.

3.4 LEACHATE STORAGE POND

A Leachate Storage Pond has been established as part of the initial landfill construction and will remain in service throughout the operational life of the landfill and during the post-closure period. The Leachate Storage Pond is located at the high point of the valley ridge west of the landfill such that the pond bottom is well above the seasonal high groundwater at the site. This pond has a composite liner comprised of a 4-feet thick geologic isolation layer, a 45-mil polypropylene geomembrane constructed atop a geosynthetic clay liner (GCL). The maximum holding capacity of the Leachate Storage Pond is 6.9 acre-feet (ac-ft.). The design holding capacity is sufficient to contain the anticipated leachate volume for a 30-day period, as required by the West Virginia Solid Waste Regulations. The 30-day storage capacity is calculated using the average annual leachate volume of 6,000,000 gallons per year adjusted to 30 days to get a required storage capacity of 500,000 gallons (1.5 ac-ft.). In addition, the storage pond has excess holding capacity (about 5.4 ac-ft.) to store contact runoff generated from heavy precipitation events. The additional holding capacity, in excess of the 30-day storage capacity, allows for storage of leachate that is generated from a 100-year 24-hour storm applied over 15 acres of active disposal area draining to the leachate collection system.

The Leachate Storage Pond pool elevation is monitored and managed on a regular basis by the landfill operator. Leachate is removed from the storage pond on an as needed basis to maintain sufficient storage capacity. The leachate removed from the pond is beneficially reused (dust suppression within the landfill, moisture conditioning of fly ash to facilitate compaction or moisture conditioning of fly ash at the storage silo) or treated at the wastewater treatment bottom ash pond complex at the Mitchell Plant. No overflow discharge will occur from the pond except on an emergency basis. Design details for the Leachate Storage Pond are included on Drawings DR-4 and DR-5 in Appendix C.

3.5 WASTE FILLING OPERATIONS

Generally, waste materials are spread and graded in 12-inch thick loose lifts. If necessary, the material is moisture conditioned to prior to compaction. Each lift is compacted using a smooth

drum vibratory roller to achieve an in-situ density of at least 95 percent of the maximum laboratory dry density as determined by ASTM D-698. The smooth drum roller has a minimum dynamic force of 500 pounds per linear inch and a static weight of 125 pounds per lineal inch. The compaction units shall travel at a speed not exceeding 2.5 miles per hour with a minimum of six passes. Each pass of the vibratory roller overlaps the adjacent pass. The compaction equipment, lift thickness and number of passes are subject to change based on verification that the in-place density of the waste is achieved using alternative methods. Within the distance of 8 feet from any structure, the use of the above-specified roller shall be discontinued and hand-operated compactors shall be used. In addition, the fly ash, bottom ash and gypsum is commingled in normal waste placement operational areas without any specified segregation.

To assure an environmentally sound operation, the ML site waste hauling procedures require the following:

- Trucks shall be tarped while traveling to and from the landfill;
- Trucks shall maintain posted speed limits; and
- Upon trucks leaving the landfill site on their return trip, the disposal contractor must make certain that the truck body and wheels are free of all ash and/or mud before entering roads. A truck washing facility may be established at the landfill site, if necessary, to safeguard against these conditions occurring.

4.0 PLAN REVIEW AND CHANGES IN FACILITY CONFIGURATION

In accordance with §257.81, this Run-On and Run-Off Control Plan shall be reviewed periodically, at a minimum of every 5 years. During such reviews, this Plan will be updated as needed to reflect the current design and operation of the ML. A Plan Review Log to record periodic Plan reviews and revisions is included in Appendix A.

APPENDIX A

PLAN REVIEW LOG

MITCHELL LANDFILL
RUN-ON, RUN-OFF CONTROL PLAN

PLAN REVIEW LOG

Action	Performed by:	Date
Prepare Initial Run-On, Run-Off Control Plan	CEC	10/11/2016

Note:

1. In accordance with §257.81, this Run-On and Run-Off Control Plan shall be reviewed periodically, at a minimum of every 5 years.

APPENDIX B

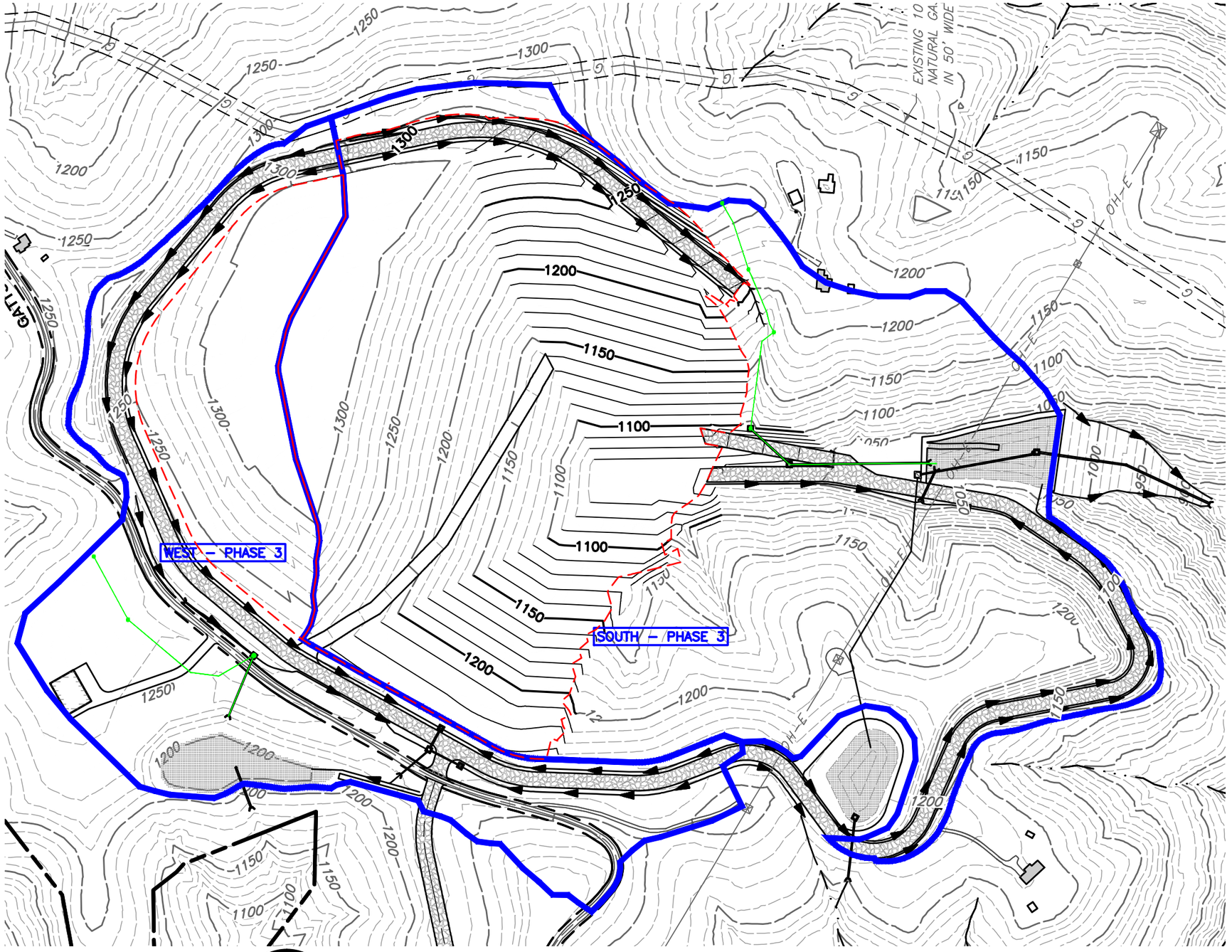
SUPPORTING CALULATIONS

LEGEND:

- Tc PATH
- DRAINAGE AREA
- DRAINAGE BERM/ CHANNEL
- DRAINAGE AREA NAME — DRAINAGE NAME
- EXISTING CONTOURS — 1000
- PROPOSED TOP OF LINER/FILL GRADING — 1000
- DISTURBED LIMITS

NOTES:

1. REFER TO HYDRAFLOW OUTPUT FOR DETAILED INFORMATION REGARDING TIME OF CONCENTRATIONS, FLOW LENGTHS AND CN NUMBERS.
2. POND SIZING AND DESIGN CAN BE FOUND IN THE CALCULATION ENTITLED "SEDIMENT POND DESIGN CALCULATIONS."



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Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
513-985-0226 · 800-759-5614
www.cecinc.com

American Electric Power
Mitchell Landfill
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Marshall County, West Virginia

PHASE 3 - DRAINAGE MAP

DRAWN BY:	MTF	CHECKED BY:	JDM	APPROVED BY:		FIGURE NO.:
DATE:	APRIL 3, 2012	DWG SCALE:	1"=300'	PROJECT NO:	110-416	D

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LEGEND:

Tc PATH

DRAINAGE AREA

DRAINAGE BERM/ CHANNEL

DRAINAGE AREA NAME — DRAINAGE NAME

EXISTING CONTOURS — 1000

PROPOSED TOP OF LINER/FILL GRADING — 1000

DISTURBED LIMITS

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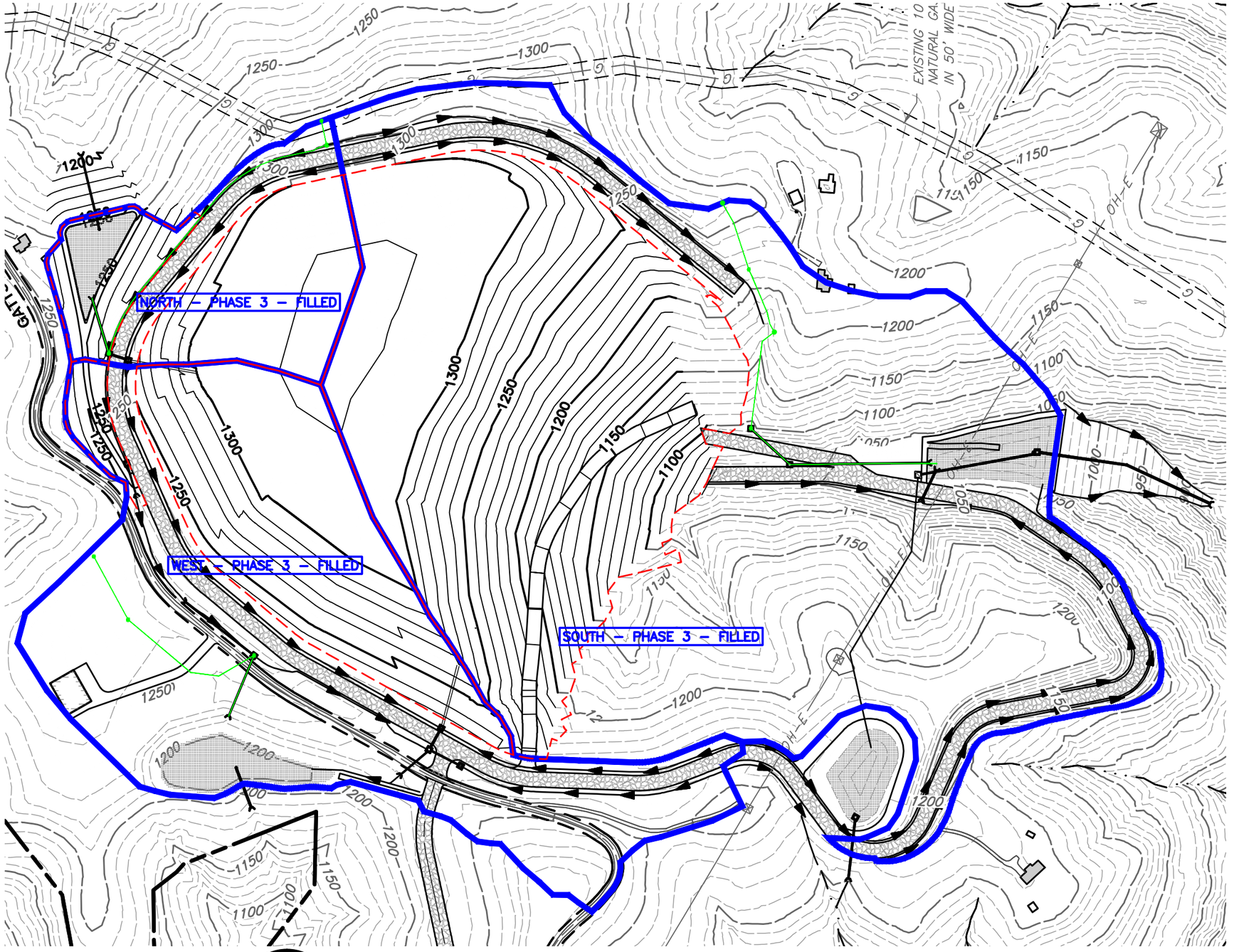

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PHASE 3 - FILLED - DRAINAGE MAP

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DATE:	APRIL 3, 2012	DWG SCALE:	1"=300'	PROJECT NO:	110-416	E

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LEGEND:

Tc PATH

DRAINAGE AREA

DRAINAGE BERM/ CHANNEL

DRAINAGE AREA NAME — DRAINAGE NAME

EXISTING CONTOURS — 1000

PROPOSED TOP OF LINER/FILL GRADING — 1000

DISTURBED LIMITS

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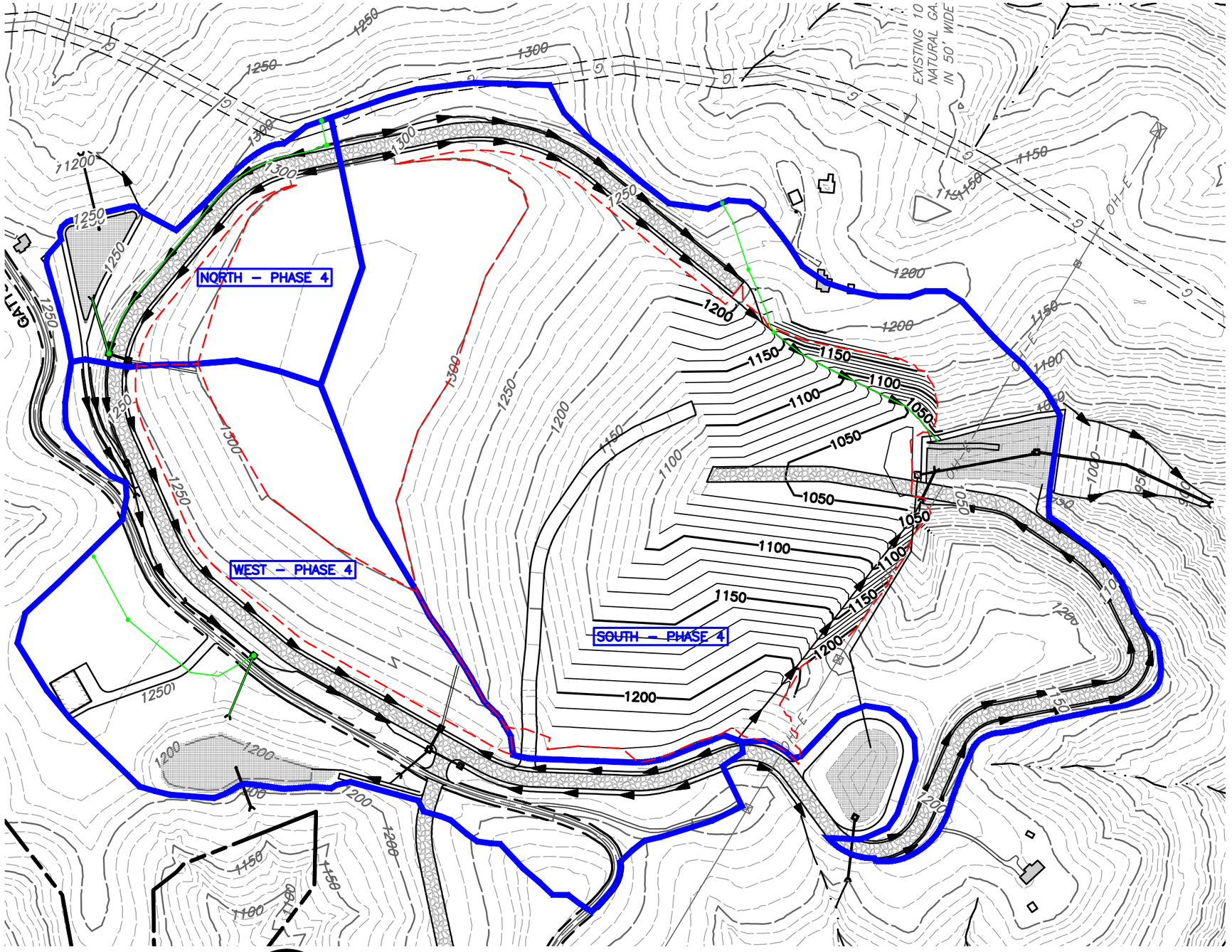

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513-985-0226 · 800-759-5614
www.cecinc.com

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PHASE 4 - DRAINAGE MAP

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LEGEND:

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- DRAINAGE BERM/ CHANNEL
- DRAINAGE AREA NAME — DRAINAGE NAME
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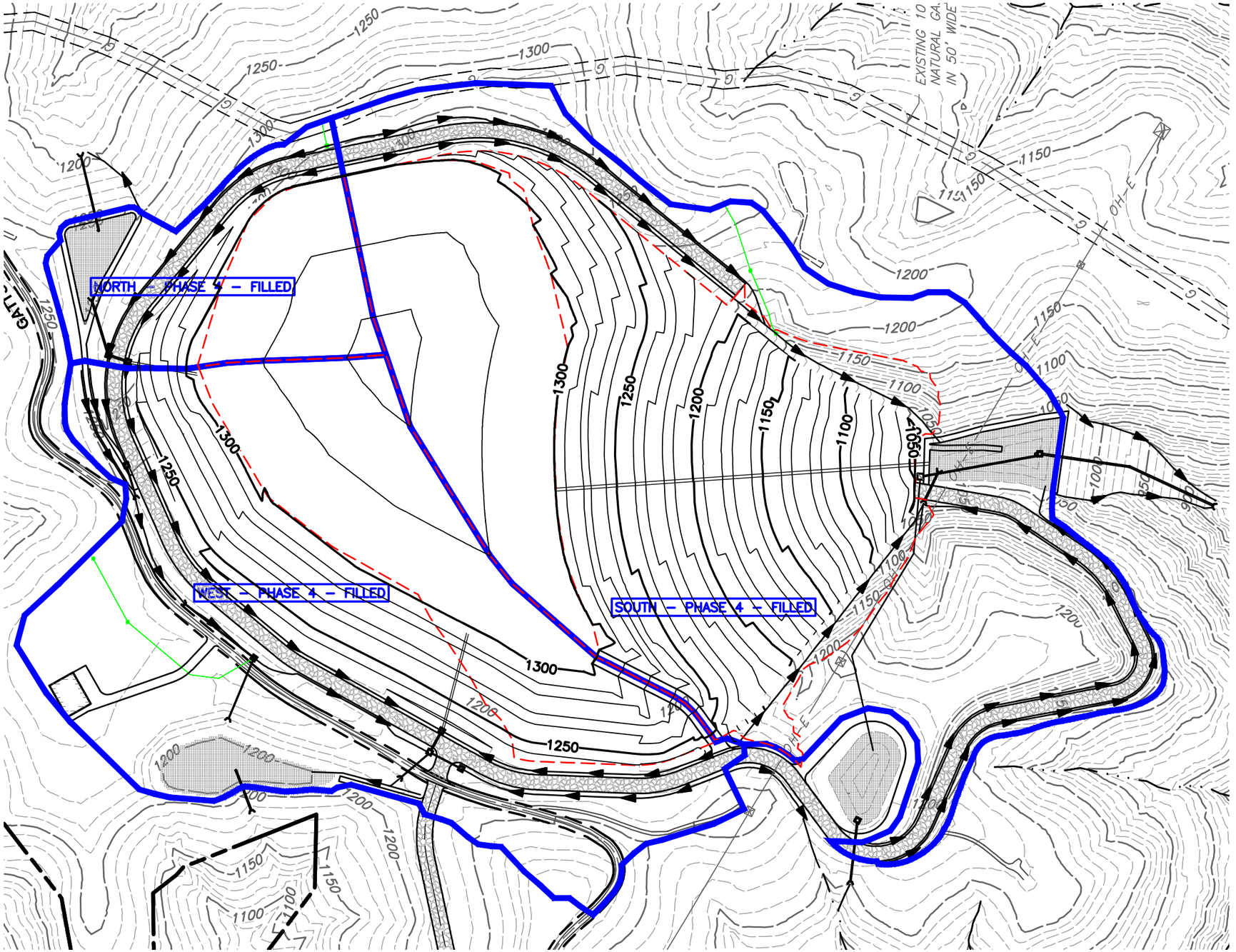

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PHASE 4 - FILLED - DRAINAGE MAP

DRAWN BY:	MTF	CHECKED BY:	JDM	APPROVED BY:		FIGURE NO.:
DATE:	APRIL 3, 2012	DWG SCALE:	1"=300'	PROJECT NO:	110-416	G

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LEGEND:

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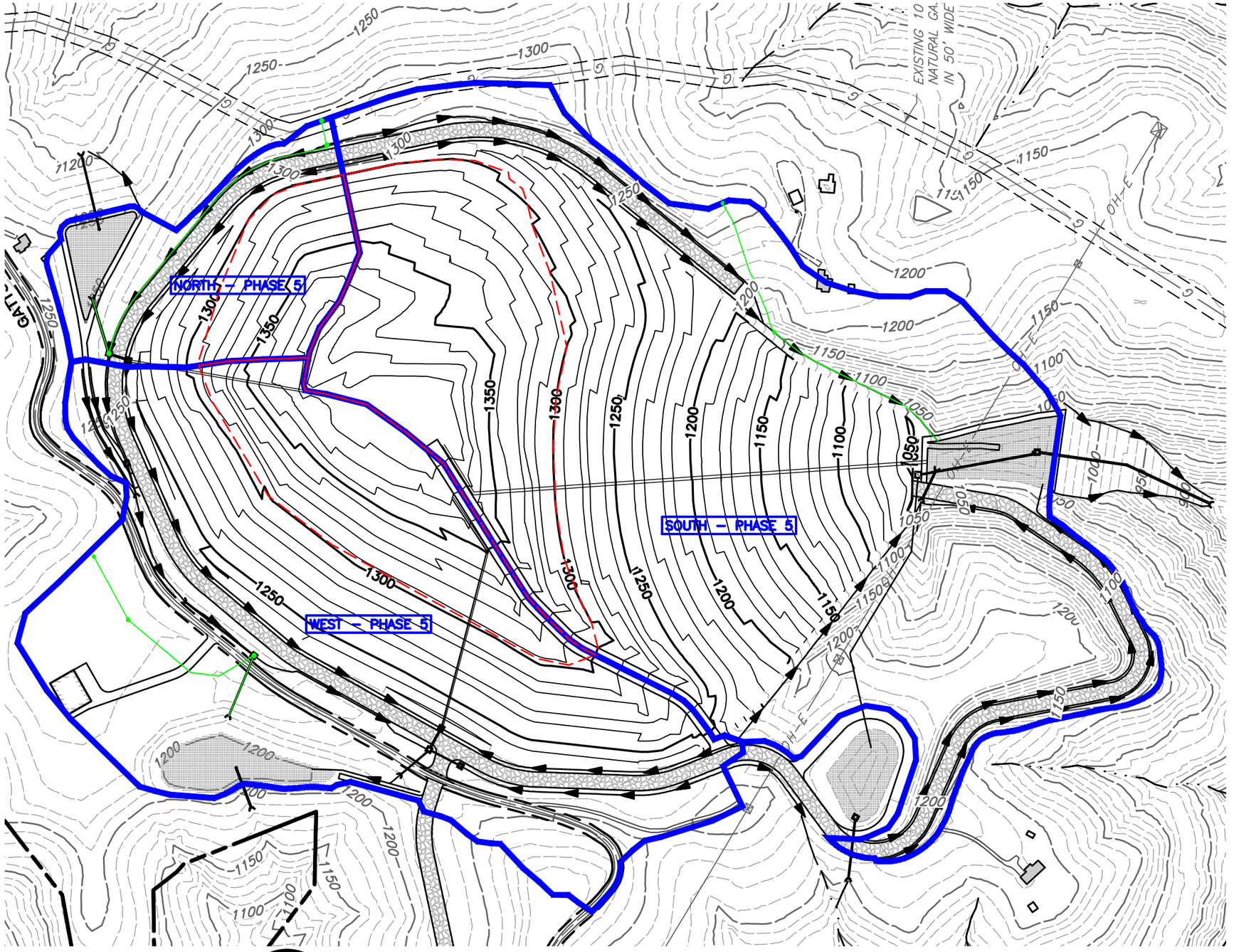

NORTH
SCALE IN FEET
0 300 600

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American Electric Power
Mitchell Landfill
Gatts Ridge Road
Marshall County, West Virginia

PHASE 5 - DRAINAGE MAP

DRAWN BY:	MTF	CHECKED BY:	JDM	APPROVED BY:		FIGURE NO.:
DATE:	APRIL 3, 2012	DWG SCALE:	1"=300'	PROJECT NO:	110-416	H

P:\2011\110-416\-CADD\DWG\Xrefs\110-416-HYD-Phase 5.dwg[B PHASE 5] LS:(05/04/2012 - tford) - LP: 4/5/2012 10:19 AM

LEGEND:

Tc PATH

DRAINAGE AREA

DRAINAGE BERM/ CHANNEL

DRAINAGE AREA NAME — DRAINAGE NAME

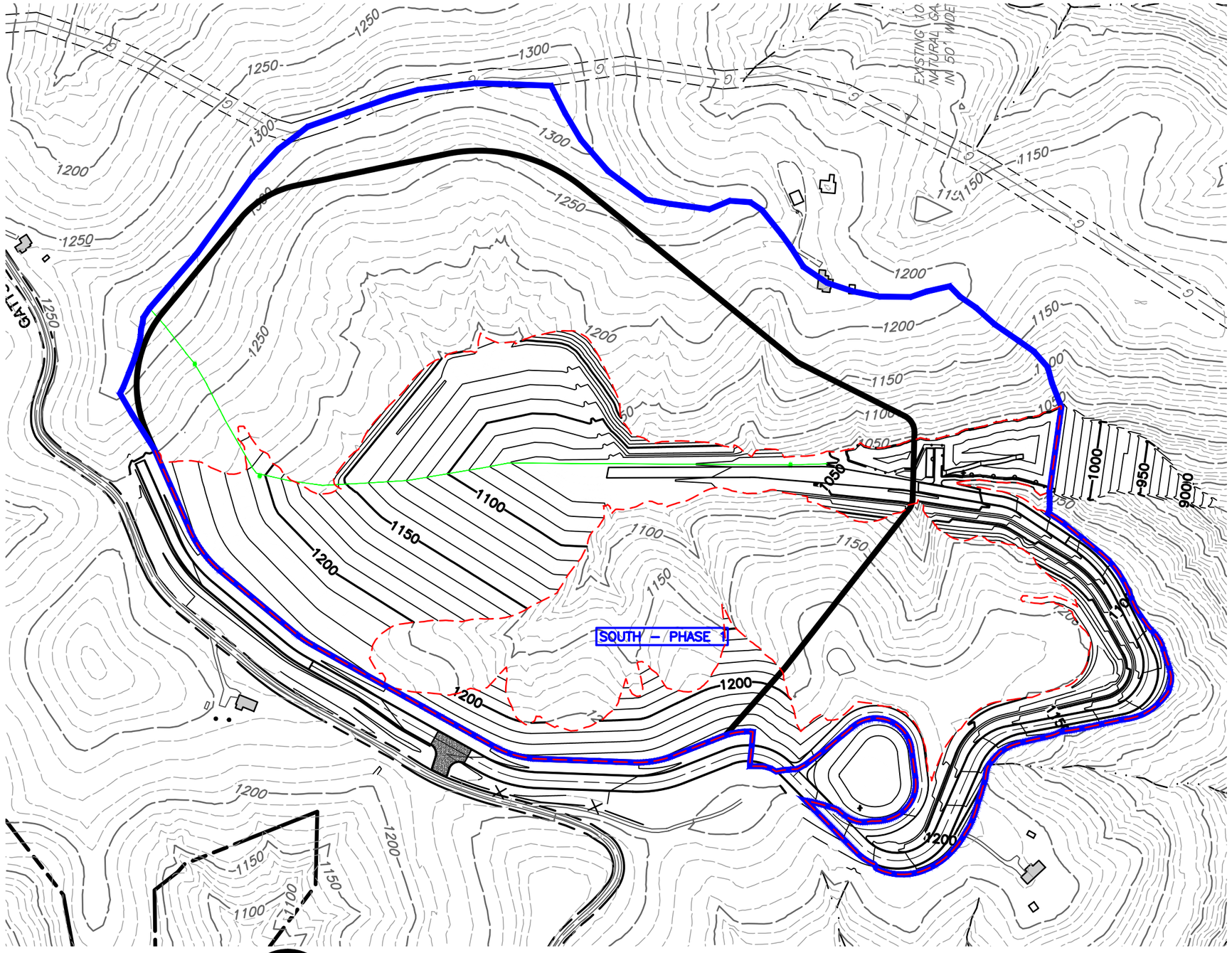
EXISTING CONTOURS — 1000

PROPOSED TOP OF LINER/FILL GRADING — 1000

DISTURBED LIMITS

NOTES:

1. REFER TO HYDRAFLOW OUTPUT FOR DETAILED INFORMATION REGARDING TIME OF CONCENTRATIONS, FLOW LENGTHS AND CN NUMBERS.
2. POND SIZING AND DESIGN CAN BE FOUND IN THE CALCULATION ENTITLED "SEDIMENT POND DESIGN CALCULATIONS."



NORTH
SCALE IN FEET
0 300 600

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American Electric Power
Mitchell Landfill
Gatts Ridge Road
Marshall County, West Virginia

SOUTH POND
PHASE 1 DRAINAGE MAP

DRAWN BY:	MTF	CHECKED BY:	JRI	APPROVED BY:		FIGURE NO.:
DATE:	JANUARY 25, 2013	DWG SCALE:	1"=300'	PROJECT NO:	110-416	A

P:\2011\110-416\-CADD\DWG\Xrefs\Phase 1A Landfill\110-416_XR_HYD Post Phase 1A-Final.dwg[1 PHASE 1] LS:(25/01/2013 - tford) - LP: 1/25/2013 10:15 AM

APPENDIX B; SECTION 2

RUN-OFF CONTROL FEATURE SUPPORTING CALCULATIONS

WATER BALANCE CALCULATIONS

(Taken from the Solid Waste/NPDES Permit Application for the Mitchell Landfill)

APPENDIX C

SUPPORTING FIGURES

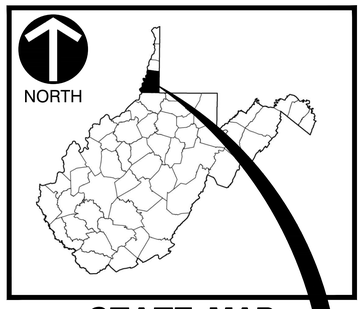
(Select drawings taken from the Solid Waste/NPDES Permit Application for the Mitchell Landfill) Consist

DWG NO: 12-30110-01-A

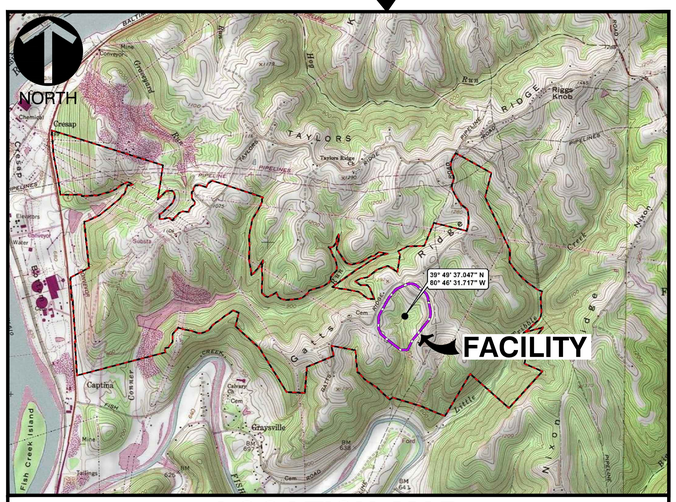
SHEET INDEX	
DRAWING NO.	SHEET TITLE
12-30110-01	TITLE SHEET
12-30110-13	GENERAL PHASING PLAN
12-30110-15	LINER PLAN WITH LEACHATE COLLECTION SYSTEM
12-30110-16	LEACHATE COLLECTION SYSTEM LAYOUT
12-30110-18	TOP OF FINAL COVER PLAN
12-30110-21	PHASE 1 TOP OF LINER PLAN
12-30110-22	PHASE 1 TOP OF WASTE AND PHASE 2 TOP OF LINER
12-30110-23	PHASE 2 TOP OF WASTE AND PHASE 3 TOP OF LINER
12-30110-24	PHASE 3 TOP OF WASTE AND PHASE 4 TOP OF LINER
12-30110-25	PHASE 4 TOP OF WASTE
12-30110-26	PHASE 5 TOP OF WASTE
12-30110-27	WEST POND PLAN AND SECTIONS
12-30110-28	NORTH POND PLAN AND SECTIONS
12-30110-40	SOUTHWEST DRAINAGE SWALE PLAN AND PROFILE
12-30110-41	SOUTHEAST DRAINAGE SWALE PLAN AND PROFILE
12-30110-43	EROSION AND SEDIMENTATION CONTROL DETAILS AND NOTES
12-30110-44	DOWNCHUTE, CATCH BASIN, AND HEADWALL DETAILS
12-30110-45	STORM AND DRAINAGE DETAILS
12-30110-46	TYPICAL PERIMETER SECTION AND LINER TERMINATION DETAILS
12-30110-47	LEACHATE COLLECTION AND UNDERDRAIN DETAILS
12-30110-48	LANDFILL LINER AND CAP DETAILS
12-30110-49	SEDIMENTATION POND DETAILS
12-30110-50	LEACHATE STORAGE POND AND SEDIMENTATION POND DETAILS
DR-1	SOUTH POND PLAN
DR-2	POND DETAILS
DR-3	TEMPORARY SEDIMENT POND
DR-4	LEACHATE STORAGE PLAN
DR-5	LEACHATE STORAGE POND DETAILS

MITCHELL LANDFILL
MARSHALL COUNTY, WEST VIRGINIA

RUN-ON, RUN-OFF CONTROL PLAN



STATE MAP
N.T.S.



LOCATION MAP SCALE: 1" = 2000'

PREPARED FOR:

AEP AMERICAN ELECTRIC POWER

APPLICANT/OWNER/OPERATOR :

OHIO POWER COMPANY
d/b/a AMERICAN ELECTRIC POWER, INC.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PREPARED BY:

Civil & Environmental Consultants, Inc.

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
5899 MONTCLAIR BOULEVARD
CINCINNATI, OHIO 45150

OCTOBER 2016

CEC PROJECT NO. 162-507

GENERAL NOTES

1. DRAWINGS PRESENTED IN THIS RUN-ON, RUN-OFF CONTROL PLAN WERE SELECTED FROM THE EXISTING PERMIT DRAWING SET ASSOCIATED ORIGINALLY SUBMITTED IN APRIL 2012 AND AMENDED WITH DESIGN REVISIONS IN JANUARY 2013. WITH THE EXCEPTION OF THIS TITLE SHEET, THESE DRAWINGS REMAIN UNCHANGED FROM THEIR ORIGINAL FORM.
2. THESE DRAWINGS WILL BE REVISED/REPLACED AS-NEEDED DURING PERIODIC REVIEWS OF THE RUN-ON, RUN-OFF CONTROL PLAN.

DATE	NO.	DESCRIPTION	APPD.

REVISIONS

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OHIO POWER COMPANY
MITCHELL PLANT
MARSHALL COUNTY WEST VIRGINIA
MITCHELL LANDFILL

TITLE SHEET

DWG NO: 12-30110-01-A

SCALE: AS NOTED | CIVIL ENGINEERING
DR: - | CH: - | SUP: - | ENG: - | DATE: -
APPROVED BY:

*HAND SIGNATURE ON FILE

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DRAWN BY:	JHG	CHECKED BY:	TDM	APPROVED BY:	*APA
DATE:	SEPTEMBER 2016	DWG SCALE:	AS NOTED	PROJECT NO:	162-507

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AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 09-MAY-17
PLOTTED BY: OSKAR MAUTE
BY: I:\SHARK\DP

I:\Shr-cinfiles\projects\162\162-507\~2400\Dwg\[DWG110402502_12-30110-01-A.dwg]001 SEPARATELY LS(9/22/2016 - jhg[pm]) - LP: 9/22/2016 2:23 PM

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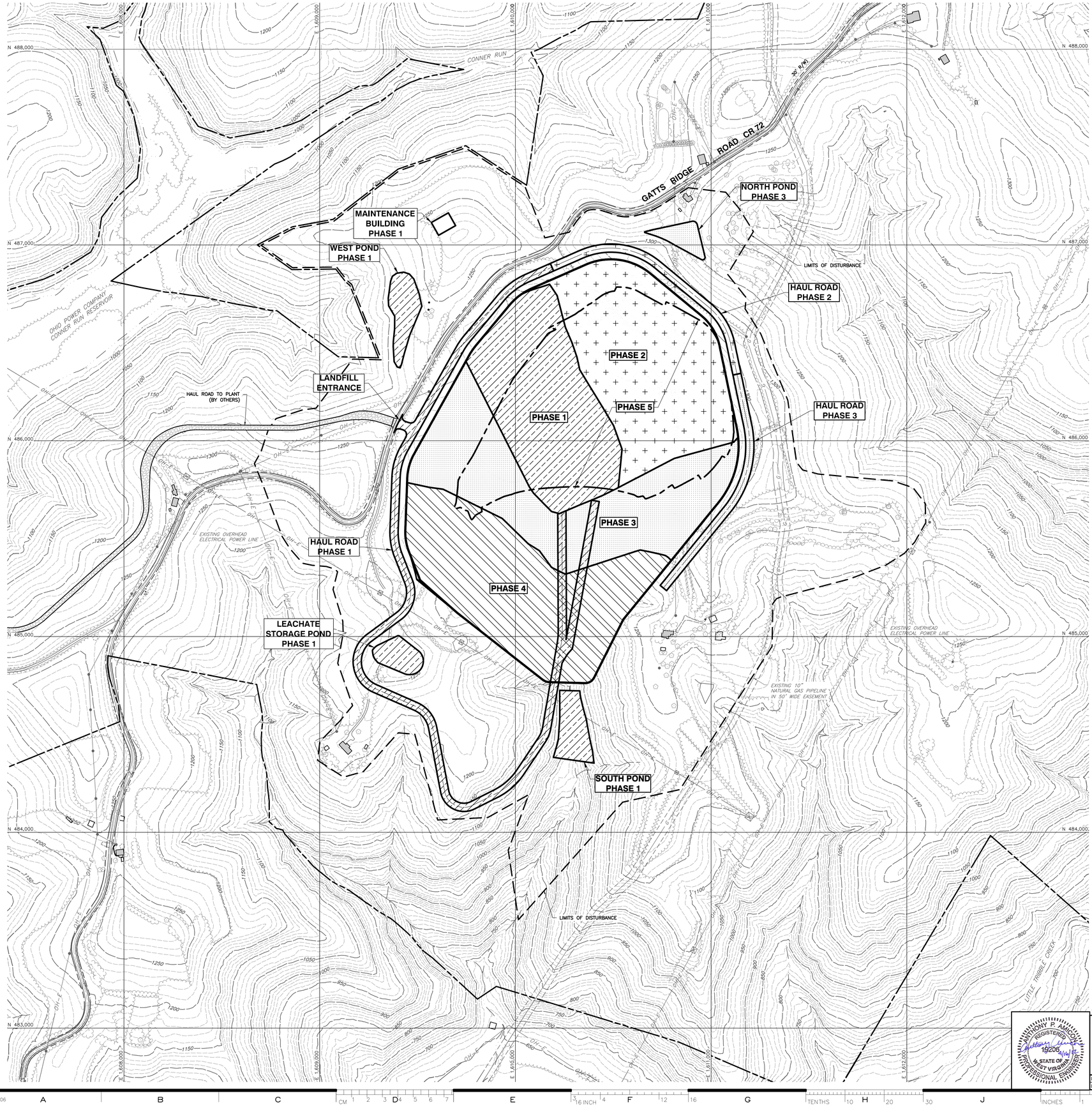
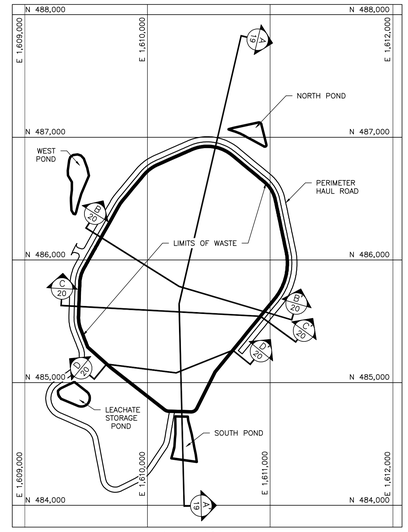
DWG NO: 12-30110-13-A





KEY PLAN
N.T.S.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- PROPOSED HAUL ROAD
- LIMITS OF PHASE 1 DEVELOPMENT
- LIMITS OF PHASE 2 DEVELOPMENT
- LIMITS OF PHASE 3 DEVELOPMENT
- LIMITS OF PHASE 4 DEVELOPMENT
- LIMITS OF PHASE 5 DEVELOPMENT (TO BE LOCATED ABOVE PHASES 1 THRU 4)
- CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER (C 20 / C 20)

NOTES:

1. THE HAUL ROAD AND DITCH LINES ARE SHOWN TO REFERENCE THE PROPOSED PHASE LINES TO EXISTING CONDITIONS.
2. FOR STOCKPILE LOCATIONS SEE DRAWING 12-3011-042. STOCKPILES TO BE PHASED AS NECESSARY.
3. REFER TO DRAWINGS 12-30110-19 AND 12-30110-20 FOR THE LANDFILL CROSS SECTIONS.
4. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW.

PHASE	WASTE CAPACITY (Cubic Yards)	ACRES
1	556,000	12.1
2	1,829,000	15.1
3	2,540,000	14.8
4	3,524,000	15.6
5	1,469,000	24.3
TOTAL	9,918,000	57.6

1. ACRES ARE PROJECTED ONTO HORIZONTAL PLANE
2. PHASE 5 IS ABOVE THE OTHER PHASES AND NOT INCLUDED IN THE TOTAL FOOTPRINT ACREAGE

NORTH

SCALE IN FEET
0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICON REGISTERED PROFESSIONAL ENGINEER STATE OF WEST VIRGINIA 19208

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

GENERAL PHASING PLAN

DWG NO: 12-30110-13-A

SCALE: 1"=200' | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

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DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

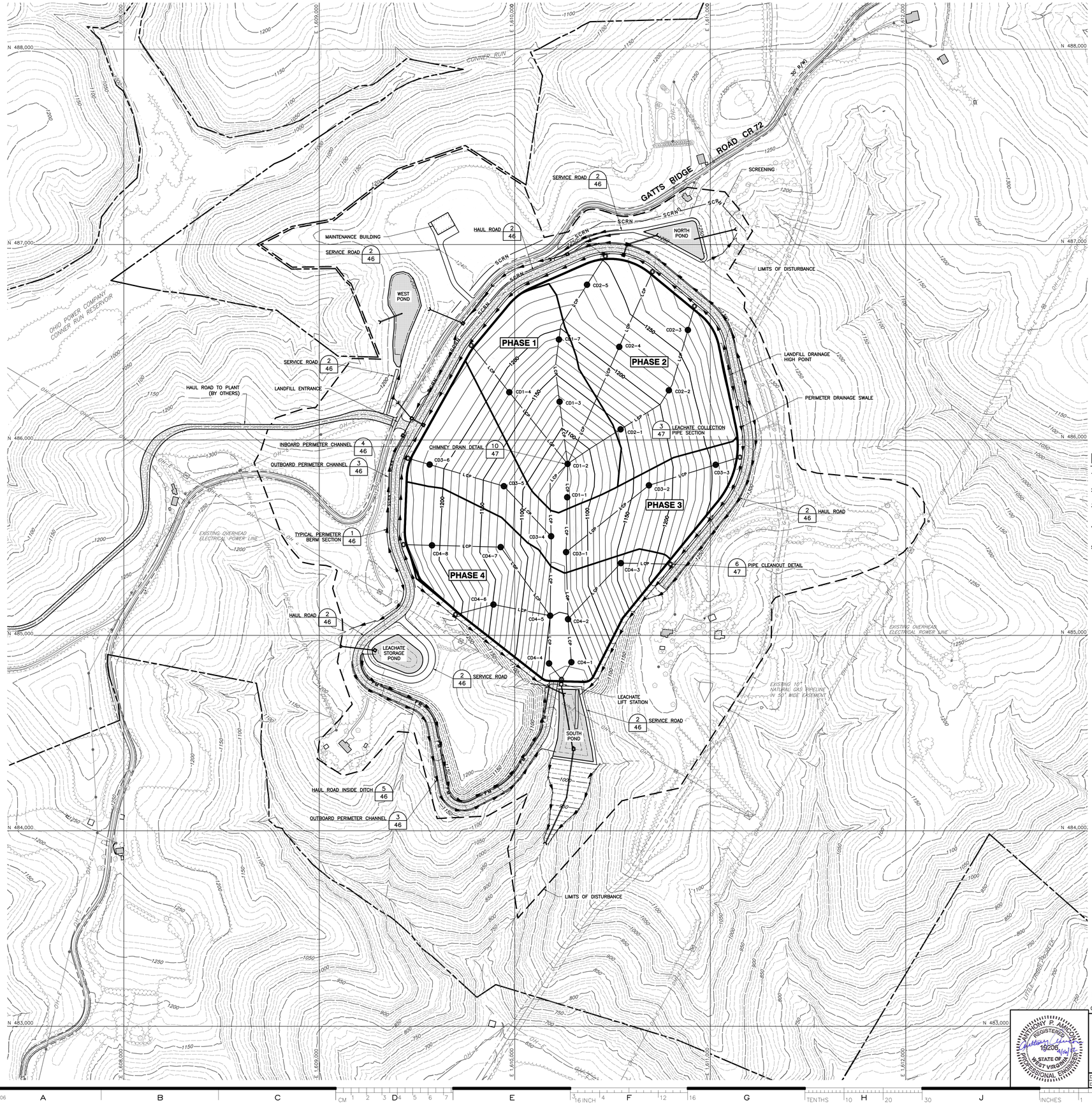
AEP AMERICAN ELECTRIC POWER

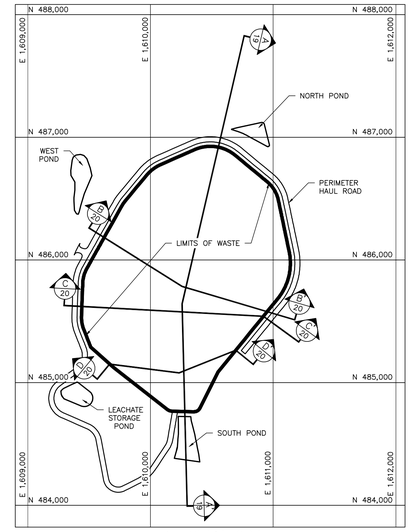
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 10-JAN-13 PLOTTED BY: USERPLOT

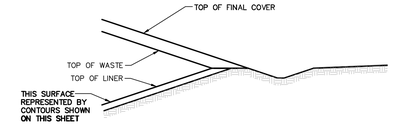
IGS0506

DWG NO: 12-30110-15-A





KEY PLAN
N.T.S.



TYPICAL LANDFILL ID KEY
N.T.S.

NOTES:

1. THIS DRAWING DEPICTS THE LINER AND LEACHATE COLLECTION SYSTEM ACROSS THE ENTIRE LANDFILL FOOTPRINT. REFER TO PHASE DRAWINGS FOR SEQUENCING AND CONSTRUCTION DETAILS.
2. REFER TO DRAWING 12-30110-16 FOR THE NUMBER OF LEACHATE COLLECTION PIPES BETWEEN CHIMNEY DRAINS AND THE LEACHATE COLLECTION PIPE SIZES.
3. ALL LEACHATE THAT DRAINS FROM THE MITCHELL LANDFILL WILL BE DIRECTED TO THE LEACHATE LIFT STATION AT THE SOUTH END OF THE LANDFILL. THE LIFT STATION WILL BE EQUIPPED WITH A PUMP SYSTEM AND ASSOCIATED PIPING TO CONVEY LEACHATE TO THE LEACHATE STORAGE POND. DETAILED DESIGN OF THE LIFT STATION, PUMPS, PUMP CONTROLS, AND DISCHARGE PIPELINE WILL BE COMPLETED BY OTHERS.
4. THE CHIMNEY DRAINS WILL BE LOCATED ABOVE DESIGNATED LEACHATE COLLECTION PIPES AND WILL BE CONSTRUCTED VERTICALLY FROM THE LINER TO THE ULTIMATE TOP OF WASTE ELEVATION. PROTECTION OF TEMPORARILY ABANDONED CHIMNEY DRAINS WILL BE REQUIRED TO FACILITATE USE AND EXTENSION OF THE CHIMNEY DRAINS IN SUBSEQUENT PHASES.
5. TEMPORARY PROTECTION TO BE PROVIDED OVER CHIMNEY DRAINS PRIOR TO PLACEMENT OF ANY TEMPORARY COVER SOIL.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- CD1-1 CHIMNEY DRAIN AND NUMBER
- CD1-1 CHIMNEY DRAIN AND NUMBER PREVIOUSLY BUILT
- LCP LEACHATE COLLECTION PIPE
- CLEANOUT
- FM PROPOSED LEACHATE FORCE MAIN

NORTH
SCALE IN FEET
0 200 400
CONTOUR INTERVAL = 10 FEET

ANTHONY P. MARCONI REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

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DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

DATE	NO.	DESCRIPTION	APP'D
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

LINER PLAN WITH LEACHATE COLLECTION SYSTEM

DWG NO: 12-30110-15-A

SCALE: 1"=200'	CIVIL ENGINEERING
DR:	
CH:	
SUP:	
ENG:	
DATE:	

APPROVED BY:

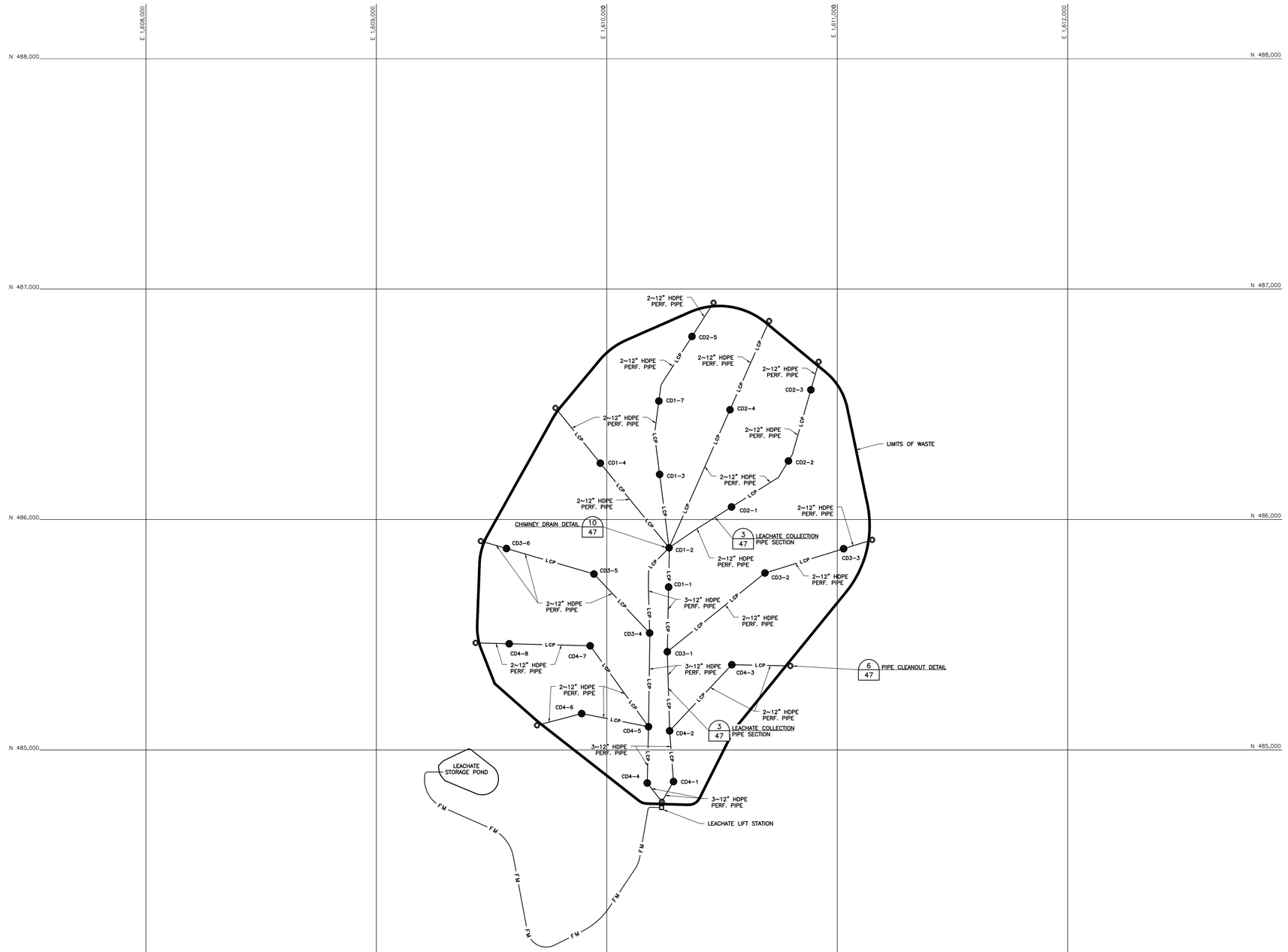
AEP AMERICAN ELECTRIC POWER

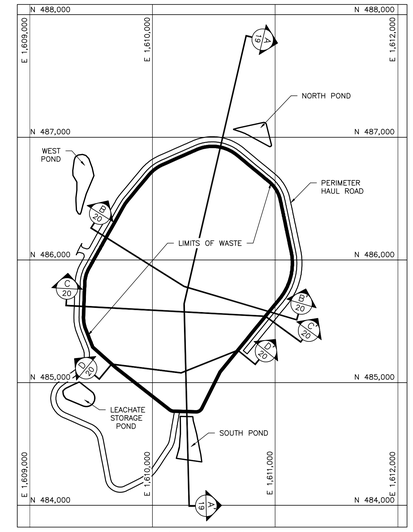
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: DD/MM/YY
PLOT TIME: HH:MM:SS
BY: USERPLOT

IGS0506

DWG NO: 12-30110-16-A





KEY PLAN
N.T.S.

LEGEND

- LIMITS OF WASTE
- CD1-1 — CHIMNEY DRAIN AND NUMBER
- LCP — LEACHATE COLLECTION PIPE
- CLEANOUT
- FM — PROPOSED LEACHATE FORCE MAIN

NOTES:

1. MINIMUM LINER SLOPES SHALL BE 2% AND MAXIMUM LINER SLOPES SHALL BE 33.33% (3H:1V)
2. FOR LEACHATE COLLECTION SYSTEM AND LINER SYSTEM DETAILS, SEE DRAWINGS 12-30110-46 AND 12-30110-47.
3. LEACHATE COLLECTION SYSTEM PIPES ARE TO BE LAID AT A 2% MINIMUM SLOPE.

NORTH
SCALE IN FEET
0 200 400

ANTHONY P. AMICON REGISTERED 19206 4/16/12 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

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4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
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DRAWN BY: DAR | CHECKED BY: JSF | APPROVED BY: APA
DATE: APRIL 2012 | DWG SCALE: AS NOTED | PROJECT NO: 110-416

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

LEACHATE COLLECTION SYSTEM LAYOUT

DWG NO: 12-30110-16-A

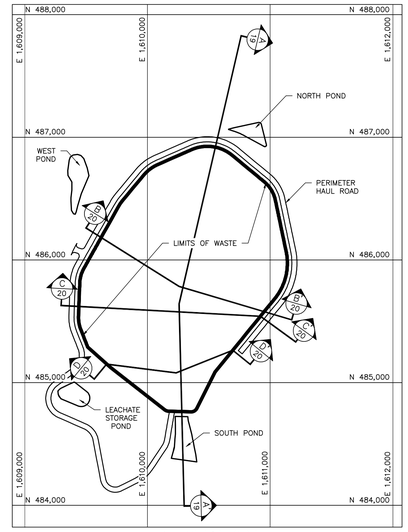
SCALE: 1"=200' | CIVIL ENGINEERING
DR: . | CH: . | SUP: . | ENG: . | DATE: .
APPROVED BY: .

AEP AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 4/20/2012 - 7:57:17 AM
PLOT SCALE: 1.0000 '/ INCH
BY: USERPLOT

IGS0506

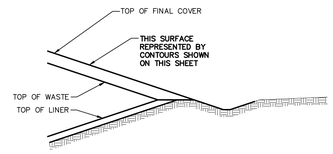
DWG NO: 12-30110-18-A



KEY PLAN
N.T.S.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER
- FM PROPOSED LEACHATE FORCE MAIN



TYPICAL LANDFILL ID KEY
N.T.S.

NOTES:

1. SCREENING SHALL BE PROVIDED BY NATURAL OBJECTS, PLANTINGS, FENCES OR OTHER APPROPRIATE MEANS SO THAT THE LANDFILL IS NOT READILY VISIBLE FROM GATTS RIDGE ROAD.
2. REFER TO DRAWINGS 12-30110-19 AND 12-30110-20 FOR THE LANDFILL CROSS SECTIONS.
3. HILLSIDE EXCAVATIONS WILL BE TYPICALLY IN ROCK WITH SOME SOIL EXCAVATION. EXCAVATIONS IN SOIL SHALL BE AT A MAXIMUM 2H:1V. EXCAVATION IN ROCK SHALL BE AT A MAXIMUM 1H:2V, DEPENDING ON ROCK QUALITY AND CONDITION. THE STEEPNESS OF ROCK CUTS SHALL BE DETERMINED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER. FOR LAYOUT PURPOSES, HILLSIDE CUTS ARE SHOWN AS 1H:1V.
4. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.

NORTH

SCALE IN FEET
0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APP'D
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

TOP OF FINAL COVER PLAN

DWG NO: 12-30110-18-A

SCALE: 1"=200' | CIVIL ENGINEERING

DR: CH: SUP: ENG: DATE: | APPROVED BY:

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 - 800.759.5614 - Fax: 513.985.0228
www.cecinc.com

DRAWN BY: DAR CHECKED BY: JSF APPROVED BY: APA
DATE: APRIL 2012 DWG SCALE: AS NOTED PROJECT NO: 110-416

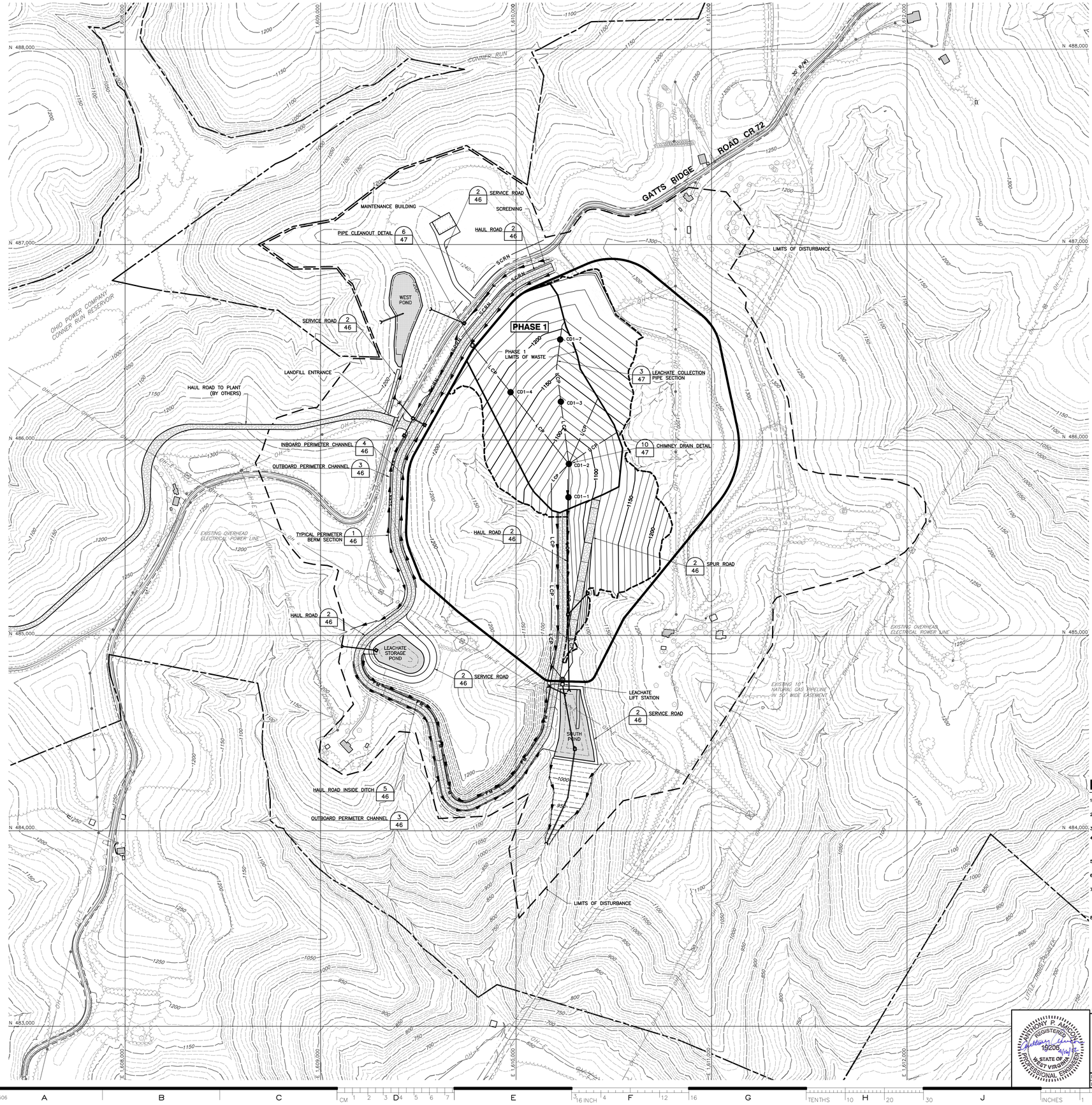
AEP AMERICAN ELECTRIC POWER

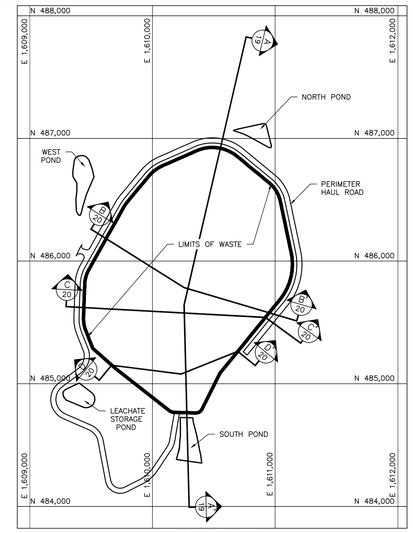
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-MAR-12
PLOT TIME: 10:45:47
BY: USERPLOT

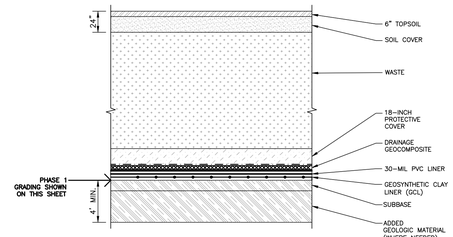
IGS0506

DWG NO: 12-30110-21-A





KEY PLAN
N.T.S.



COMPONENT DETAIL
N.T.S.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- C EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- PROPOSED CONSTRUCTION PHASELINE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- CD1-1 CHIMNEY DRAIN AND NUMBER
- CD1-1 CHIMNEY DRAIN AND NUMBER PREVIOUSLY BUILT
- LCP LEACHATE COLLECTION PIPE
- CLEANOUT
- FM PROPOSED LEACHATE FORCE MAIN

NOTES:

1. SEE DRAWING 12-30110-16 FOR LEACHATE PIPING OVERALL LAYOUT, PIPE QUANTITIES AND PIPE SIZE INFORMATION.
2. SCREENING SHALL BE PROVIDED BY NATURAL OBJECTS, PLANTINGS, FENCES OR OTHER APPROPRIATE MEANS SO THAT THE LANDFILL IS NOT READILY VISIBLE FROM GATTS RIDGE ROAD.
3. REFER TO DRAWINGS 12-30110-19 AND 12-30110-20 FOR THE LANDFILL CROSS SECTIONS.
4. HILLSIDE EXCAVATIONS WILL BE TYPICALLY IN ROCK WITH SOME SOIL EXCAVATION. EXCAVATIONS IN SOIL SHALL BE AT A MAXIMUM 2H:1V. EXCAVATION IN ROCK SHALL BE AT A MAXIMUM 1H:2V, DEPENDING ON ROCK QUALITY AND CONDITION. THE STEEPNESS OF ROCK CUTS SHALL BE DETERMINED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER. FOR LAYOUT PURPOSES, HILLSIDE CUTS ARE SHOWN AS 1H:1V.
5. TEMPORARY PROTECTION TO BE PROVIDED OVER CHIMNEY DRAINS PRIOR TO PLACEMENT OF ANY TEMPORARY COVER SOIL.
6. ALL PIPE WITHIN ACTIVE PHASE WILL BE PERFORATED AND PIPE BEYOND THE CONTAINMENT BERM WILL BE DUAL CONTAINED. SEE DETALS ON 12-30110-47.
7. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.
8. THE LEACHATE COLLECTION PIPES THAT ARE TO BE EXTENDED INTO PHASE 2 SHALL BE CAPPED AND PROTECTED FROM DAMAGE PRIOR TO PHASE 2 CONSTRUCTION.

NORTH
SCALE IN FEET
0 200 400
CONTOUR INTERVAL = 10 FEET

ANTHONY P. APA REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

PHASE 1 TOP OF LINER PLAN

DWG NO: 12-30110-21-A

SCALE: 1"=200' | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

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DRAWN BY: DAR | CHECKED BY: JSF | APPROVED BY: APA
DATE: APRIL 2012 | DWG SCALE: AS NOTED | PROJECT NO: 110-416

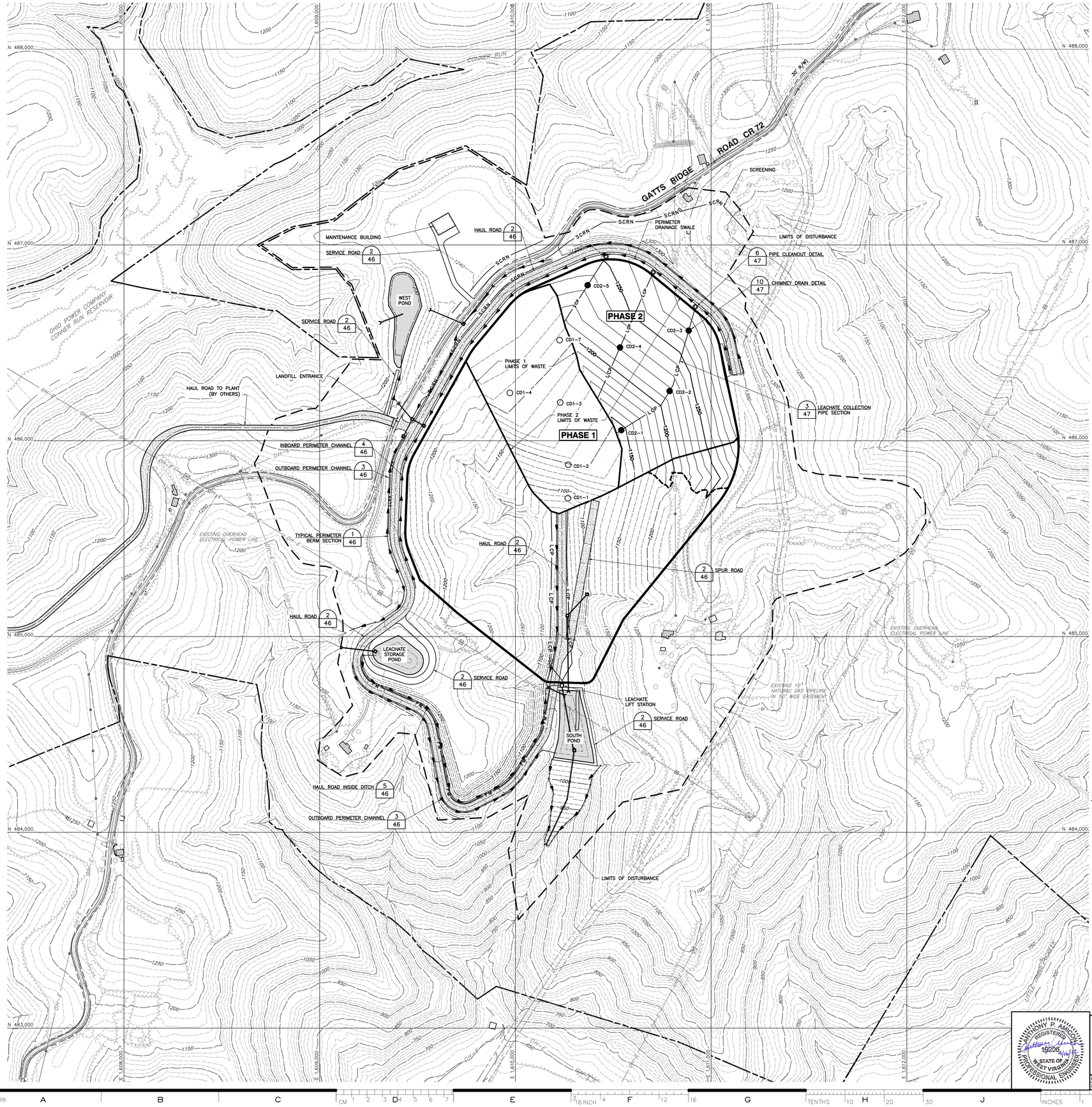
AEP AMERICAN ELECTRIC POWER

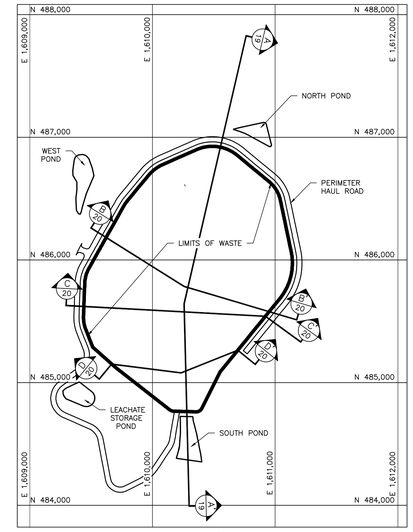
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-JUNE-2012
PLOT TIME: 08:44:46
BY: USERNAME

IGS0506

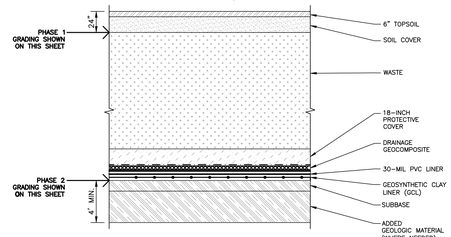
DWG NO: 12-30110-22-A





KEY PLAN

N.T.S.



COMPONENT DETAIL

N.T.S.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- PROPOSED CONSTRUCTION PHASELINE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- CD1-1 CHIMNEY DRAIN AND NUMBER
- CD1-1 CHIMNEY DRAIN AND NUMBER PREVIOUSLY BUILT
- LCP LEACHATE COLLECTION PIPE
- CLEANOUT
- FM PROPOSED LEACHATE FORCE MAIN

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NORTH

SCALE IN FEET

0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICO REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

PHASE 1 TOP OF WASTE PHASE 2 TOP OF LINER

DWG NO: 12-30110-22-A

SCALE: 1"=200' | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

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DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

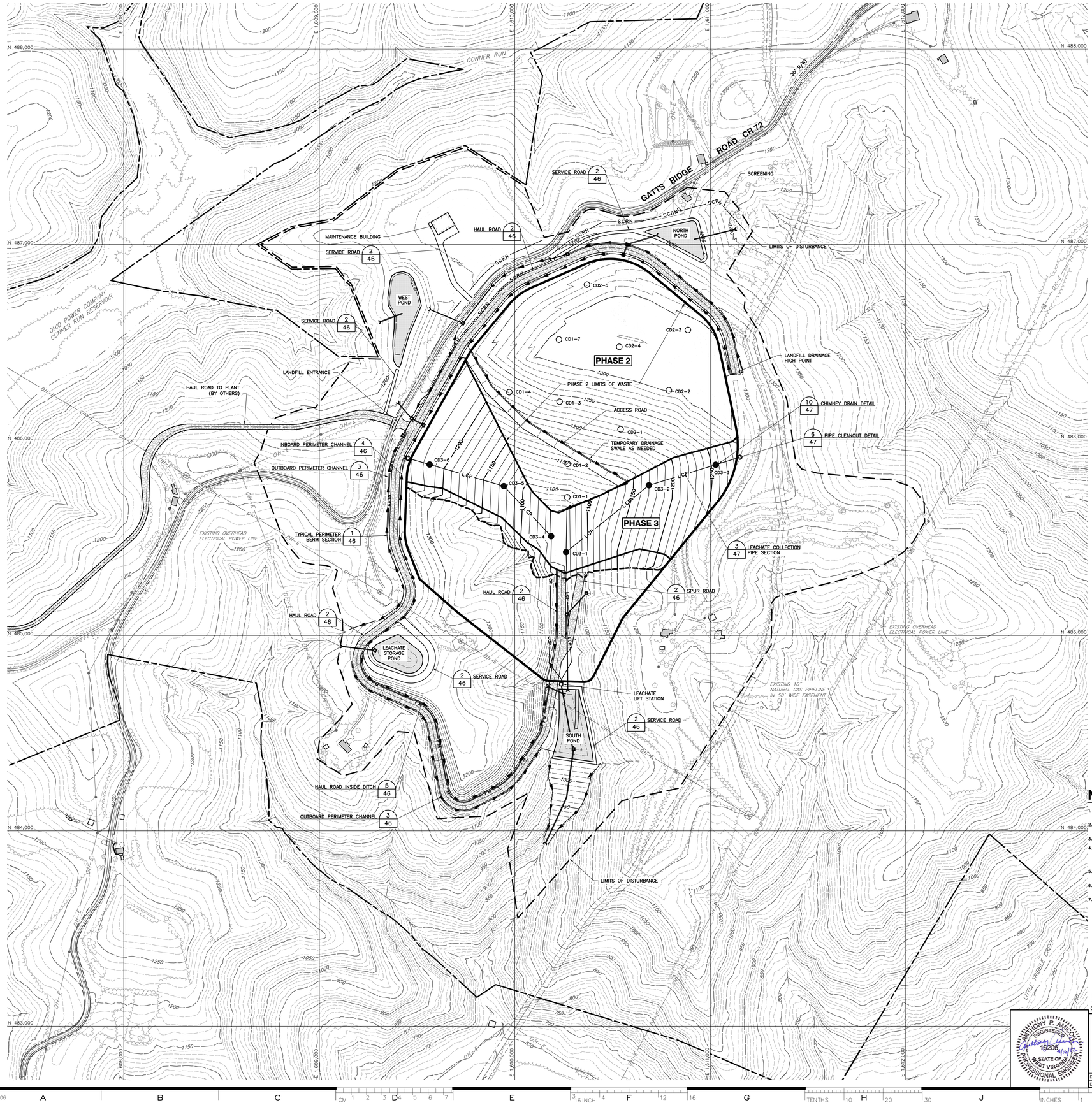
AEP AMERICAN ELECTRIC POWER

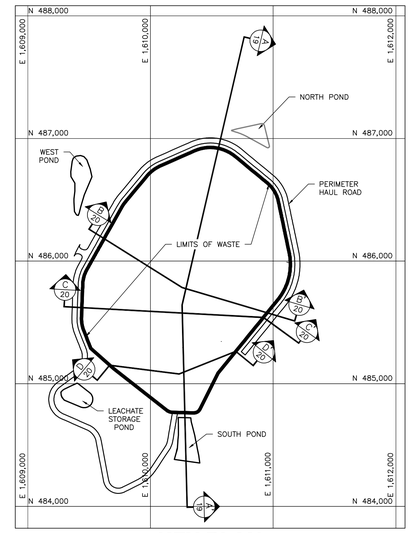
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 20-JUNE-12 TIME: 08:45:45 BY: USERNAME

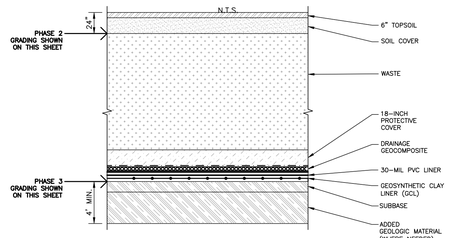
IGS0506

DWG NO: 12-30110-23-A





KEY PLAN



COMPONENT DETAIL

LEGEND

N.T.S.

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
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NORTH

SCALE IN FEET

0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road · Cincinnati, OH 45242
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DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

PHASE 2 TOP OF WASTE
PHASE 3 TOP OF LINER

DWG NO: 12-30110-23-A

SCALE: 1"=200'	CIVIL ENGINEERING
DR:	
CH:	
SUP:	
ENG:	
DATE:	

APPROVED BY:

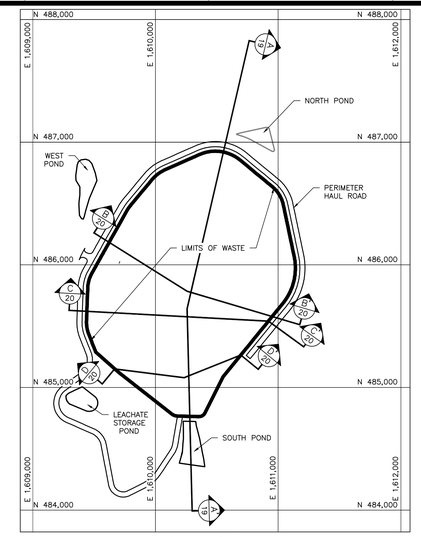
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-MAR-12
PLOTTED BY: APA
BYPLOTSPLOT

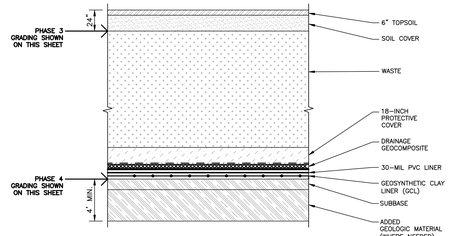
IGS0506

DWG NO: 12-30110-24-A



KEY PLAN

N.T.S.



COMPONENT DETAIL

N.T.S.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
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- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
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- LIMITS OF WASTE
- PROPOSED CONSTRUCTION PHASELINE
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8. DOWNCHUTE LOCATIONS SHOWN FOR INFORMATIONAL PURPOSES ONLY. DOWNCHUTES TO BE CONSTRUCTED WITHIN THE FINAL CAP SYSTEM.

NORTH

SCALE IN FEET

0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICON REGISTERED 19205 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APP'D
04/16/12	A	ISSUED FOR PERMIT	APA

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MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

PHASE 3 TOP OF WASTE PHASE 4 TOP OF LINER

DWG NO: 12-30110-24-A

SCALE: 1"=200' | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

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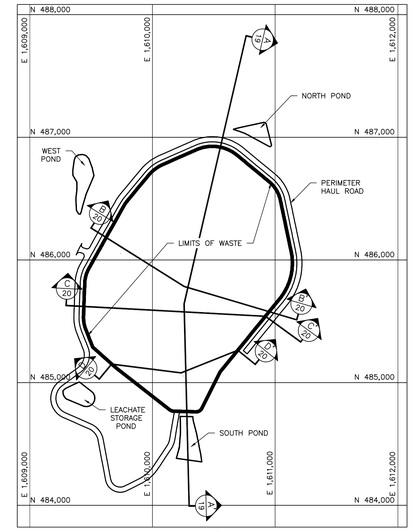
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-MAR-12
PLOT BY: JOSEPH MAYER
BY: USERPLOT

IGS0506

DWG NO: 12-30110-25-A



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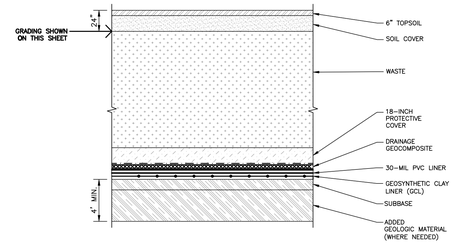

COMPONENT DETAIL
N.T.S.

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2. REFER TO DRAWINGS 12-30110-19 AND 12-30110-20 FOR THE LANDFILL CROSS SECTIONS.
3. HILLSIDE EXCAVATIONS WILL BE TYPICALLY IN ROCK WITH SOME SOIL EXCAVATION. EXCAVATIONS IN SOIL SHALL BE AT A MAXIMUM 2H:1V. EXCAVATION IN ROCK SHALL BE AT A MAXIMUM 1H:2V, DEPENDING ON ROCK QUALITY AND CONDITION. THE STEEPNESS OF ROCK CUTS SHALL BE DETERMINED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER. FOR LAYOUT PURPOSES, HILLSIDE CUTS ARE SHOWN AS 1H:1V.
4. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.
5. DOWNCHUTE LOCATIONS SHOWN FOR INFORMATIONAL PURPOSES ONLY. DOWNCHUTES TO BE CONSTRUCTED WITHIN THE FINAL CAP SYSTEM.

NORTH

SCALE IN FEET
0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICO REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

PHASE 4 TOP OF WASTE

DWG NO: 12-30110-25-A

SCALE: 1"=200' | CIVIL ENGINEERING

DR: . CH: . SUP: . ENG: . DATE: .

APPROVED BY:

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

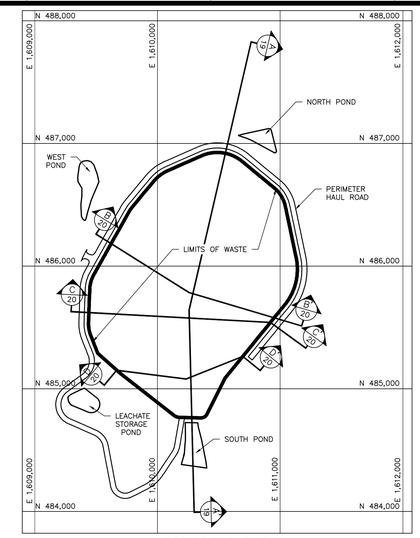
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

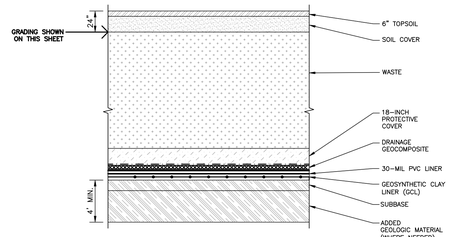
PLOT DATE: 05-JUNE-2012
PLOT TIME: 08:44:45
BY: USERNAME

IGS0506

DWG NO: 12-30110-26-A



KEY PLAN
N.T.S.



COMPONENT DETAIL
N.T.S.

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- PROPOSED CONSTRUCTION PHASELINE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- CD1-1 CHIMNEY DRAIN AND NUMBER
- CD1-1 CHIMNEY DRAIN AND NUMBER PREVIOUSLY BUILT
- LEACHATE COLLECTION PIPE
- CLEANOUT
- FM PROPOSED LEACHATE FORCE MAIN

NOTES:

1. SCREENING SHALL BE PROVIDED BY NATURAL OBJECTS, PLANTINGS, FENCES OR OTHER APPROPRIATE MEANS SO THAT THE LANDFILL IS NOT READILY VISIBLE FROM GATTS RIDGE ROAD.
2. REFER TO DRAWINGS 12-30110-19 AND 12-30110-20 FOR THE LANDFILL CROSS SECTIONS.
3. HILLSIDE EXCAVATIONS WILL BE TYPICALLY IN ROCK WITH SOME SOIL EXCAVATION. EXCAVATIONS IN SOIL SHALL BE AT A MAXIMUM 2H:1V. EXCAVATION IN ROCK SHALL BE AT A MAXIMUM 1H:2V, DEPENDING ON ROCK QUALITY AND CONDITION. THE STEEPNESS OF ROCK CUTS SHALL BE DETERMINED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER. FOR LAYOUT PURPOSES, HILLSIDE CUTS ARE SHOWN AS 1H:1V.
4. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.
5. PHASE 5 TO BE CONSTRUCTED ON TOP OF PREVIOUSLY CONSTRUCTED PHASES 1 THOUGH 4.
6. DOWNCHUTE LOCATIONS SHOWN FOR INFORMATIONAL PURPOSES ONLY. DOWNCHUTES TO BE CONSTRUCTED WITHIN THE FINAL CAP SYSTEM.

NORTH

SCALE IN FEET
0 200 400

CONTOUR INTERVAL = 10 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road · Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.ceainc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

PHASE 5 TOP OF WASTE

DWG NO: 12-30110-26-A

SCALE: 1"=200'	CIVIL ENGINEERING
DR:	
CH:	
SUP:	
ENG:	
DATE:	

APPROVED BY:

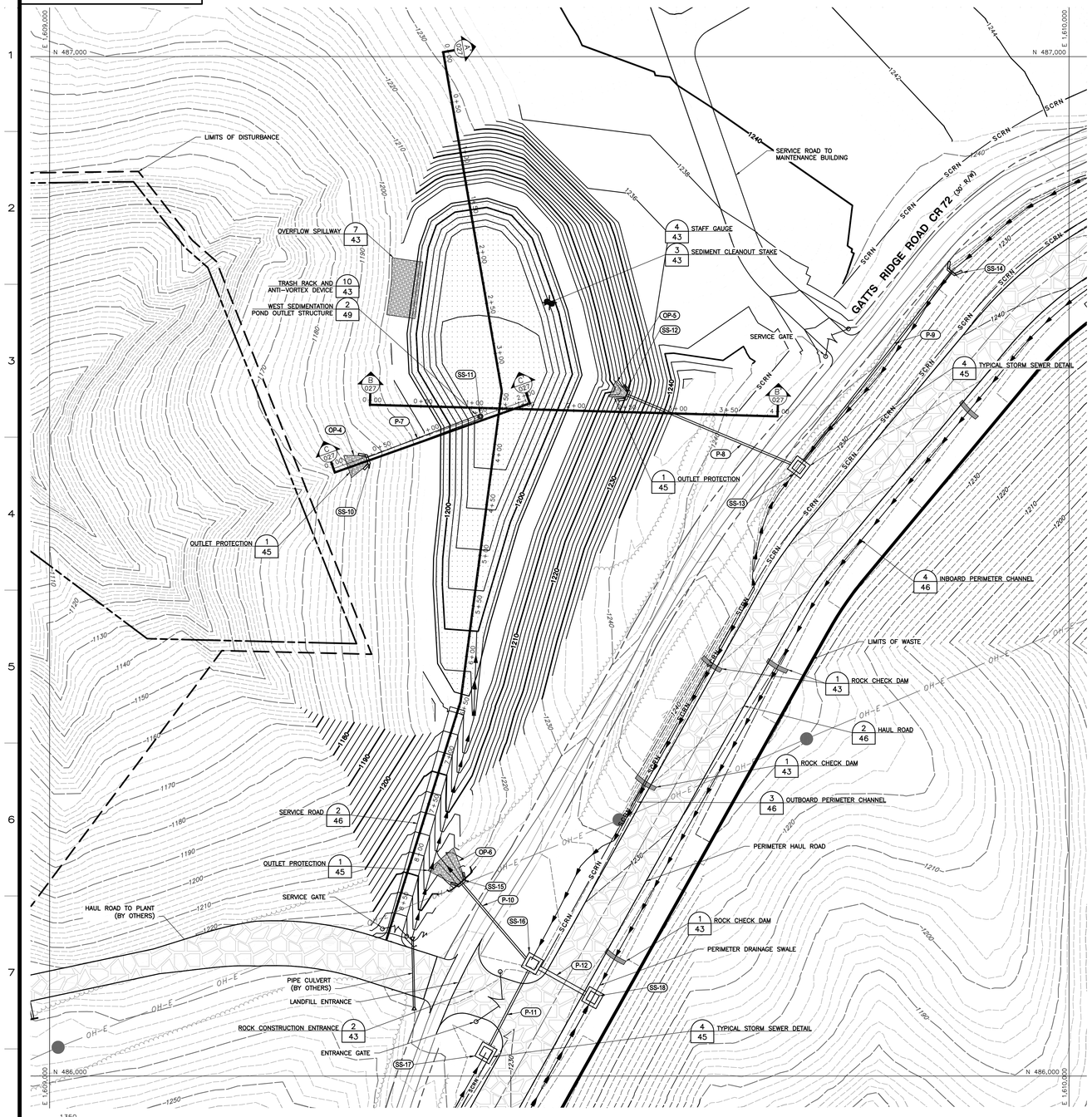
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05/JAN/11**
PLOT TIME: 11:**:**
BY: USERPLOT

IGS0506

DWG NO: 12-30110-27-A

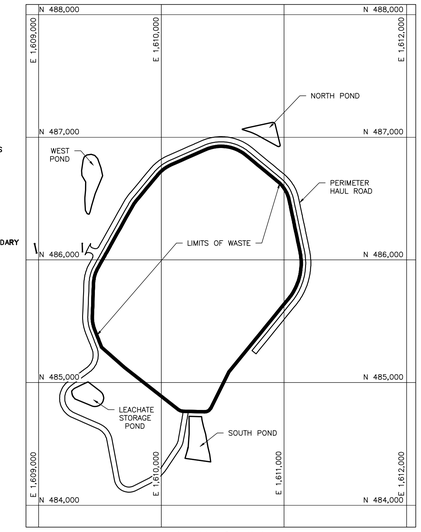


WEST POND		
NAME	VOLUME (CU FT)	ELEVATION (FT)
SEDIMENTATION	64,580	1195.10
CLEANOUT	38,748	1193.93
2-YEAR RUNOFF	218,805	1201.67
PRINCIPAL SPILLWAY	283,385	1201.67
10-YEAR RUNOFF	238,122	1202.06
EMERGENCY SPILLWAY		1202.67
25-YEAR RUNOFF	260,747	1202.53
100-YEAR RUNOFF	277,832	1202.89
TOP OF BERM*	347,395	1204.00

* TOTAL VOLUME OF POND INCLUDING SEDIMENT AND STORMWATER STORAGE.

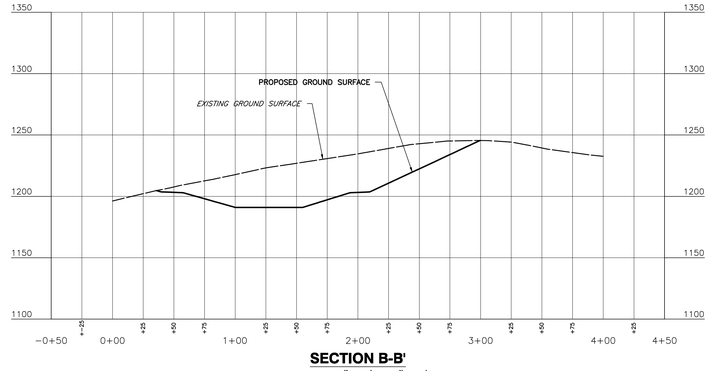
LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- EXISTING CONTOURS
- EXISTING STREAM
- EXISTING GAS PIPELINE
- EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- PROPOSED CONTOUR
- PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- PROPOSED RIP RAP
- PROPOSED ROCK CHECK DAM
- C/20 CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER
- SS-# PROPOSED STORM FEATURE NAME
- STAFF GAUGE



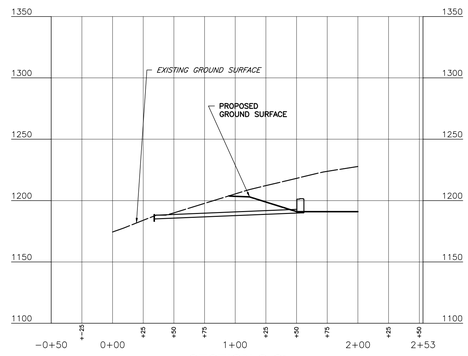
KEY PLAN

N.T.S.



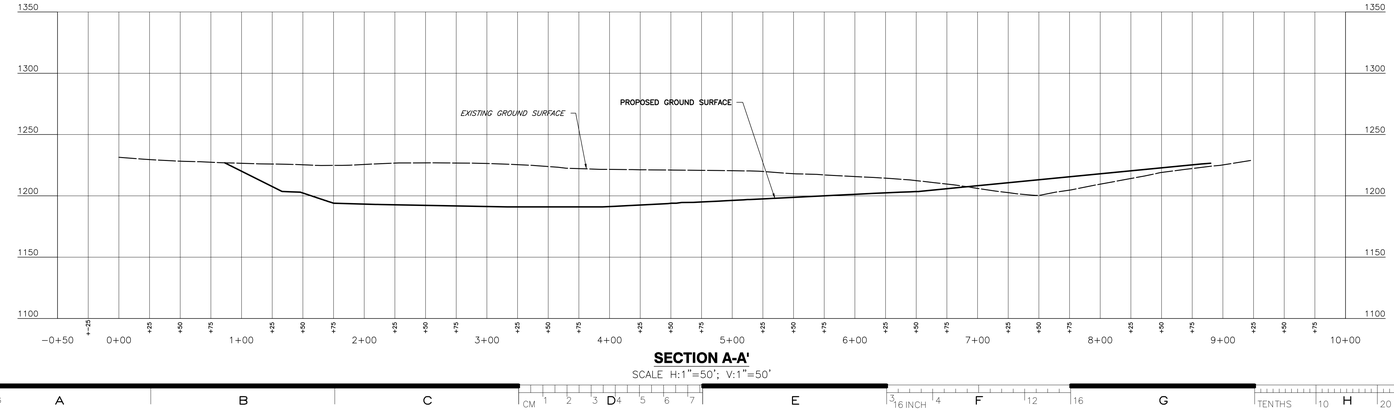
SECTION B-B'

SCALE H:1"=50'; V:1"=50'



SECTION C-C'

SCALE H:1"=50'; V:1"=50'

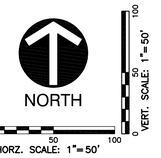


SECTION A-A'

SCALE H:1"=50'; V:1"=50'

NOTES:

1. SEE DRAWING 12-30110-45 FOR STORM AND DRAINAGE DETAILS.
2. SEE DRAWING 12-30110-49 FOR POND DETAILS.
3. ADD 1-FT OF MARKER STONE ON BOTTOM AND SIDE SLOPES OF POND. GRADING SHOWN IN THE POND REPRESENTS THE TOP OF THE MARKER STONE. OVER-EXCAVATION WILL BE NECESSARY IN POND TO INSTALL ANY LINER SYSTEM THAT MAY BE REQUIRED AND THE MARKER STONE (SEE DETAIL 3/49).
4. THIS POND IS LOCATED MAINLY IN A CUT CONDITION. A LINER MAY OR MAY NOT BE NECESSARY. THE NEED FOR A LINER SYSTEM AND THE COMPONENTS OF THE LINER SYSTEM WILL BE DETERMINED IN THE FIELD BY THE ENGINEER AFTER EXCAVATION OF THE POND HAS BEEN COMPLETED.
5. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.



CONTOUR INTERVAL = 2 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

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4274 Glendale-Milford Road · Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.ceinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

WEST POND PLAN AND SECTIONS

DWG NO: 12-30110-27-A

SCALE: 1"=50'	CIVIL ENGINEERING
DR:	
CH:	
SUP:	
ENG:	
DATE:	

APPROVED BY:

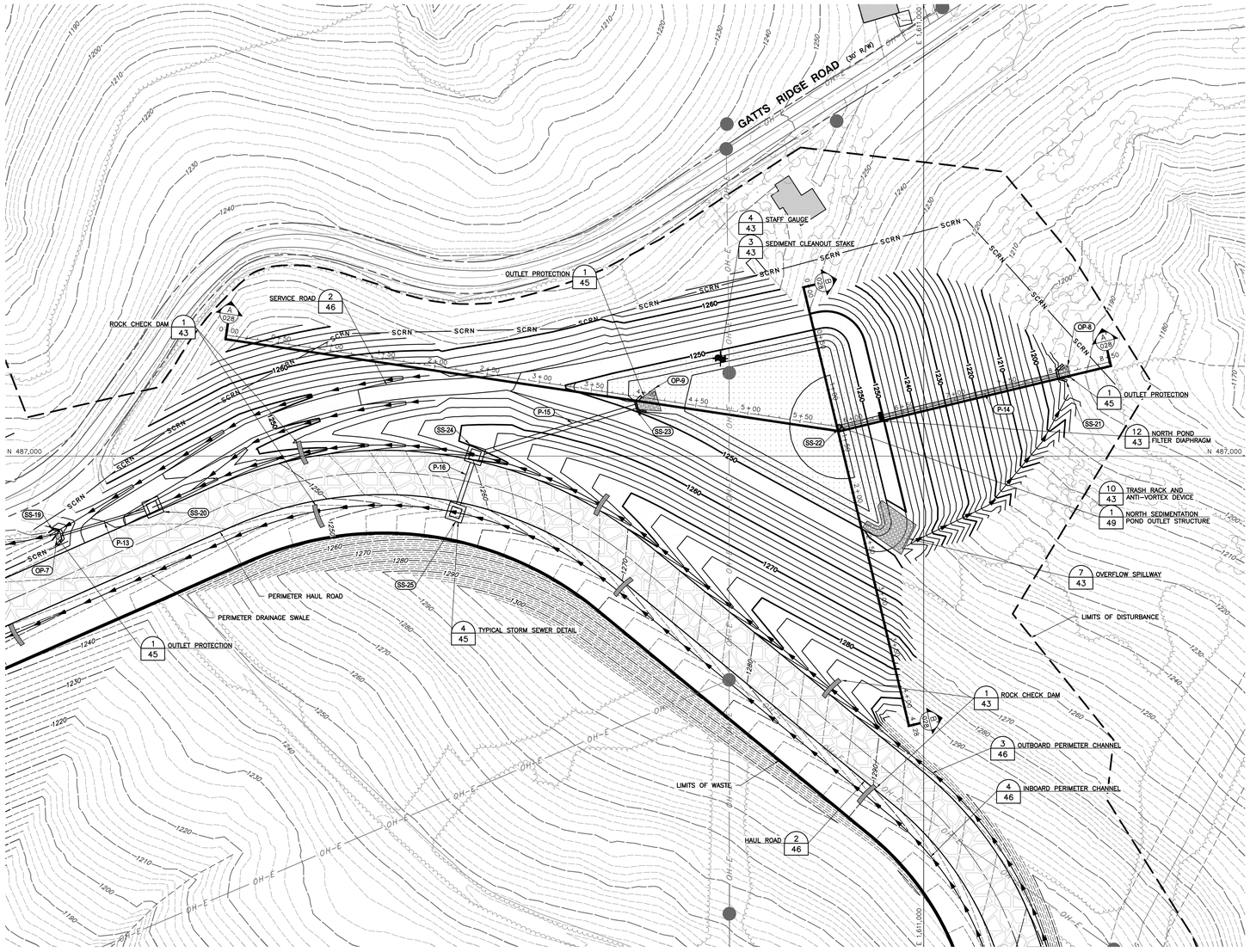
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-MAR-2013
PLOT BY: ANTHONY AMICON
BYU:USERPLOT

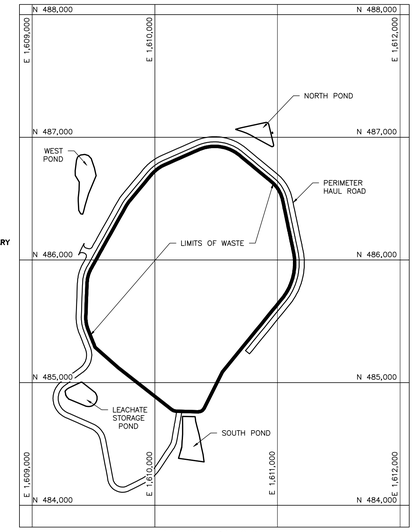
IGS0506

DWG NO: 12-30110-28-A



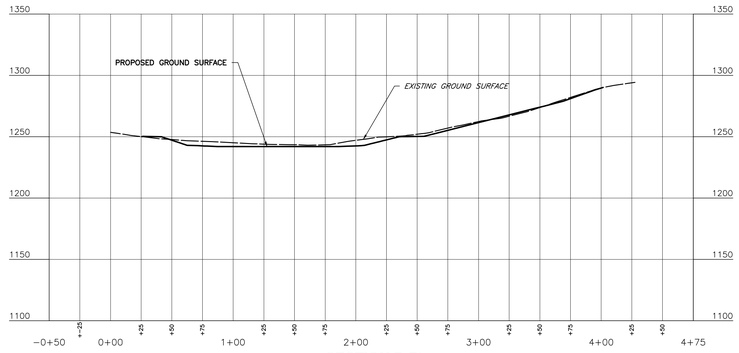
LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH-E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- SCRN SCREENING
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- PROPOSED RIP RAP
- PROPOSED ROCK CHECK DAM
- C 20 CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER
- SS-# PROPOSED STORM FEATURE NAME
- STAFF GAUGE



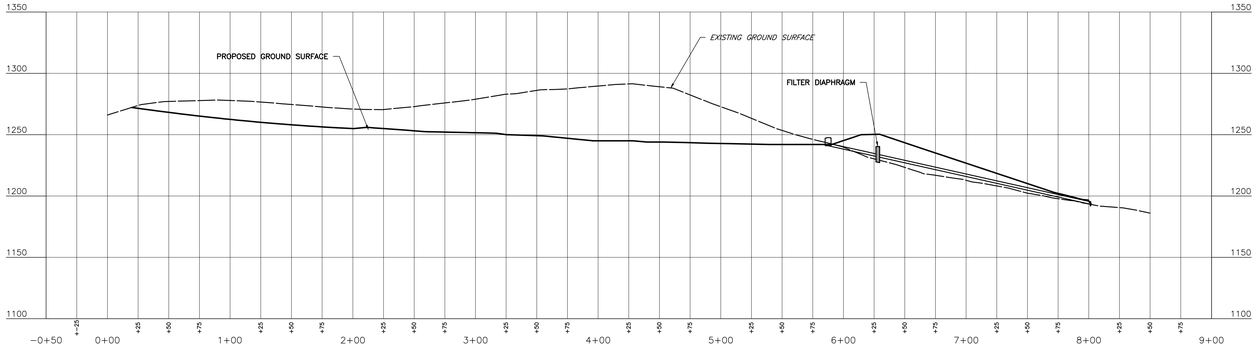
KEY PLAN

N.T.S.



SECTION B-B'

SCALE H:1"=50'; V:1"=50'



SECTION A-A'

SCALE H:1"=50'; V:1"=50'

NORTH POND		
NAME	VOLUME (CU FT)	ELEVATION (FT)
SEDIMENTATION	27,503	1244.48
CLEANOUT	16,502	1243.70
2-YEAR RUNOFF	57,014	1247.57
PRINCIPAL SPILLWAY	84,517	1247.57
10-YEAR RUNOFF	62,587	1247.80
EMERGENCY SPILLWAY		1248.50
25-YEAR RUNOFF	68,293	1248.06
100-YEAR RUNOFF	77,291	1248.43
TOP OF BERM*	144,449	1250.00

* TOTAL VOLUME OF POND INCLUDING SEDIMENT AND STORMWATER STORAGE.

NOTES:

1. SEE DRAWING 12-30110-45 FOR STORM AND DRAINAGE DETAILS.
2. SEE DRAWING 12-30110-49 FOR POND DETAILS.
3. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.
4. ADD 1-FT OF MARKER STONE ON BOTTOM AND SIDE SLOPES OF POND. GRADING SHOWN IN THE POND REPRESENTS THE TOP OF THE MARKER STONE. OVER-EXCAVATION WILL BE NECESSARY IN THE POND TO INSTALL LINER AND MARKER STONE (SEE DETAIL 3/49).
5. THE NEED FOR A LINER SYSTEM AND THE COMPONENTS OF THE LINER SYSTEM WILL BE DETERMINED IN THE FIELD BY THE ENGINEER AFTER EXCAVATION OF THE POND HAS BEEN COMPLETED.

NORTH

0 50 100

HORZ. SCALE: 1"=50'

VERT. SCALE: 1"=50' 0 50 100

CONTOUR INTERVAL = 2 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

NORTH POND PLAN AND SECTIONS

DWG NO: 12-30110-28-A

SCALE: 1"=50' | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.ceciinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

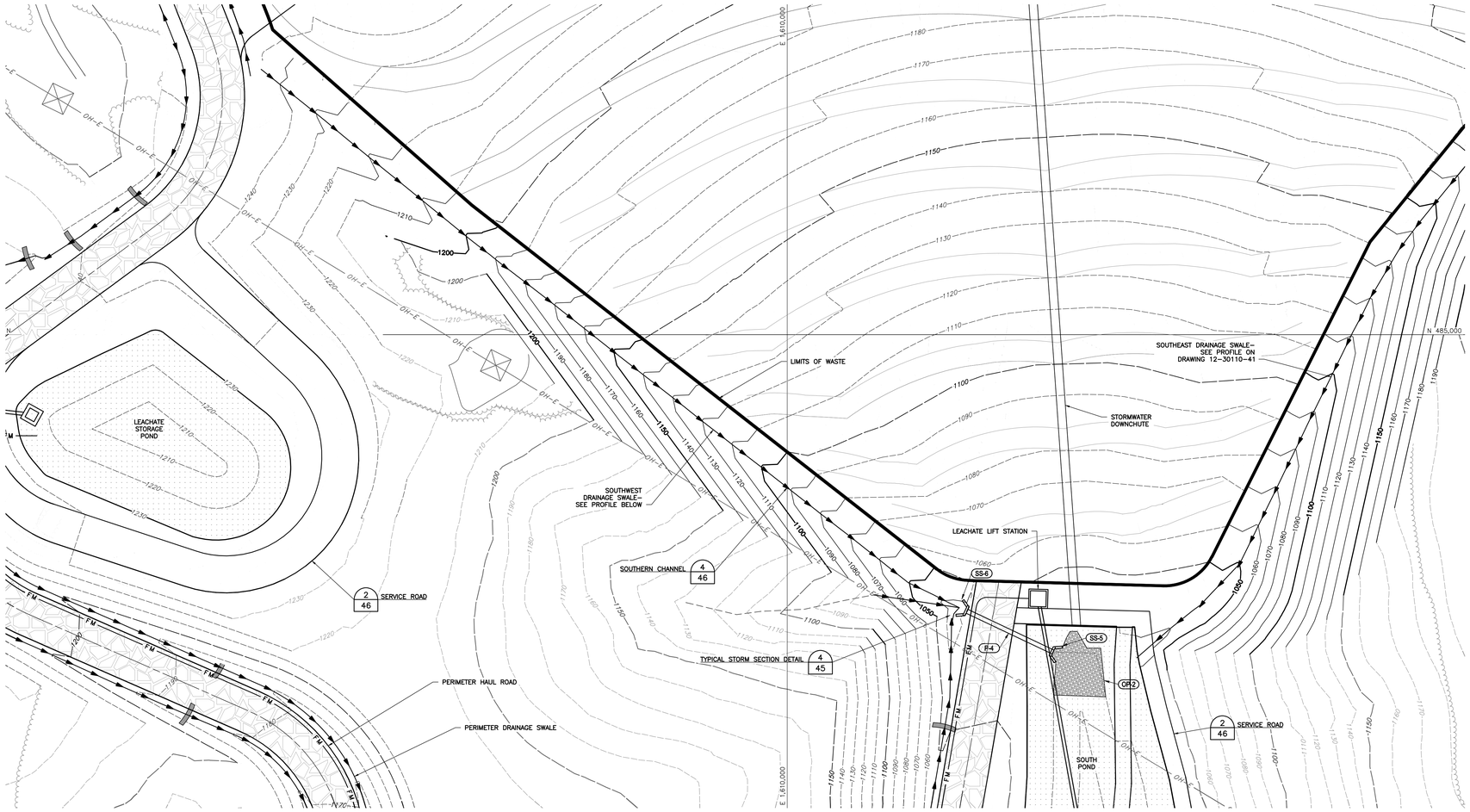
AEP AMERICAN ELECTRIC POWER

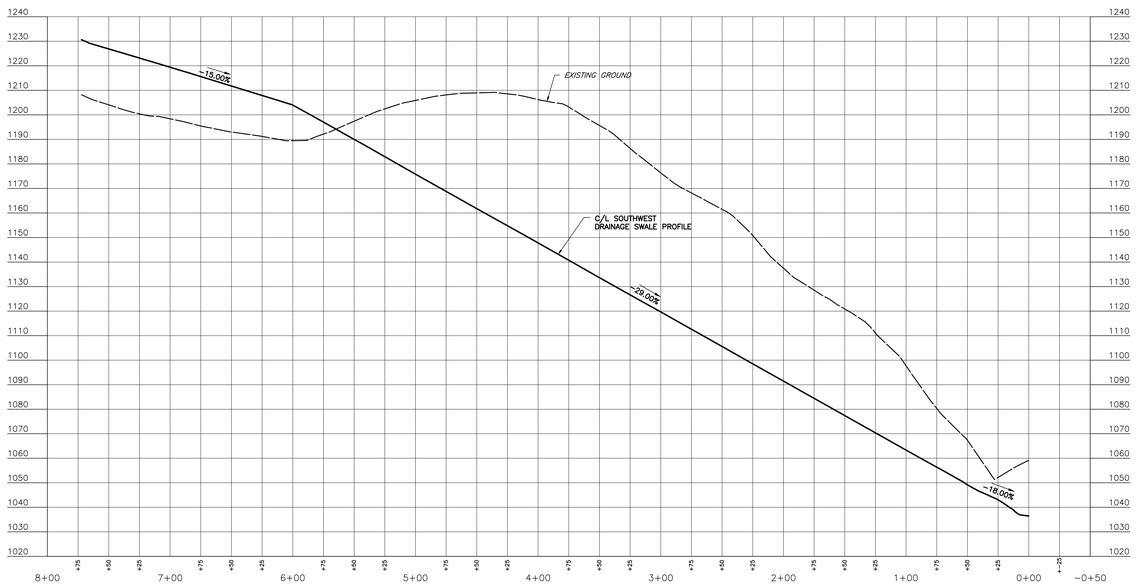
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 10-JUNE-12
PLOT TIME: 09:44:16
BY: USERPLOT

IGS0506

DWG NO: 12-30110-40-A





SOUTHWEST DRAINAGE SWALE PROFILE

SCALE H:1"=50'; V:1"=25'

LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- 580 EXISTING CONTOURS
- EXISTING STREAM
- G EXISTING GAS PIPELINE
- OH–E EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- 580 PROPOSED CONTOUR
- 580 PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- PROPOSED RIP RAP
- PROPOSED ROCK CHECK DAM
- FM PROPOSED LEACHATE FORCE MAIN

NOTES:

1. SEE DRAWING 12-30110-45 FOR STORM AND DRAINAGE DETAILS.
2. SEE DRAWING 12-30110-50 FOR POND DETAILS.
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4. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.

NORTH

0 50 100 HORZ. SCALE: 1"=50'

0 25 50 VERT. SCALE: 1"=25'

CONTOUR INTERVAL = 10 FEET

ANTHONY F. AMICO REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

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Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
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DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO.:	110-416

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

SOUTHWEST DRAINAGE SWALE PLAN AND PROFILE

DWG NO: 12-30110-40-A

SCALE: 1"=50'	CIVIL ENGINEERING
DR:	APPROVED BY:
CH:	
SUP:	
ENG:	
DATE:	

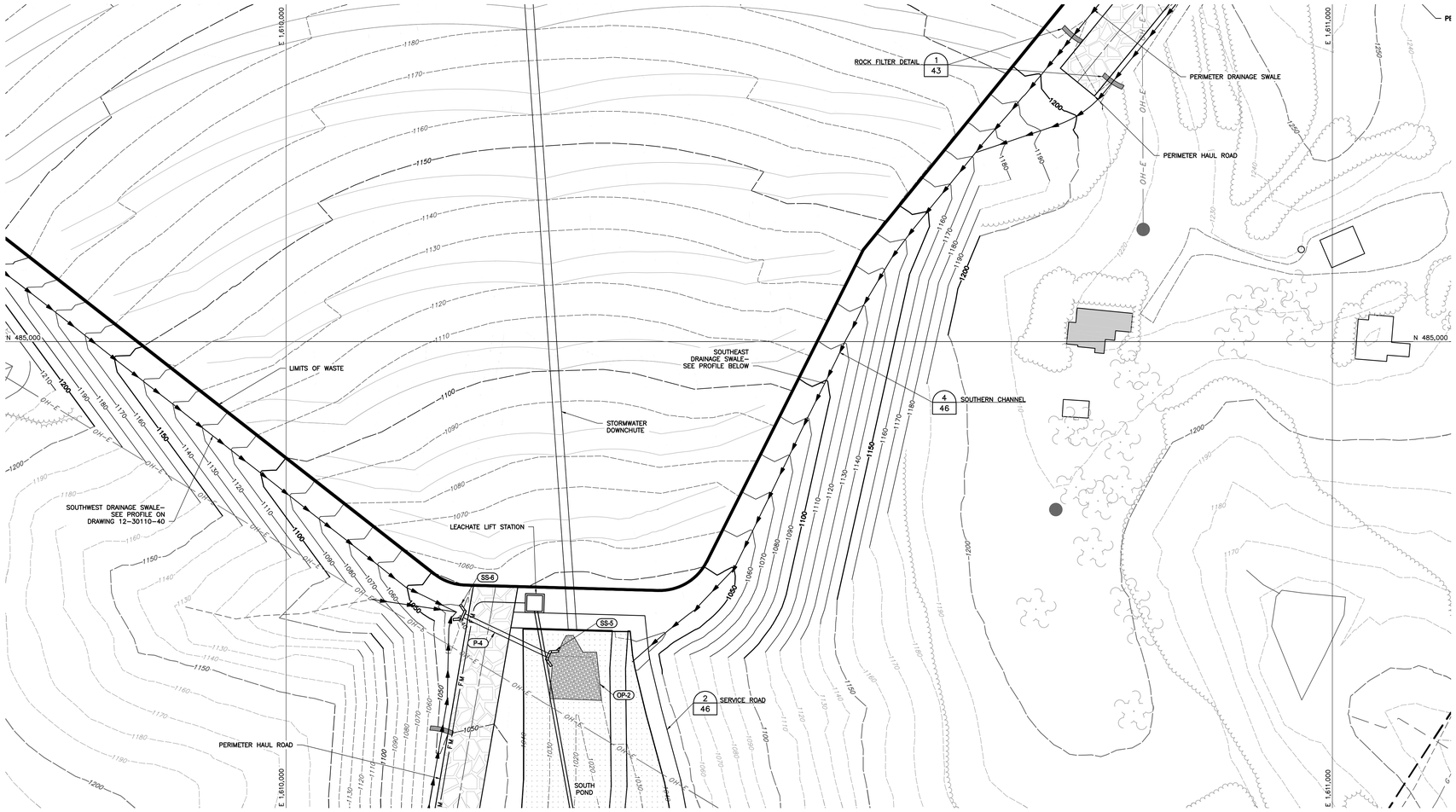
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-30-2012 4:37:17 PM
PLOTTED BY: DUDEK, CJT

IGS0506

DWG NO: 12-30110-41-A

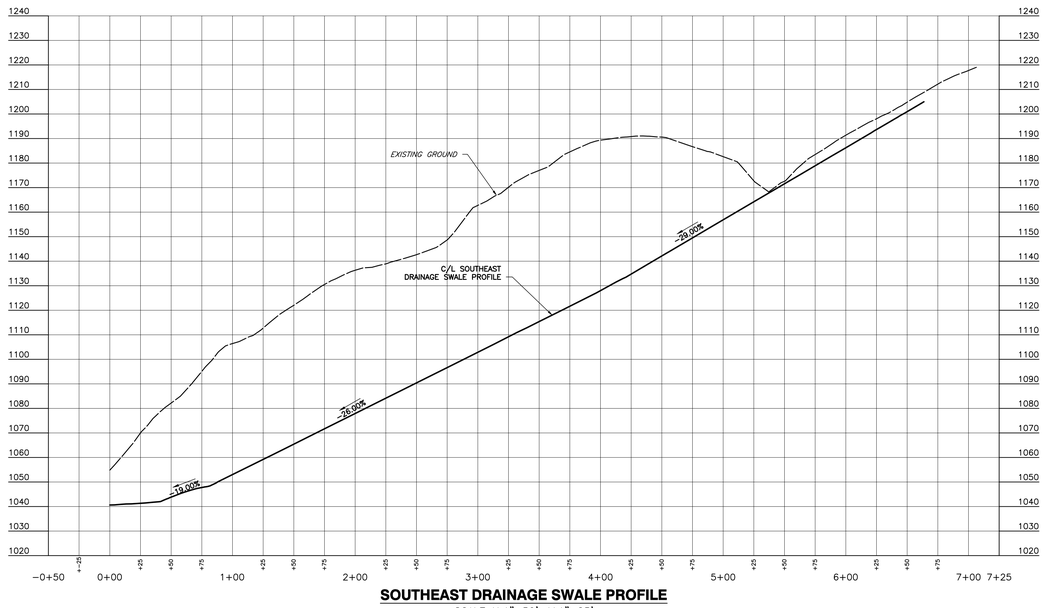


LEGEND

- FACILITY BOUNDARY (AEP OWNED)
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- EXISTING CONTOURS
- EXISTING STREAM
- EXISTING GAS PIPELINE
- EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- EXISTING STRUCTURE
- EXISTING OCCUPIED DWELLING
- MAXIMUM LIMITS OF DISTURBANCE/SITE BOUNDARY
- LIMITS OF WASTE
- PROPOSED CONTOUR
- PREVIOUSLY CONSTRUCTED CONTOUR
- PERIMETER DRAINAGE SWALE
- PROPOSED WATER SURFACE
- PROPOSED HAUL ROAD
- PROPOSED RIP RAP
- PROPOSED ROCK CHECK DAM
- PROPOSED LEACHATE FORCE MAIN

NOTES:

1. SEE DRAWING 12-30110-45 FOR STORM AND DRAINAGE DETAILS.
2. SEE DRAWING 12-30110-50 FOR POND DETAILS.
3. HILLSIDE EXCAVATIONS WILL BE TYPICALLY IN ROCK WITH SOME SOIL EXCAVATION. EXCAVATIONS IN SOIL SHALL BE AT A MAXIMUM 2H:1V. EXCAVATION IN ROCK SHALL BE AT A MAXIMUM 1H:2V, DEPENDING ON ROCK QUALITY AND CONDITION. THE STEEPNESS OF ROCK CUTS SHALL BE DETERMINED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER. FOR LAYOUT PURPOSES, HILLSIDE CUTS ARE SHOWN AS 1H:1V.
4. THE HAUL ROADS AS DEPICTED ON THESE DRAWINGS PROVIDE TWO-WAY TRAFFIC FOR VEHICLES OPERATING ON THE MITCHELL LANDFILL SITE. THE OWNER MAY CHOOSE TO CONSTRUCT ROAD BASE AND PAVEMENT FOR A SINGLE LANE OF ON-SITE TRAFFIC WITH APPROPRIATE PULL-OFFS TO FACILITATE TWO-WAY VEHICLE FLOW. CONSTRUCTION OF THE SINGLE LANE ROADWAY WILL CORRESPONDINGLY REDUCE THE LIMITS OF EXCAVATION.



SOUTHEAST DRAINAGE SWALE PROFILE
SCALE H:1"=50'; V:1"=25'

NORTH
0 50 100
HORZ. SCALE: 1"= 50'
CONTOUR INTERVAL = 10 FEET
0 25 50
VERT. SCALE: 1"= 25'

ANTHONY P. AMICON — REGISTERED — 19208 — STATE OF WEST VIRGINIA — PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APP'D
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

SOUTHEAST DRAINAGE SWALE PLAN AND PROFILE

DWG NO: 12-30110-41-A

SCALE: 1"=50'	CIVIL ENGINEERING
DR:	APPROVED BY:
CH:	
SUP:	
ENG:	
DATE:	

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

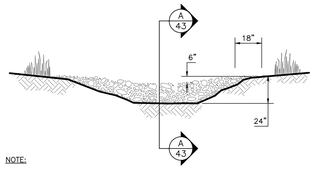
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 10-JAN-13 PLOTTED BY: USERPLOT
PLOT TIME: 11:07:AM
BY: USERPLOT

IGS0506

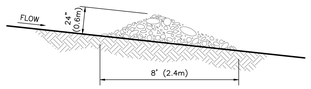
DWG NO: 12-3011-43-A



NOTE:

1. ROCK CHECK DAMS TO BE CONSTRUCTED IN ACCORDANCE WITH THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BMP MANUAL.
2. KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND DAM.

VIEW LOOKING UPSTREAM

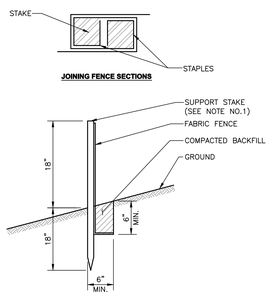


A 4.3 **SECTION**

NOTE:

SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.

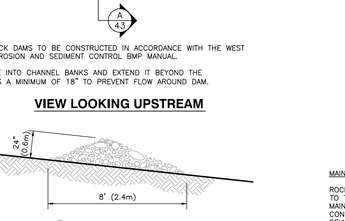
1 / 4.3 **ROCK CHECK DAM**
N.T.S.

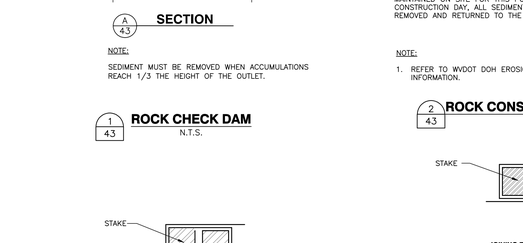


NOTES:

1. * STAKES SPACED @ 8' MAXIMUM. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
3. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. ANY SECTION OF FILTER FABRIC FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE RACK FILTER DETAIL.
5. STANDARD FILTER FABRIC FENCE TO BE CONSTRUCTED IN ACCORDANCE WITH THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BMP MANUAL.

5 / 043 **STANDARD FILTER FABRIC FENCE (18" HIGH)**
N.T.S.

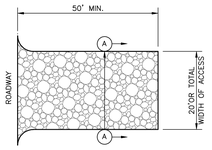




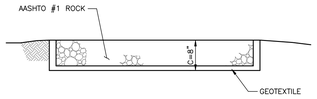
NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER,AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 12" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
6. EROSION CONTROL BLANKETS SHALL BE INSTALLED ON ALL 3:1 OR STEEPER SLOPES WITH A MINIMUM OF 6 INCHES OF TOPSOIL.

8 / 43 **EROSION CONTROL BLANKET**
N.T.S.



PLAN VIEW



SECTION A-A

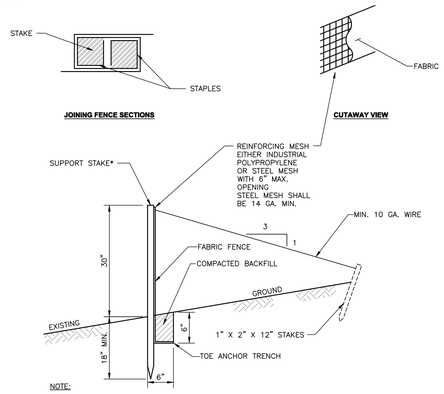
MAINTENANCE:

ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE.

NOTE:

1. REFER TO WVDOT DOH EROSION AND SEDIMENT CONTROL MANUAL FOR MORE INFORMATION.

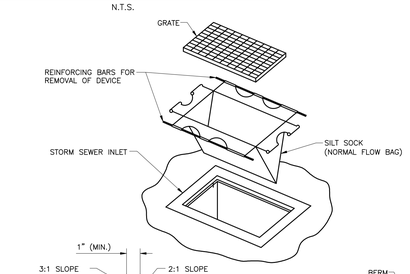
2 / 43 **ROCK CONSTRUCTION ENTRANCE**
N.T.S.

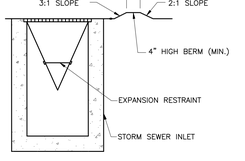


NOTE:

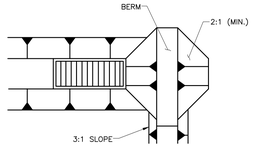
1. SHOW ALL DETAILS AND CONSTRUCTION DIMENSIONS ON PLAN DRAWINGS.
2. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
3. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE ROCK FILTER DETAIL.
5. REINFORCED FILTER FABRIC FENCE TO BE CONSTRUCTED IN ACCORDANCE WITH THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BMP MANUAL.
6. STAKES SPACED @ 8' MAX. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.

6 / 43 **REINFORCED FILTER FABRIC FENCE (30" HIGH)**
N.T.S.





ELEVATION VIEW



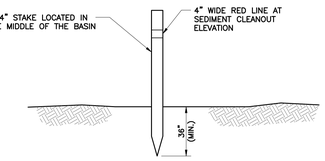
PLAN VIEW

NOTES:

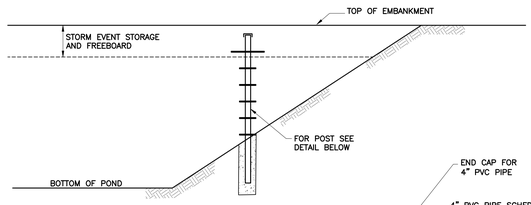
1. THE CONTRACTOR SHALL INSTALL NORMAL FLOW BAGS WHERE SILT SOCKS ARE USED FOR INLET PROTECTION.
2. THE SILT SOCKS SHALL BE THE PRODUCTS DANDY BAG, SILTSACK, OR EQUIVALENT.
3. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR TO REMAIN PERMANENTLY.
4. DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

9 / 43 **INLET PROTECTION**
N.T.S.

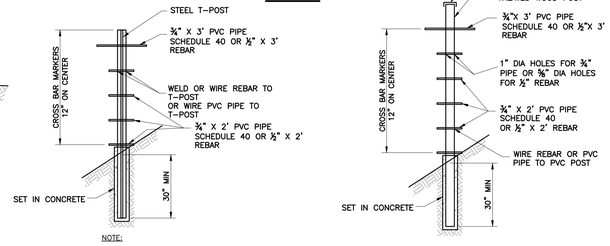
SEDIMENT CLEANOUT	
NAME	ELEVATION (FT)
SOUTH POND	1026.70
WEST POND	1193.93
NORTH POND	1243.70
LEACHATE POND	1214.50



3 / 43 **SEDIMENT CLEANOUT STAKE**
N.T.S.



SECTION



NOTE:

1. STAFF GAUGE CAN BE FABRICATED AS ABOVE OR OBTAINED FROM BEN MEADOWS, MODEL NO. 99005, FIBERGLASS STREAM GAUGE, 4" WIDE, ENGLISH, 16-20' OR OWNER APPROVED EQUAL.
2. STAFF GAUGE LOCATED IN LEACHATE STORAGE POND SHALL NOT PENETRATE LINER. FOUNDATION TO BE PREFABRICATED PEDESTAL BASE PLATE TO SIT BETWEEN SOIL AND RIP RAP LAYER.

4 / 43 **STAFF GAUGE**
N.T.S.

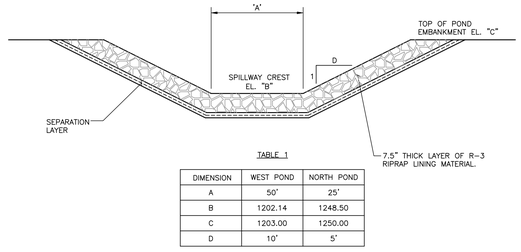
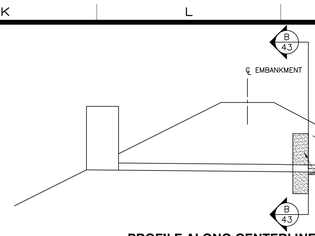


TABLE 1

DIMENSION	WEST POND	NORTH POND
A	50'	25'
B	1202.14	1248.50
C	1203.00	1250.00
D	10'	5'

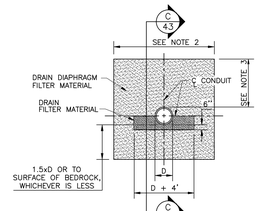
7 / 43 **OVERFLOW SPILLWAY**
NOT TO SCALE



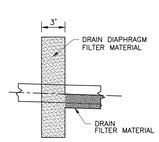
FILTER MATERIAL GRADATION	
SIEVE SIZE	% PASSING BY WEIGHT
3/8 IN.	100
NO. 4	95-100
NO. 16	45-85
NO. 50	5-30
NO. 100	0-10

ASTM, C-33 FINE AGGREGATE

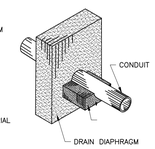
PROFILE ALONG CENTERLINE OF CONDUIT



B 4.3 **SECTION**



C 4.3 **SECTION**

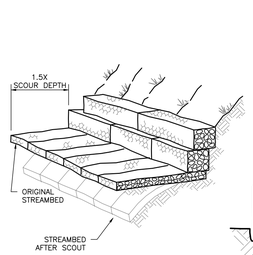


PARTIAL ISOMETRIC

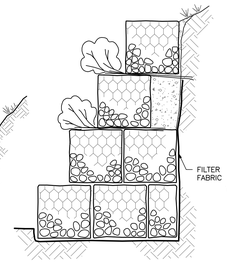
CONSTRUCTION NOTES:

1. THE FILTER MATERIAL SHALL BE PLACED IN 12 INCH LIFTS AND EACH LIFT SATURATED UNIFORMLY WITH APPROXIMATELY 1.2 GALLONS OF WATER PER CUBIC FOOT OF LOOSE FILTER MATERIAL. IN LIEU OF WATER APPLICATION, THE FILTER MATERIAL SHALL BE PLACED IN 9 INCH LIFTS AND COMPACTED WITH ONE PASS OF A PLATE VIBRATOR.
2. EXTEND FILTER DIAPHRAGM (3 X D) BEYOND LATERAL DIMENSION OF PIPE UNLESS OTHERWISE NOTED ON PLANS.
3. NORTH POND AND LEACHATE STORAGE POND = 3 x D
SOUTH POND = TO WITHIN 2-FT OF GROUND SURFACE.

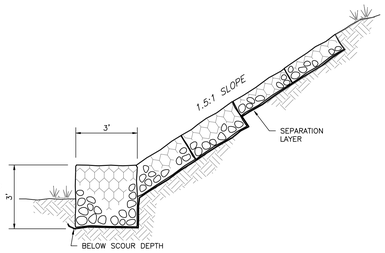
12 / 43 **FILTER DIAPHRAGM DETAIL**
N.T.S.



TYPICAL GABION APRON

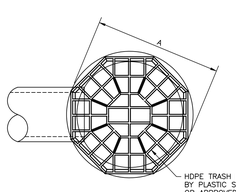


TYPICAL VEGETATED ROCK GABION

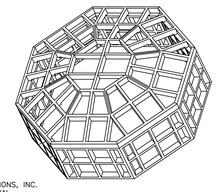


TYPICAL GABION AND GABION MATTRESS

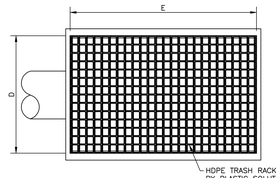
11 / 43 **GABION DETAILS**
N.T.S.



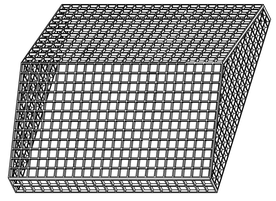
PLAN



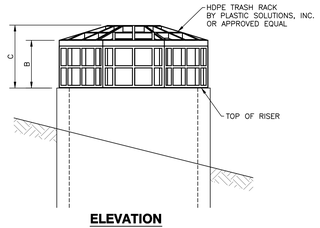
TRASH RACK ASSEMBLY



PLAN



TRASH RACK ASSEMBLY

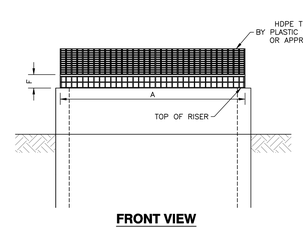


ELEVATION

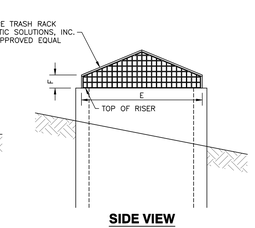
PYRAMID TYPE TRASH RACK			
RISER I.D.	A	B	C
24"	33-1/2"	15-3/4"	12-1/2"
60"	68-1/2"	20-1/2"	12-1/2"
96"	113"	39-1/2"	23"

PYRAMID TYPE TRASH RACK

NOTE:
ALL TRASH RACKS TO CONTAIN A REMOVABLE ACCESS PANEL AND CONTAIN ANTI-VORTEX DEVICE.



FRONT VIEW



SIDE VIEW

PEAK ROOF TYPE TRASH RACK			
RISER I.D.	D	E	F
4'	54-3/8"	54-3/8"	16-7/8"
13'	162-3/8"	162-3/8"	22"

PEAK ROOF TYPE TRASH RACK

NOTE:
ALL TRASH RACKS TO CONTAIN A REMOVABLE ACCESS PANEL AND CONTAIN ANTI-VORTEX DEVICE.

10 / 43 **TRASH RACK AND ANTI-VORTEX DEVICE**
N.T.S.

NOTES:

1. DETAILS STANDARD FILTER FABRIC FENCE 5/43 AND EROSION CONTROL BLANKET 8/43 TO BE USED BY CONTRACTOR AS DEEMED NECESSARY.

ANTHONY P. AMICO REGISTERED PROFESSIONAL ENGINEER 19206 STATE OF WEST VIRGINIA

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

EROSION AND SEDIMENTATION CONTROL DETAILS AND NOTES

DWG NO: 12-3011-43-A

SCALE: AS NOTED | CIVIL ENGINEERING

DR: . | CH: . | SUP: . | ENG: . | DATE: .

APPROVED BY: .

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY: DAR | CHECKED BY: JSF | APPROVED BY: APA
DATE: APRIL 2012 | DWG SCALE: AS NOTED | PROJECT NO.: 110-416

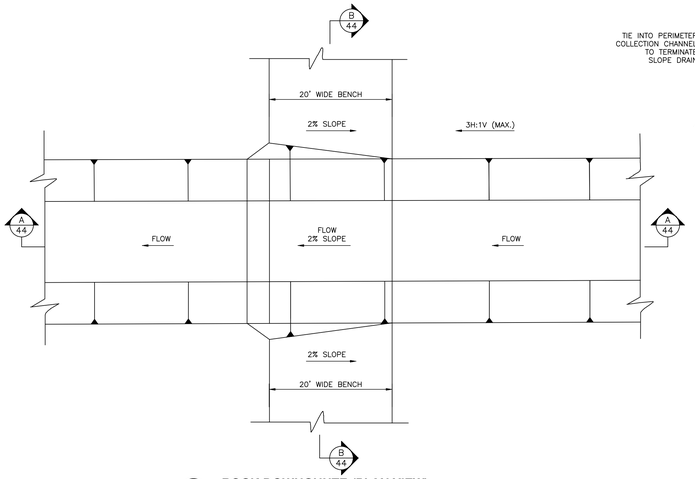
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

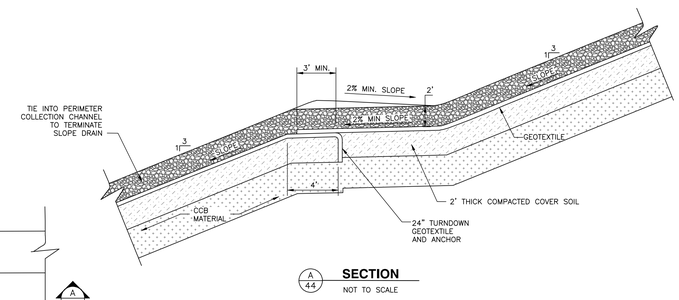
PLOT DATE: 05-DOWALTEY
PLOT TIME: 10:49:45 AM
BY: DJEIKEJOT

IGS0506

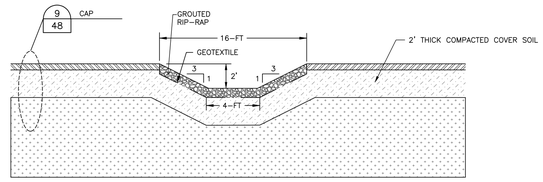
DWG NO: 12-30110-44-A



1 / 44 **ROCK DOWNCHUTE (PLAN VIEW)**
NOT TO SCALE



A / 44 **SECTION**
NOT TO SCALE



B / 44 **SECTION**
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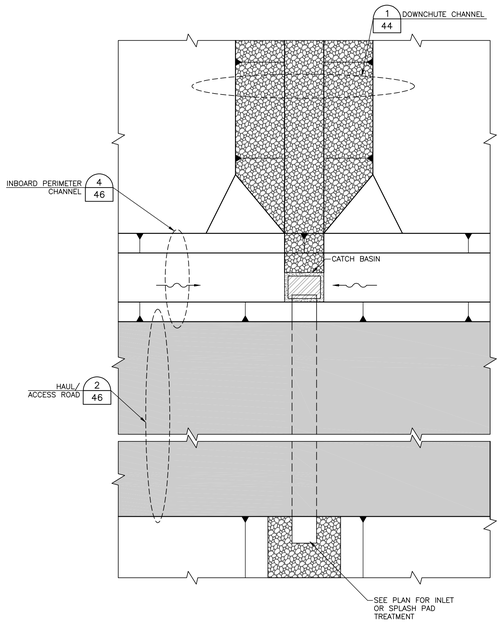
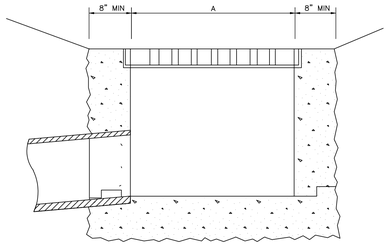


2 / 44 **DOWNCHUTE CULVERT (PLAN VIEW)**
NOT TO SCALE



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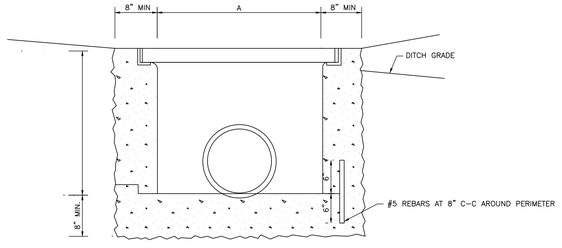

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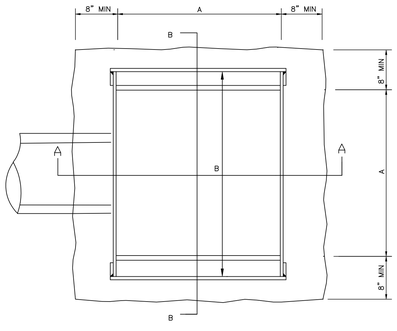
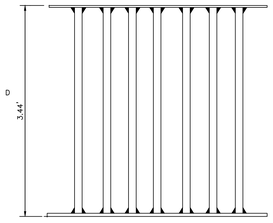
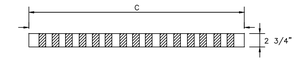
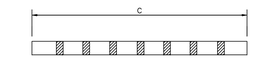


PLAN



PLAN VIEW

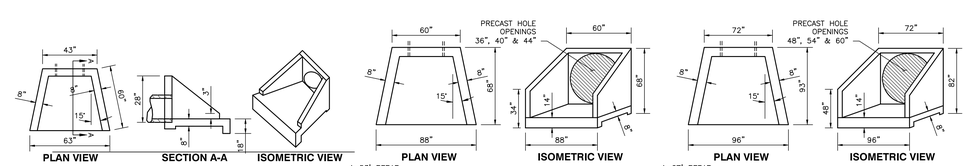


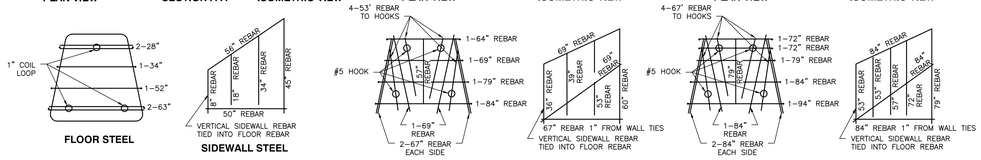


SECTION THROUGH TYPE 2 GRATE

DIMENSIONS					
PIPE SIZE	A	B	C	D	H(MIN)
18"	2'-8"	3'-2"	2'-7 3/4"	3'-1 3/4"	2'-0"
21"	2'-8"	3'-2"	2'-7 3/4"	3'-1 3/4"	2'-3"
24"	2'-8"	3'-2"	2'-7 3/4"	3'-1 3/4"	2'-6"
27"	3'-0"	3'-6"	2'-11 3/4"	3'-5 3/4"	2'-9"
30"	3'-6"	4'-0"	3'-5 3/4"	3'-11 3/4"	3'-0"
33"	3'-9"	4'-3"	3'-8 3/4"	4'-2 3/4"	3'-3"
36"	4'-0"	4'-6"	3'-11 3/4"	4'-5 3/4"	3'-6"
42"	4'-6"	5'-0"	4'-5 3/4"	4'-11 3/4"	4'-0"
48"	5'-0"	5'-6"	4'-11 3/4"	5'-5 3/4"	4'-6"

3 / 44 **CATCH BASIN**
N.T.S.





NOTES:
1. CONCRETE DESIGN STRENGTH 4,000 P.S.I. @ 28 DAYS
2. ALL REINFORCING BARS ARE #4'S
3. 3/4" CHAMFER ON ALL EXPOSED EDGES.
4. PRECAST HOLE SIZES FROM 9"-24".

HEADWALL 9"-24"

NOTES:
1. CONCRETE DESIGN STRENGTH 4,000 P.S.I. @ 28 DAYS
2. ALL REINFORCING BARS ARE #4'S
3. ALL LIFT HOOKS ARE #5'S.

HEADWALL 36"-44"

NOTES:
1. CONCRETE DESIGN STRENGTH 4,000 P.S.I. @ 28 DAYS
2. ALL REINFORCING BARS ARE #4'S
3. ALL LIFT HOOKS ARE #5'S.

HEADWALL 48"-60"

4 / 44 **REINFORCED CONCRETE HEADWALL**
NOT TO SCALE

NOTE:
1. WVDOT STANDARD PIPE CULVERT HEADWALLS AND WINGWALLS, AS DEPICTED ON STANDARD SHEET DR1 AND DR2 MAY BE USED IN LIEU OF DETAIL PROVIDED..
2. ANIMAL GUARDS TO BE PROVIDED AT ALL OUTLETS.

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

DOWNCHUTE, CATCH BASIN, AND HEADWALL DETAILS

DWG NO: 12-30110-44-A

SCALE: AS NOTED | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
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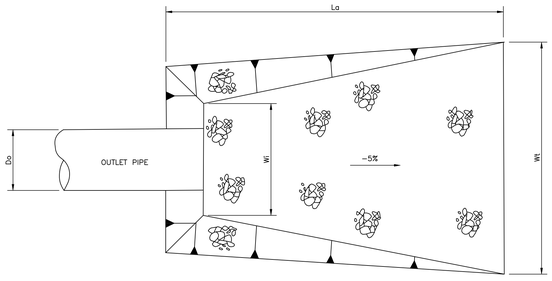
DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

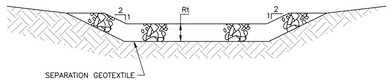
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 05-MAR-12
PLOT BY: ANNA PETTY
BYT-USERPLOT

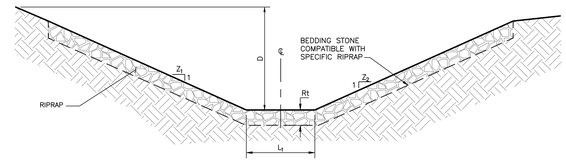
DWG NO: 12-30110-45-A



1/45 **OUTLET PROTECTION**
NOT TO SCALE



2/45 **SECTION**
NOT TO SCALE



3/45 **CHANNEL DETAILS**
NOT TO SCALE

OUTLET PROTECTION								
ID	STORM STRUCTURE	Do (IN)	Wi (FT)	Wt (FT)	La (FT)	D50	RIPRAP CLASS/ GROUTED CLASS	RT (IN)
OP-1	SS-1	48	12.0	44.0	40	18	G-7	27.0
OP-2	SS-5	42	10.5	46.5	45	24	G-8	36.0
OP-3	SS-7	36	9.0	33.0	30	15	G-6	24.0
OP-4	SS-10	36	9.0	23.0	20	9	R-5	13.5
OP-5	SS-12	24	6.0	17.0	15	6	R-4	9.0
OP-6	SS-15	42	10.5	33.5	30	15	G-6	24.0
OP-7	SS-19	12	3.0	6.0	5	6	R-4	9.0
OP-8	SS-21	24	6.0	12.0	10	6	R-4	9.0
OP-9	SS-23	30	7.5	22.5	20	6	R-4	9.0
OP-10	SS-26	36	9.0	45	42	15	R-6	24.0

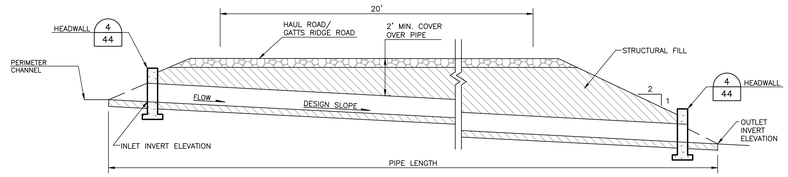
NOTE:

1. RIPRAP SIZES SPECIFIED IN THIS TABLE REPRESENT NATIONAL CRUSHED STONE ASSOCIATION RIPRAP CLASSIFICATIONS.
2. RIPRAP WITH "G" DESIGNATION IS TO BE GROUTED RIPRAP OR OTHER APPROVED HARD ARMOR EROSION CONTROL PRODUCT.
3. GROUTED RIPRAP AND/OR OTHER HARD ARMOUR EROSION CONTROL PRODUCTS WILL NOT REQUIRE BEDDING STONE.

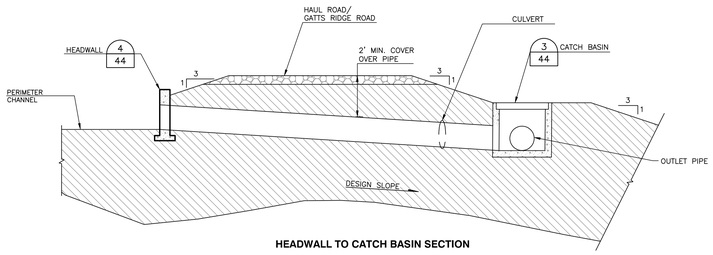
CHANNEL SCHEDULE										
CHANNEL LOCATION	DRAINAGE AREA ID	AREA (ACRES)	DESCRIPTION	DOWNSTREAM STRUCTURE ID	RIPRAP CLASS/ GROUTED CLASS	Z1	Z2	L1 (FT)	D (FT)	D50	RT (IN)
SOUTH	CH-1	9.8	SOUTHEAST CHANNEL	SOUTH POND	G-6	3	3	2	3	15	24.0
EAST	CH-2	2.4	EAST OUTBOARD CHANNEL	CH-1	R-6	1	2	2	2	15	24.0
EAST	CH-3	2.5	EAST INBOARD CHANNEL	CH-1	R-5	3	3	2	3	9	13.5
SOUTH	CH-4	6.0	SOUTHWEST CHANNEL	P-4	G-6	3	3	2	3	15	24.0
SOUTH	CH-5	6.1	SOUTH INBOARD CHANNEL	P-4	G-6	1	2	4	2	15	24.0
SOUTH	CH-6	35.7	SOUTH MIDDLE SWALE	P-4	R-7	2	1	4	4	18	27.0
SOUTH	CH-7	1.4	SOUTH OUTBOARD CHANNEL	SOUTH POND	R-5	2.5	1	2	3	9	13.5
SOUTH	CH-9	33.3	SOUTH DOWNCHUTE CHANNEL	SOUTH POND	G-6	3	3	4	2	15	24.0
NORTH	CH-10	3.8	NORTH OUTBOARD CHANNEL	P-9	R-5	2	1	2	2	9	13.5
WEST	CH-11	13.9	WEST DOWNCHUTE	P-12	G-7	3	3	4	4	18	27.0
NORTH	CH-12	1.2	NORTH OUTBOARD CHANNEL	P-15	R-4	2	1	2	2	6	9.0
NORTH	CH-13	2.7	NORTH OUTBOARD CHANNEL	P-16	R-5	3	3	2	3	9	13.5
NORTH	CH-14	3.8	NORTH DOWNCHUTE CHANNEL	P-16	G-6	3	3	4	2	15	24.0
WEST	CH-15	3.8	WEST INBOARD CHANNEL	P-12	R-4	3	3	2	3	6	9.0
WEST	CH-16	4.5	WEST INBOARD CHANNEL	P-12	R-4	3	3	2	3	6	9.0
WEST	CH-17	4.1	WEST OUTBOARD CHANNEL - SOUTH	P-11	R-3	2.5	3	2	4	3	4.5
WEST	CH-18	0.9	WEST OUTBOARD CHANNEL - NORTH	P-11	R-3	2	1	2	2	3	4.5
WEST	CH-19	27.9	WEST SWALE	WEST POND	G-6	3	3	3	2	15	24.0

NOTE:

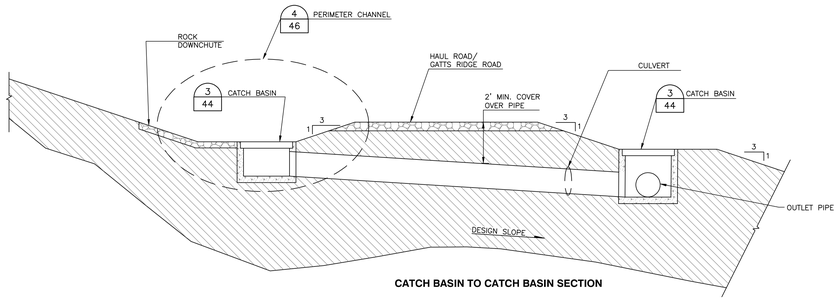
1. RIPRAP SIZES SPECIFIED IN THIS TABLE REPRESENT NATIONAL CRUSHED STONE ASSOCIATION RIPRAP CLASSIFICATIONS.
2. RIPRAP WITH "G" DESIGNATION IS TO BE GROUTED RIPRAP OR OTHER APPROVED HARD ARMOR EROSION CONTROL PRODUCT.
3. GROUTED RIPRAP AND/OR OTHER HARD ARMOUR EROSION CONTROL PRODUCTS WILL NOT REQUIRE BEDDING STONE.



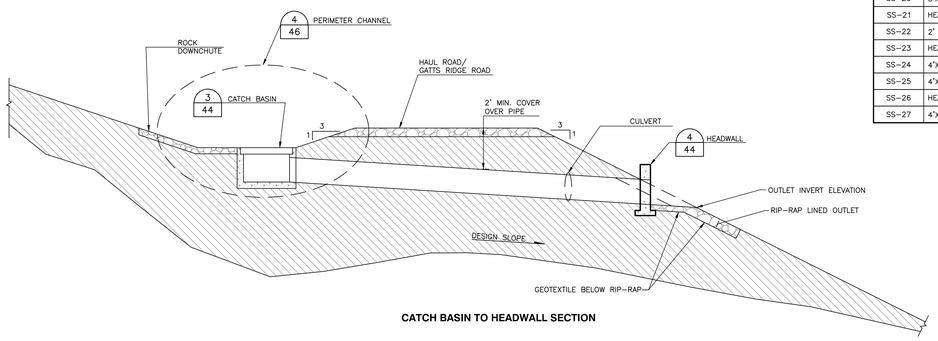
HEADWALL TO HEADWALL SECTION



HEADWALL TO CATCH BASIN SECTION



CATCH BASIN TO CATCH BASIN SECTION



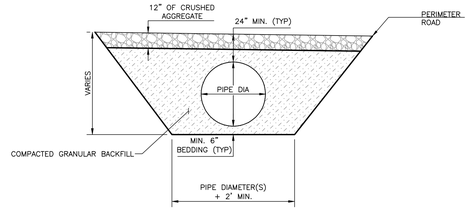
CATCH BASIN TO HEADWALL SECTION

4/45 **TYPICAL STORM SEWER DETAIL**
NOT TO SCALE

NOTE:
1. REFER TO PLAN SHEETS AND STORM STRUCTURE SCHEDULE FOR SPECIFIC END TREATMENTS.
2. THIS DETAIL SHOWS WHERE A PIPE CROSSES UNDER A ROAD.

STORM STRUCTURE SCHEDULE					
STRUCTURE NAME	STRUCTURE TYPE	RIM ELEVATION	INCOMING PIPES	OUTGOING PIPES	STRUCTURE DEPTH
SS-1	HEADWALL		P-1, 48" INV IN=867.38		
SS-2	CLEANOUT	966.71	P-2, 48" INV IN=950.71	P-1, 48" INV OUT=950.71	16.00
SS-3	13'X13' CATCH BASIN	1038.88	P-3, 48" INV IN=1015.00 P-18, 36" INV IN=1000.00	P-2, 48" INV OUT=980.00	58.88
SS-4	8' DIA. RISER	1039.88		P-3, 48" INV OUT=1016.00	23.88
SS-5	HEADWALL		P-4, 42" INV IN=1034.00		
SS-6	HEADWALL			P-4, 42" INV OUT=1036.00	
SS-7	HEADWALL		P-5, 36" INV IN=1035.33		
SS-8	CATCH BASIN	1055.04	P-6, 12" INV IN=1045.00	P-5, 36" INV OUT=1045.00	10.04
SS-9	3'X3' CATCH BASIN	1091.99		P-6, 12" INV OUT=1070.00	21.99
SS-10	HEADWALL		P-7, 36" INV IN=1185.00		
SS-11	6' DIA. RISER	1201.56		P-7, 36" INV OUT=1190.00	11.56
SS-12	HEADWALL		P-8, 24" INV IN=1214.00		
SS-13	3'X3' CATCH BASIN	1222.98	P-9, 18" INV IN=1219.00	P-8, 24" INV OUT=1218.00	4.98
SS-14	HEADWALL			P-9, 18" INV OUT=1223.90	
SS-15	HEADWALL		P-10, 42" INV IN=1215.16		
SS-16	4' X 4' CATCH BASIN	1224.50	P-12, 36" INV IN=1217.00 P-11, 18" INV IN=1218.00	P-10, 42" INV OUT=1217.00	7.50
SS-17	3'X3' CATCH BASIN	1226.53		P-11, 18" INV OUT=1220.00	6.53
SS-18	6'X6' CATCH BASIN	1224.81		P-12, 36" INV OUT=1218.00	6.81
SS-19	HEADWALL		P-13, 12" INV IN=1238.92		
SS-20	3'X3' CATCH BASIN	1244.49		P-13, 12" INV OUT=1240.00	4.49
SS-21	HEADWALL		P-14, 24" INV IN=1193.29		
SS-22	2' DIA. RISER	1247.57		P-14, 24" INV OUT=1241.00	6.57
SS-23	HEADWALL		P-15, 30" INV IN=1245.00		
SS-24	4'X4' CATCH BASIN	1258.06	P-16, 30" INV IN=1247.42	P-15, 30" INV OUT=1247.42	10.64
SS-25	4'X4' CATCH BASIN	1254.94		P-16, 30" INV OUT=1248.00	6.94
SS-26	HEADWALL			P-17, 36" INV OUT=1201.00	
SS-27	4'X4' CATCH BASIN	1229.00	P-17, 36" INV IN=1210.00		19.00

NOTE: SEE SHEETS 12-30110-27 THROUGH 12-30110-32 FOR LOCATIONS



5/45 **TYPICAL PIPE BEDDING DETAIL**
NOT TO SCALE

PIPE SCHEDULE						
CULVERT NAME	DIAMETER	PIPE MATERIAL	NO. OF BARRELS	INLET EL.	OUTLET EL.	LENGTH
P-1	48	RCP	1	950.71	867.38	257
P-2	48	RCP	1	980.00	950.71	251
P-3	48	HDPE	1	1016.00	1015.00	12
P-4	42	HDPE	2	1036.00	1034.00	92
P-5	36	HDPE	1	1045.00	1035.33	388
P-6	12	HDPE	1	1070.00	1045.00	147
P-7	36	HDPE	1	1190.00	1185.00	119
P-8	24	HDPE	1	1218.00	1214.00	183
P-9	18	HDPE	1	1223.90	1219.00	244
P-10	42	HDPE	1	1217.00	1215.16	106
P-11	18	HDPE	1	1220.00	1218.00	99
P-12	36	HDPE	1	1218.00	1217.00	68
P-13	12	HDPE	1	1240.00	1238.92	91
P-14	24	HDPE	1	1241.00	1193.29	214
P-15	30	HDPE	1	1247.42	1245.00	161
P-16	30	HDPE	1	1248.00	1247.42	57
P-17	36	HDPE	1	1201.00	1210.00	173
P-18	36	HDPE	1	1016.50	1000.00	330

NOTE: P-5 AND P-6 ARE TEMPORARY, SEE SHEET 12-30110-30-A FOR LOCATIONS

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

STORM AND DRAINAGE DETAILS

DWG NO: 12-30110-45-A

SCALE: AS NOTED | CIVIL ENGINEERING

DR: | CH: | SUP: | ENG: | DATE: | APPROVED BY:

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DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

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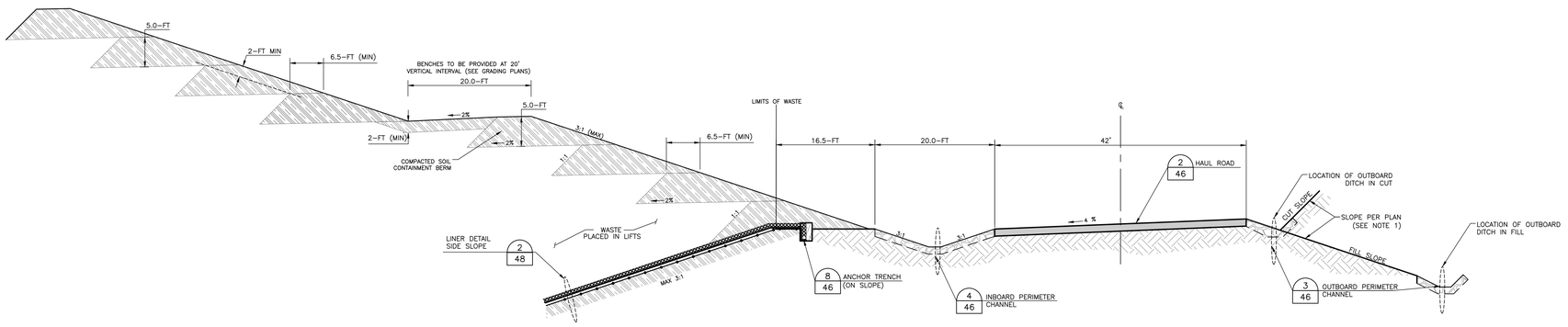
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: (SD_MINI_PLT)
PLOT BY: (APA)
BY: (DEPLOT)

IGS0506

DWG NO: 12-30110-46-A



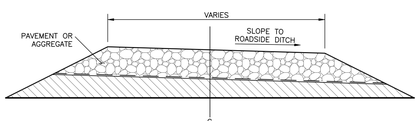
1/46 TYPICAL PERIMETER BERM SECTION
NOT TO SCALE

SYSTEM COMPONENT SUMMARY TABLE

COMPONENT NAME	SYMBOL	REQUIRED MATERIAL PROPERTY SUMMARY (SEE INDIVIDUAL DETAILS AND CQA/QC PLAN FOR DETAILED INFORMATION)
VEGETATIVE COVER		MIN. 6" ORGANIC MATERIAL
FINAL PROTECTIVE COVER		MIN. THICKNESS 24"
DRAINAGE GEOCOMPOSITE		HDPE GEONET WITH NON-WOVEN GEOTEXTILE HEAT-BONDED TO BOTH SIDES
COHESIVE SOIL		THICKNESS VARIES
WASTE MATERIAL		
PROTECTIVE COVER		MIN. THICKNESS 18"
LEACHATE COLLECTION		MIN. PERMEABILITY $1X10^{-3}$ cm/sec.
GEOTEXTILE		
FLEXIBLE MEMBRANE LINER		PVC LINER
GEOSYNTHETIC CLAY LINER (GCL)		
COMPACTED SOIL, SUBBASE AND/OR ADDED GEOLOGIC MATERAIL		-SUBBASE TO BE PREPARED PER GCL MANUFACTURER'S RECOMMENDATIONS -ADDED GEOLOGIC MATERIAL USED TO PROVIDE BEDROCK ISOLATION MUST BE A MIN OF 4 FT THICK
STRUCTURAL FILL		MIN. THICKNESS 12"
IN-SITU SOIL		
COARSE AGGREGATE		THICKNESS VARIES
BEDROCK		
ROCK CHANNEL PROTECTION		

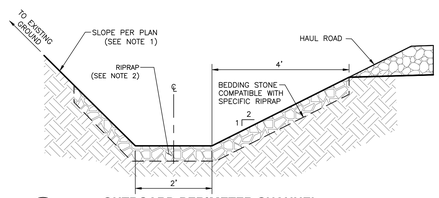
NOTES:

1. HILLSIDE EXCAVATIONS WILL BE TYPICALLY IN ROCK WITH SOME SOIL EXCAVATION. EXCAVATIONS IN SOIL SHALL BE AT A MAXIMUM 2H:1V. EXCAVATION IN ROCK SHALL BE AT A MAXIMUM 1H:2V, DEPENDING ON ROCK QUALITY AND CONDITION. THE STEEPNESS OF ROCK CUTS SHALL BE DETERMINED IN THE FIELD BY A QUALIFIED GEOTECHNICAL ENGINEER. FOR LAYOUT PURPOSES, HILLSIDE CUTS ARE SHOWN AS 1H:1V.
2. SEE RIPRAP CHANNEL SIZING CHART ON SHEET 12-30110-45 FOR RIPRAP SIZES.

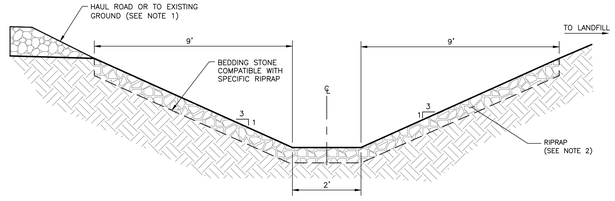


2/46 HAUL/ACCESS/SERVICE ROAD
NOT TO SCALE
(VERTICAL SCALE EXAGGERATED)

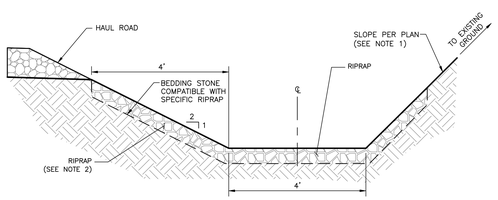
NOTE:
HAUL ROAD TO HAVE ASPHALT SURFACE OUTSIDE OF LIMITS OF WASTE AND GRAVEL SURFACE INSIDE OF LIMITS OF WASTE.



3/46 OUTBOARD PERIMETER CHANNEL
NOT TO SCALE

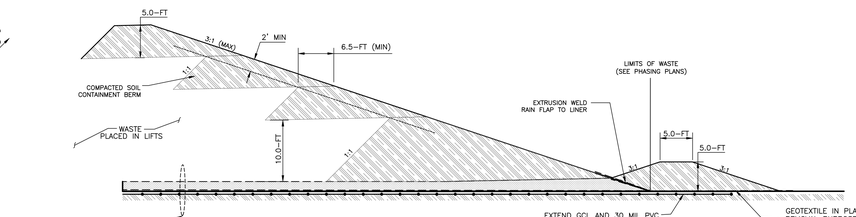


4/46 INBOARD PERIMETER CHANNEL / SOUTHERN CHANNEL
NOT TO SCALE



5/46 HAUL ROAD INSIDE DITCH
NOT TO SCALE

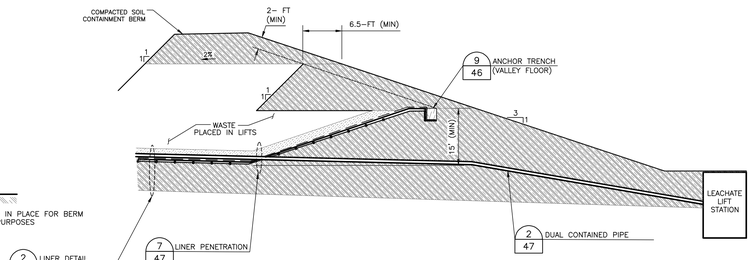
NOTE:
TRANSITION FROM HAUL ROAD INSIDE DITCH TO INSIDE PERIMETER CHANNEL BETWEEN STA. 33+51 AND 35+50.



1/48 LINER DETAIL (VALLEY FLOOR)

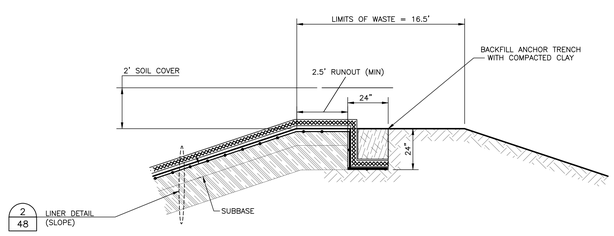
6/46 INTERIOR PHASING BERMS
SCALE: NTS

NOTE:
PIPE PENETRATION THRU RAIN FLAP TO BE PROVIDED FOR LEACHATE PIPING. SEE DETAIL 7/47.

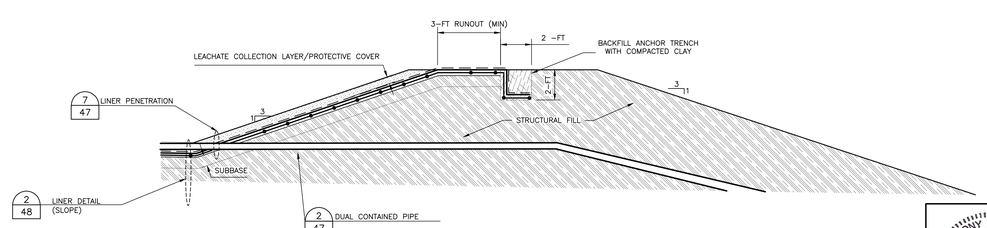


2/48 LINER DETAIL (VALLEY FLOOR)
7/47 LINER PENETRATION
2/47 DUAL CONTAINED PIPE

PERMANENT LINER TERMINATION ACROSS SOUTHERN VALLEY FLOOR
7/46
NOT TO SCALE



8/46 ANCHOR TRENCH ON SLOPE
NOT TO SCALE



9/46 ANCHOR TRENCH ON VALLEY FLOOR
NOT TO SCALE

ANTHONY P. AMICON REGISTERED PROFESSIONAL ENGINEER STATE OF WEST VIRGINIA 19208

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.ceciinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

TYPICAL PERIMETER SECTION AND LINER TERMINATION DETAILS

DWG NO: 12-30110-46-A

SCALE: AS NOTED	CIVIL ENGINEERING
DR:	APPROVED BY:
CH:	
SUP:	
ENG:	
DATE:	

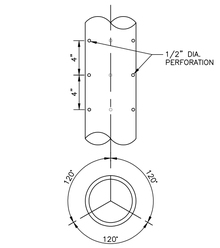
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 10-JAN-14 PLOTTED BY: BY USERPLOT

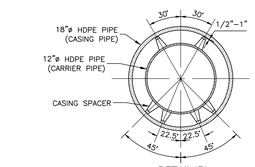
IGS0506

DWG NO: 12-30110-47-A



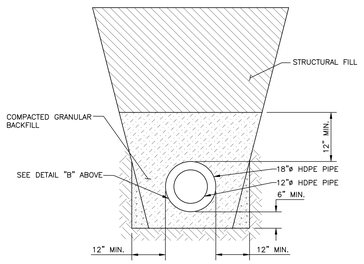
NOTE:
1. 12" DIAMETER SDR-11 HDPE PIPE

1/47 PERFORATED LEACHATE COLLECTION PIPE
NOT TO SCALE

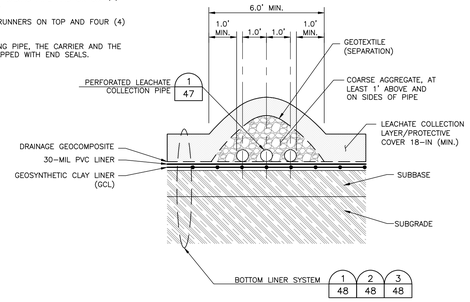


DETAIL "B"

NOTE:
1. THE CARRIER PIPE SHALL BE BRACED WITHIN THE CASING PIPE WITH CASING SPACERS THAT PLACE THE CARRIER PIPE IN A "RESTRAINED" POSITION TO PRECLUDE POSSIBLE FLOTATION WHILE PROVIDING 1/2"-1" CLEARANCE BETWEEN THE TOP RUNNERS AND THE CASING PIPE.
2. CASING SPACERS SHALL BE INSTALLED WITHIN ONE (1) FOOT OF EACH SIDE OF CARRIER PIPE JOINTS, WITHIN ONE (1) FOOT OF EACH END OF THE CASING PIPE AND ON SIX (6) FOOT CENTERS THEREAFTER.
3. THERE SHALL BE TWO (2) RUNNERS ON TOP AND FOUR (4) RUNNERS ON BOTTOM.
4. AT EACH END OF THE CASING PIPE, THE CARRIER AND THE CASING PIPE SHALL BE WRAPPED WITH END SEALS.

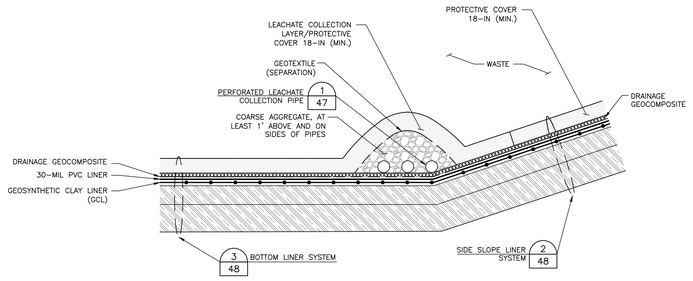


2/47 DUAL CONTAINED PIPE DETAIL
NOT TO SCALE



3/47 LEACHATE COLLECTION PIPE SECTION
NOT TO SCALE

NOTE:
1. SEE SHEET 16 FOR ACTUAL NUMBER OF LEACHATE PIPES IN EACH PHASE OF LEACHATE COLLECTION SYSTEM.
2. COARSE AGGREGATE TO BE NON-CALCAREOUS.



4/47 LEACHATE COLLECTION PIPE AT TOE OF SLOPE
NOT TO SCALE

NOTE:
1. SEE SHEET 16 FOR ACTUAL NUMBER OF LEACHATE PIPES IN EACH PHASE OF LEACHATE COLLECTION SYSTEM.
2. COARSE AGGREGATE TO BE NON-CALCAREOUS.

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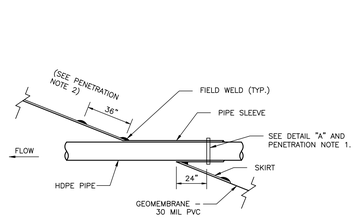
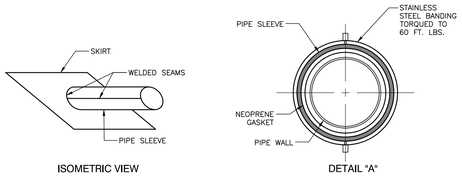
IN-SITU SOIL		
COARSE AGGREGATE		THICKNESS VARIES
BEDROCK		
ROCK CHANNEL PROTECTION		

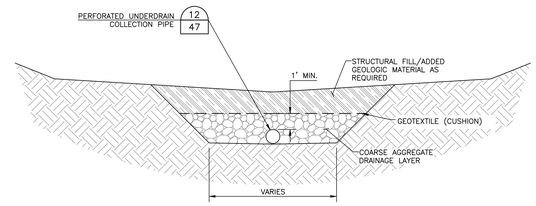
NOTES:
1. SEE RIPRAP CHANNEL SIZING CHART ON SHEET 12-30110-45 FOR RIPRAP SIZES.



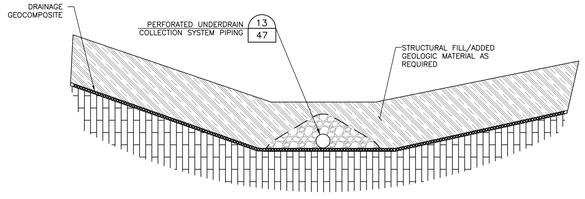
PENETRATION NOTES:
1. USE ONE STAINLESS STEEL BAND PER PIPE PENETRATION SEAL.
2. SKIRT IS TO EXTEND 36 INCHES BEYOND PIPE IN ALL DIRECTIONS.



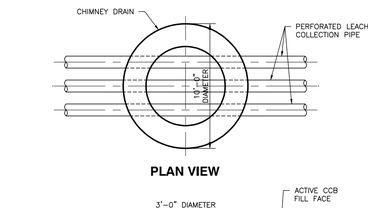
7/47 TYPICAL PIPE PENETRATION
NOT TO SCALE



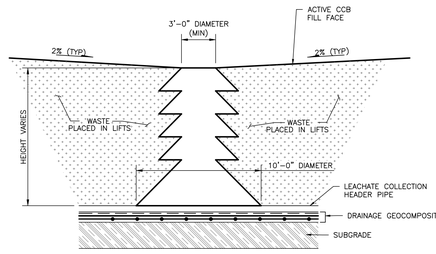
5/47 PERFORATED UNDERDRAIN COLLECTION PIPE (IN FILL)
NOT TO SCALE



11/47 PERFORATED UNDERDRAIN COLLECTION PIPE (ON DRAINAGE GEOCOMPOSITE)
NOT TO SCALE



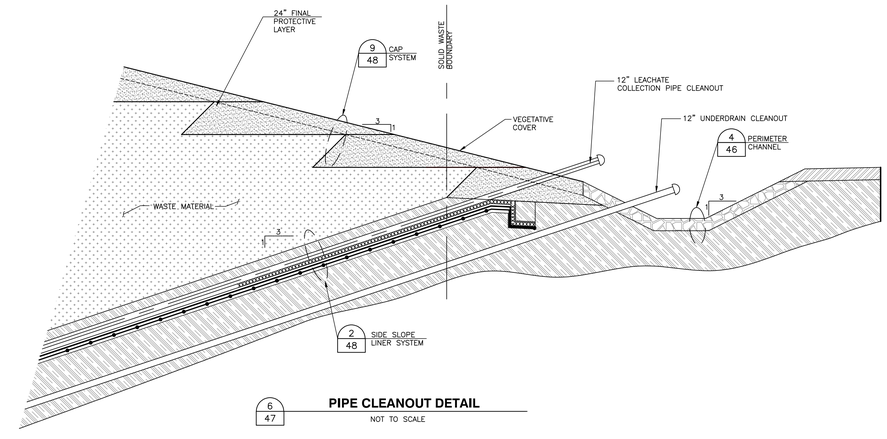
PLAN VIEW



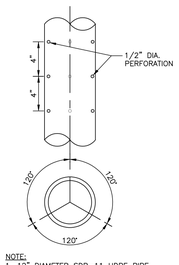
SECTION VIEW

10/47 VERTICAL CHIMNEY DRAIN
NOT TO SCALE

NOTE:
1. SEE SHEET 16 FOR ACTUAL NUMBER OF LEACHATE PIPES IN EACH PHASE OF LEACHATE COLLECTION SYSTEM.
2. COARSE AGGREGATE TO BE NON-CALCAREOUS.



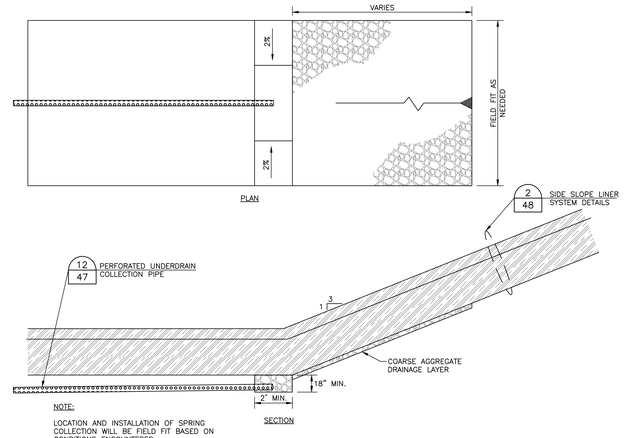
6/47 PIPE CLEANOUT DETAIL
NOT TO SCALE



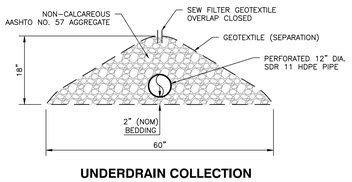
NOTE:
1. 12" DIAMETER SDR-11 HDPE PIPE

12/47 PERFORATED UNDERDRAIN COLLECTION PIPE
NOT TO SCALE

NOTE:
SIZE, NUMBER, AND EXACT LOCATION OF UNDERDRAIN PIPES TO BE DETERMINED BASED ON CONDITIONS ENCOUNTERED IN THE FIELD.



NOTE:
LOCATION AND INSTALLATION OF SPRING COLLECTION WILL BE FIELD FIT BASED ON CONDITIONS ENCOUNTERED.



13/47 UNDERDRAIN COLLECTION SYSTEM PIPING
NOT TO SCALE

14/47 SPRING COLLECTION
NOT TO SCALE

ANTHONY P. AMICO REGISTERED PROFESSIONAL ENGINEER 19206 STATE OF WEST VIRGINIA 4/16/12

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

REVISIONS
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OHIO POWER COMPANY
MITCHELL PLANT
MARSHALL COUNTY WEST VIRGINIA
MITCHELL LANDFILL

LEACHATE COLLECTION AND UNDERDRAIN DETAILS

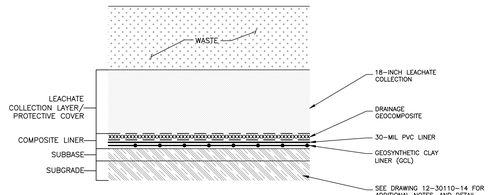
DWG NO: 12-30110-47-A

SCALE: AS NOTED	CIVIL ENGINEERING
DR: .	APPROVED BY:
CH: .	
SUP: .	
ENG: .	
DATE: .	

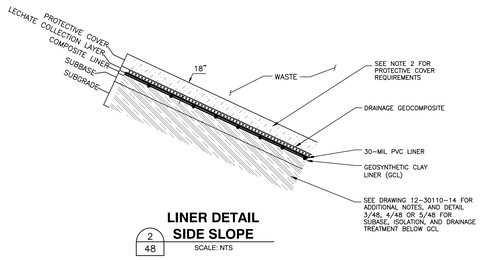
AEP AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 20-MAR-12 TY
PLOT BY: MARK E. WHITE
BY USERPLOT

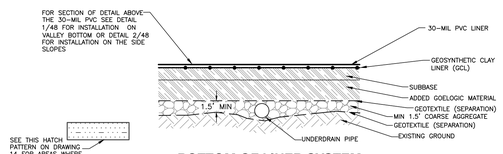
DWG NO: 12-30110-48-A



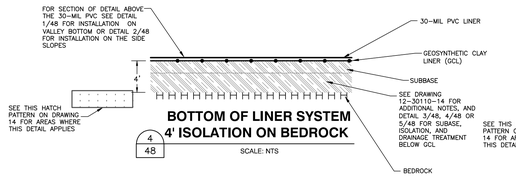
LINER DETAIL
BOTTOM OF VALLEY
1/48 — SCALE: NTS



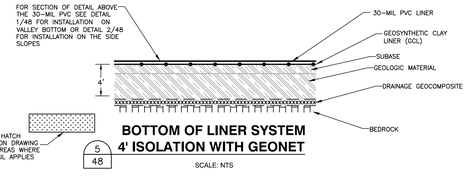
LINER DETAIL
SIDE SLOPE
2/48 — SCALE: NTS



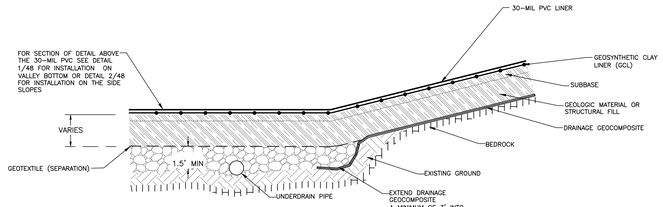
BOTTOM OF LINER SYSTEM
FILL WITH DRAINAGE BLANKET
3/48 — SCALE: NTS



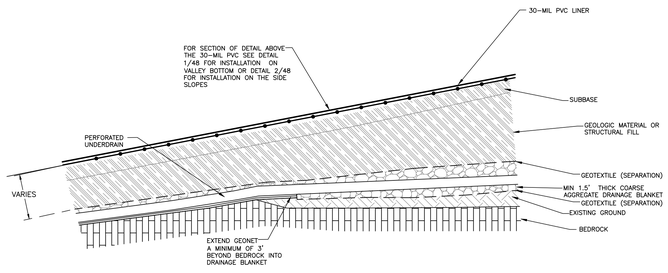
BOTTOM OF LINER SYSTEM
4' ISOLATION ON BEDROCK
4/48 — SCALE: NTS



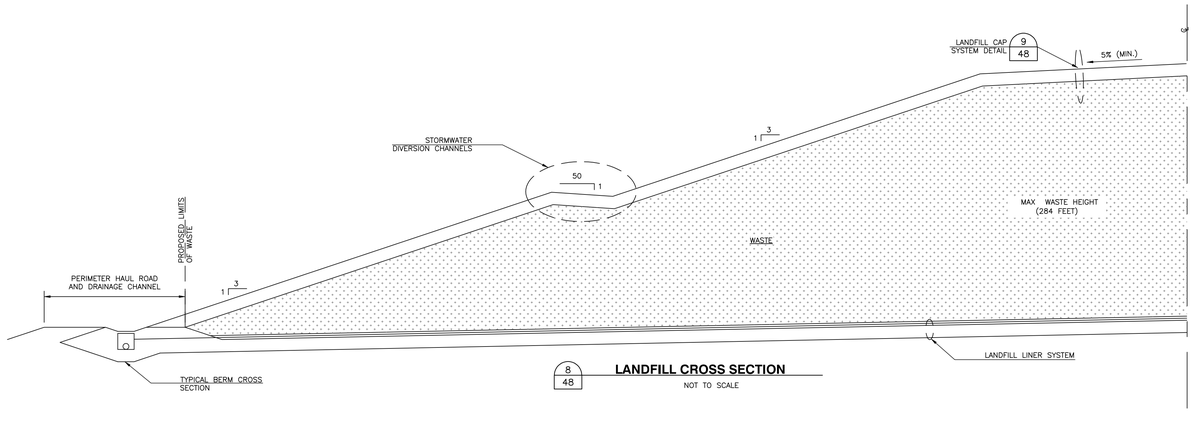
BOTTOM OF LINER SYSTEM
4' ISOLATION WITH GEONET
5/48 — SCALE: NTS



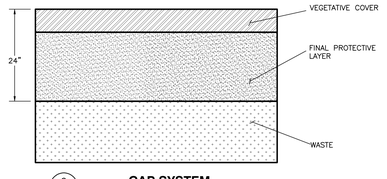
TRANSITION BETWEEN
GEONET AND DRAINAGE BLANKET
6/48 — SCALE: NTS



UNDERDRAIN TRANSITION BETWEEN
DRAINAGE BLANKET AND GEONET AREAS
7/48 — SCALE: NTS



LANDFILL CROSS SECTION
8/48 — NOT TO SCALE



CAP SYSTEM
9/48 — NOT TO SCALE

SYSTEM COMPONENT SUMMARY TABLE

COMPONENT NAME	SYMBOL	REQUIRED MATERIAL PROPERTY SUMMARY (SEE INDIVIDUAL DETAILS AND CQA/QC PLAN FOR DETAILED INFORMATION)
VEGETATIVE COVER		MIN. 6" ORGANIC MATERIAL
FINAL PROTECTIVE COVER		MIN. THICKNESS 24"
DRAINAGE GEOCOMPOSITE		HDPE GEONET WITH NON-WOVEN GEOTEXTILE HEAT-BONDED TO BOTH SIDES
COHESIVE SOIL		THICKNESS VARIES
WASTE MATERIAL		
PROTECTIVE COVER		MIN. THICKNESS 18"
LEACHATE COLLECTION		MIN. PERMEABILITY $1X10^{-3}$ cm/sec.
GEOTEXTILE		
FLEXIBLE MEMBRANE LINER		PVC LINER
GEOSYNTHETIC CLAY LINER (GCL)		
COMPACTED SOIL, SUBBASE AND/OR ADDED GEOLOGIC MATERIAL		--SUBBASE TO BE PREPARED PER GCL MANUFACTURER'S RECOMMENDATIONS --ADDED GEOLOGIC MATERIAL USED TO PROVIDE BEDROCK ISOLATION MUST BE A MIN OF 4 FT THICK
STRUCTURAL FILL		MIN. THICKNESS 12"
IN-SITU SOIL		
COARSE AGGREGATE		THICKNESS VARIES
BEDROCK		
ROCK CHANNEL PROTECTION		

NOTES:

1. LEACHATE COLLECTION LAYER/PROTECTIVE COVER FOR BOTTOM OF VALLEY LINER SHALL BE COMPRISED OF EITHER BOTTOM ASH OR NATURAL SAND HAVING A MINIMUM PERMEABILITY OF 1 X 10 $^{-3}$ CM/SEC.
2. PROTECTIVE COVER FOR SIDE SLOPE LINER SHALL BE FLY ASH, SAND, BOTTOM ASH, GYPSUM WASTE, AND/OR NATURAL MATERIAL WITH LESS THAN 10% CLAY, PROVIDED DRAINAGE GEOCOMPOSITE GEOTEXTILE PROVIDES SUFFICIENT FILTRATION FOR ALL WASTE MATERIALS.
3. GCL SUBBASE SHALL BE A MINIMUM THICKNESS OF 6 INCHES AND MEET THE RECOMMENDED MATERIAL SPECIFICATIONS OF THE GCL MANUFACTURER.
4. IN AREAS THAT REQUIRE ISOLATION, MINIMUM COMBINED THICKNESS OF GCL SUBBASE AND GEOLOGIC MATERIAL SHALL BE 4 FEET.

DATE	NO.	DESCRIPTION	APPD.
04/16/12	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

LANDFILL LINER AND CAP DETAILS

DWG NO: 12-30110-48-A

SCALE: AS NOTED | CIVIL ENGINEERING

DR: . CH: . SUP: . ENG: . DATE: .

APPROVED BY: .

ANTHONY F. AMICO — REGISTERED PROFESSIONAL ENGINEER — STATE OF WEST VIRGINIA — 19206 — 4/16/12

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

AEP AMERICAN ELECTRIC POWER

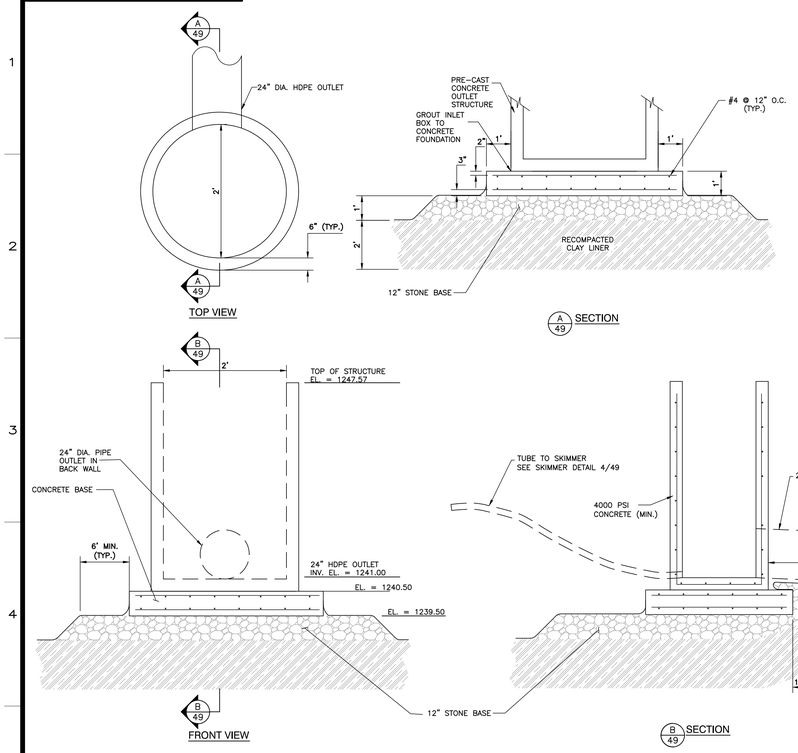
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 20-JUNE-12
PLOT TIME: 8:49:00 AM
BY: DJEBKOT

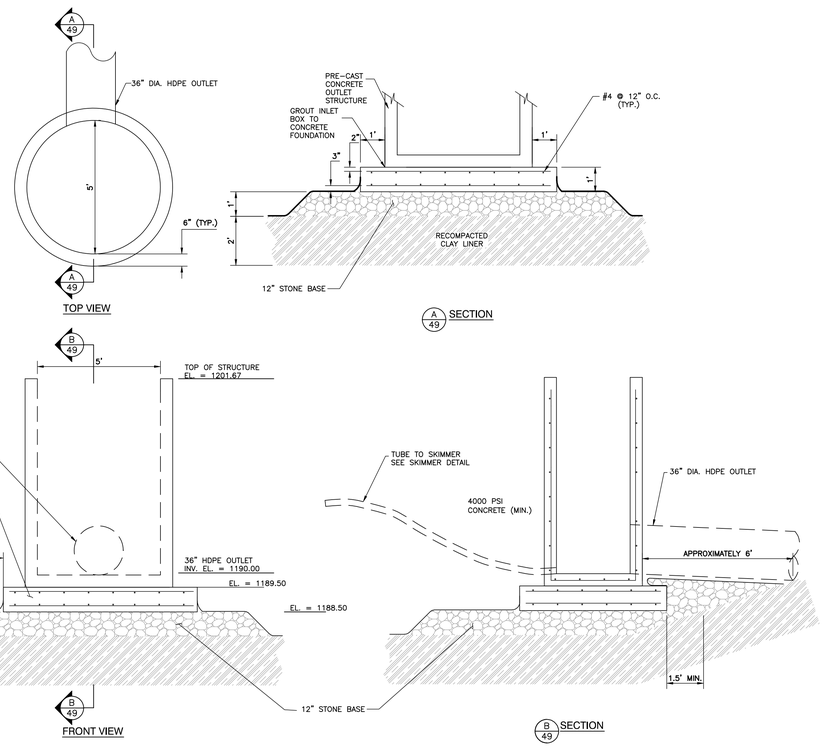
P:\2011\110-416\-CAD\DWG\FINAL SET\110416_12-30110-48-A.DWG [48 SUMMARY] ([LOPLOT - 4/13/2012 4:01:47 PM) - LP: 4/13/2012 7:16:58 PM

IGS0506

DWG NO: 12-30110-49-A



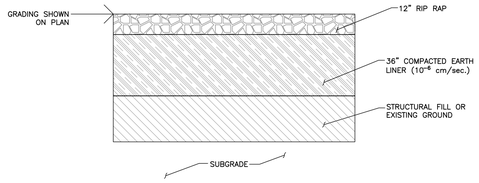
NORTH SEDIMENTATION POND OUTLET STRUCTURE
1/49 — NOT TO SCALE



WEST SEDIMENTATION POND OUTLET STRUCTURE
2/49 — NOT TO SCALE

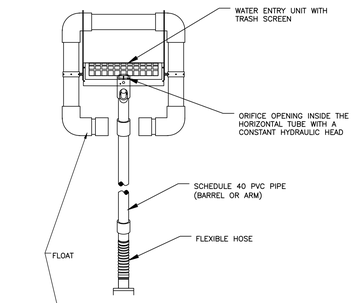
SYSTEM COMPONENT SUMMARY TABLE

COMPONENT NAME	SYMBOL	REQUIRED MATERIAL PROPERTY SUMMARY (SEE INDIVIDUAL DETAILS AND COA/QC PLAN FOR DETAILED INFORMATION)
VEGETATIVE COVER		MIN. 6" ORGANIC MATERIAL
FINAL PROTECTIVE COVER		MIN. THICKNESS 24"
DRAINAGE GEOCOMPOSITE		HDPE GEONET WITH NON-WOVEN GEOTEXTILE HEAT-BONDED TO BOTH SIDES
COHESIVE SOIL		THICKNESS VARIES
WASTE MATERIAL		
PROTECTIVE COVER		MIN. THICKNESS 18"
LEACHATE COLLECTION		MIN. PERMEABILITY $1X10^{-3}$ cm/sec.
GEOTEXTILE		
FLEXIBLE MEMBRANE LINER		PVC LINER
GEOSYNTHETIC CLAY LINER (GCL)		
COMPACTED SOIL, SUBBASE AND/OR ADDED GEOLOGIC MATERIAL		-SUBBASE TO BE PREPARED PER GCL MANUFACTURER'S RECOMMENDATIONS -ADDED GEOLOGIC MATERIAL USED TO PROVIDE BEDROCK ISOLATION MUST BE A MIN OF 4 FT THICK
STRUCTURAL FILL		MIN. THICKNESS 12"
IN-SITU SOIL		
COARSE AGGREGATE		THICKNESS VARIES
BEDROCK		
ROCK CHANNEL PROTECTION		



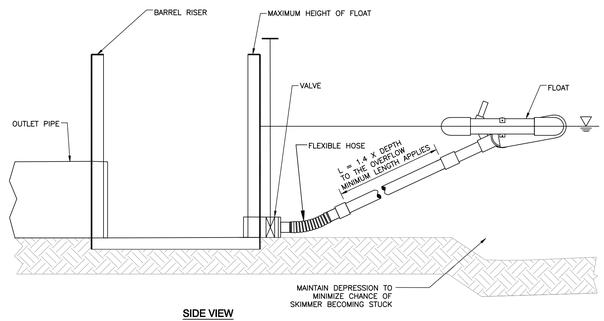
SEDIMENTATION POND LINER SYSTEM
3/49 — NOT TO SCALE

NOTE:
A LINER MAY OR MAY NOT BE NECESSARY FOR THE NORTH AND WEST PONDS. THE NEED FOR A LINER SYSTEM AND THE COMPONENTS OF THE LINER SYSTEM WILL BE DETERMINED IN THE FIELD BY THE ENGINEER AFTER EXCAVATION OF THE POND HAS BEEN COMPLETED.

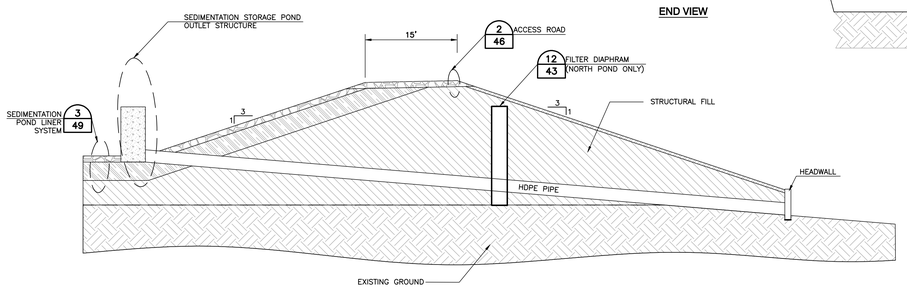


NORTH POND:
SKIMMER SIZE=3.0 INCHES
ORIFICE DIAMETER=2.8 INCHES

WEST POND:
SKIMMER SIZE=5.0 INCHES
ORIFICE DIAMETER=4.9 INCHES

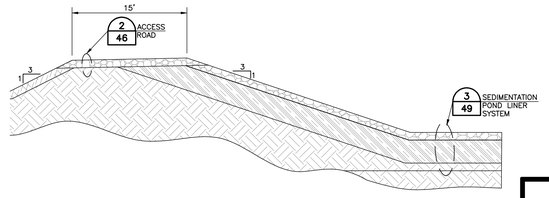


FAIRCLOTH SKIMMER
4/49 — NOT TO SCALE



PRINCIPAL SPILLWAY DETAIL
6/49 — NOT TO SCALE

NOTE: A WALKWAY WILL BE PROVIDED TO THE POND OUTLET STRUCTURE.



TYPICAL PERIMETER BERM SECTION AT WEST AND NORTH PONDS
5/49 — NOT TO SCALE

DATE	NO.	DESCRIPTION	APP'D
04/16/13	A	ISSUED FOR PERMIT	APA

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

SEDIMENTATION POND DETAILS

DWG NO: 12-30110-49-A

SCALE: AS NOTED | CIVIL ENGINEERING

DR: . | CH: . | SUP: . | ENG: . | DATE: .

APPROVED BY: .

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER 4/16/13

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4274 Glendale-Milford Road - Cincinnati, OH 45242
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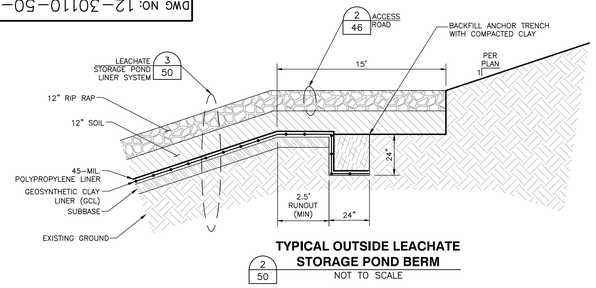
DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

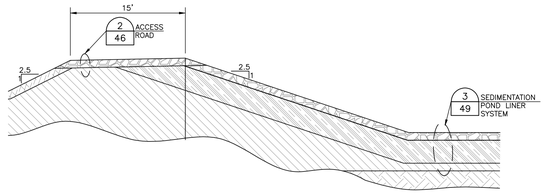
AEP AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 20-MAR-13
PLOT BY: APA
BYPLOTPLOT
IGS0506

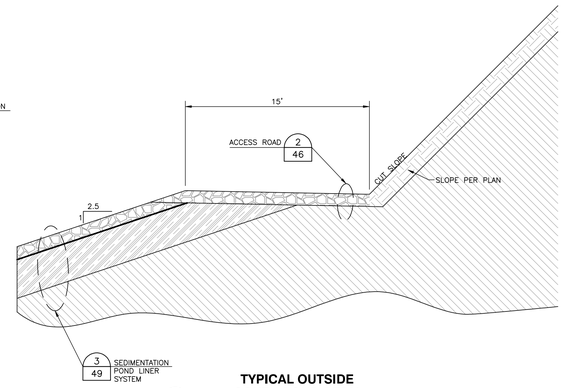
DWG NO: 12-30110-50-A



TYPICAL OUTSIDE LEACHATE STORAGE POND BERM
2/50 NOT TO SCALE



TYPICAL PERIMETER BERM SECTION AT SOUTH POND
4/50 NOT TO SCALE



TYPICAL OUTSIDE SOUTH POND BERM
5/50 NOT TO SCALE

SYSTEM COMPONENT SUMMARY TABLE		
COMPONENT NAME	SYMBOL	REQUIRED MATERIAL PROPERTY SUMMARY (SEE INDIVIDUAL DETAILS AND CQA/QC PLAN FOR DETAILED INFORMATION)
VEGETATIVE COVER		MIN. 6" ORGANIC MATERIAL
FINAL PROTECTIVE COVER		MIN. THICKNESS 24"
DRAINAGE GEOCOMPOSITE		HDPE GEONET WITH NON-WOVEN GEOTEXTILE HEAT-BONDED TO BOTH SIDES
COHESIVE SOIL		THICKNESS VARIES
WASTE MATERIAL		
PROTECTIVE COVER		MIN. THICKNESS 18"
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GEOTEXTILE		
FLEXIBLE MEMBRANE LINER		PVC LINER
GEOSYNTHETIC CLAY LINER (GCL)		
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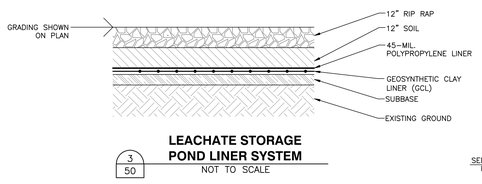
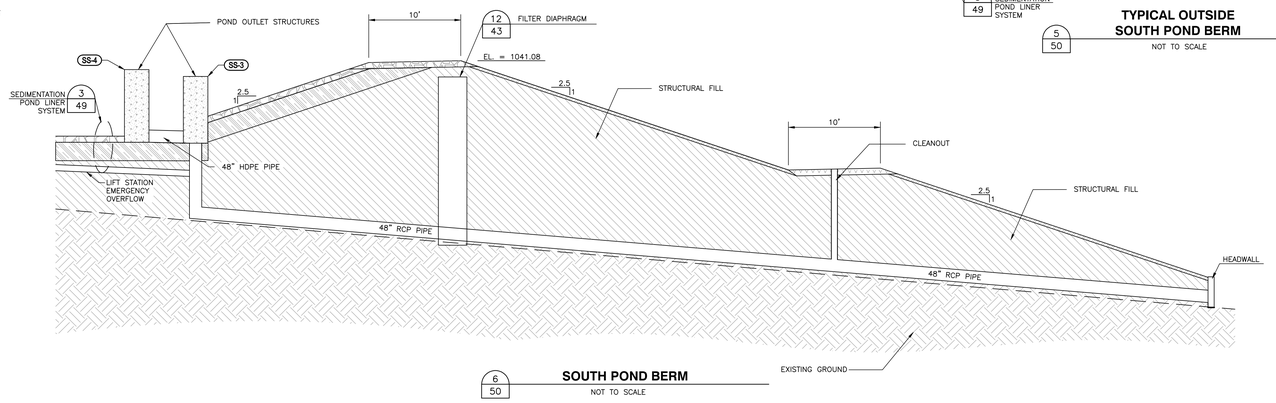
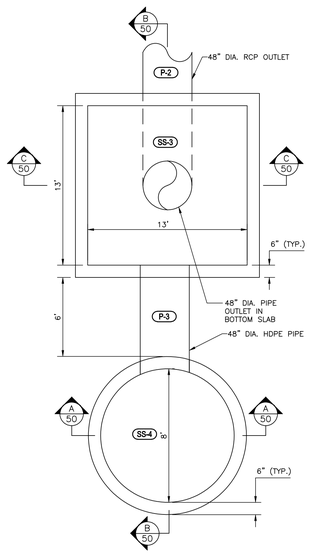
STRUCTURAL FILL		MIN. THICKNESS 12"
IN-SITU SOIL		
COARSE AGGREGATE		THICKNESS VARIES
BEDROCK		
ROCK CHANNEL PROTECTION		



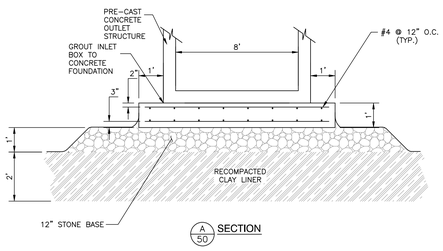
LEACHATE STORAGE POND LINER SYSTEM
3/50 NOT TO SCALE



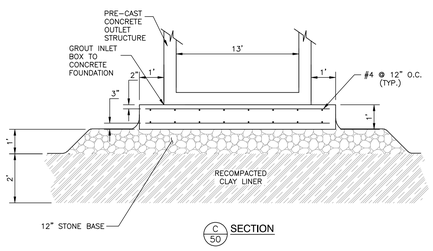
SOUTH POND BERM
6/50 NOT TO SCALE



TOP VIEW



A 50 SECTION



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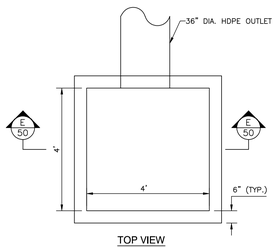
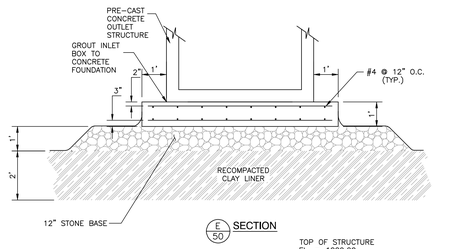


TOP VIEW



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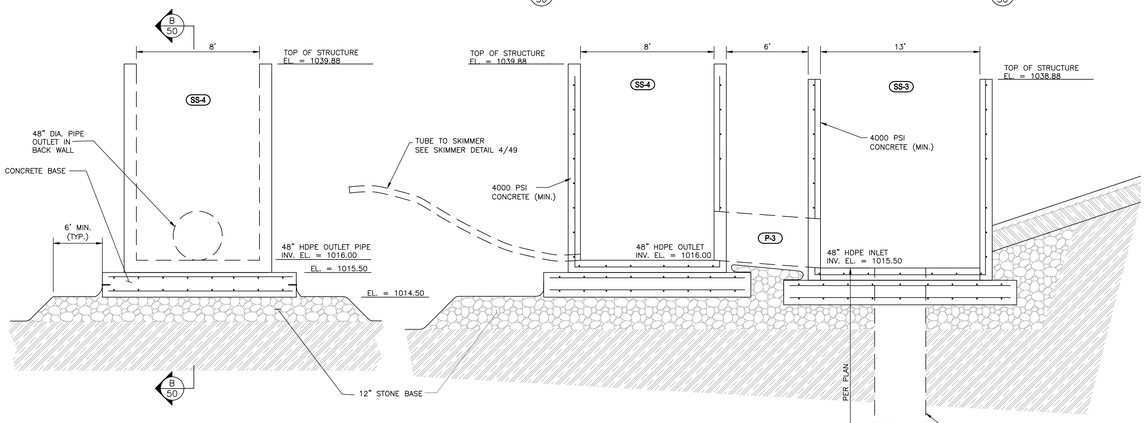
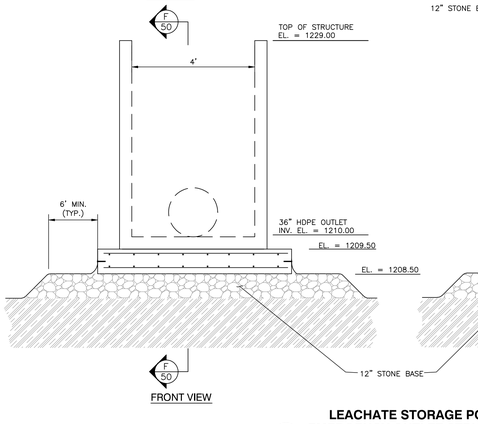


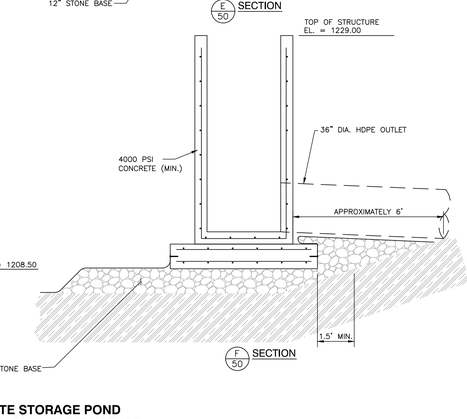
FRONT VIEW

B 50 SECTION

SOUTH SEDIMENTATION POND OUTLET STRUCTURES 1 AND 2
1/50 NOT TO SCALE



FRONT VIEW



F 50 SECTION

LEACHATE STORAGE POND EMERGENCY OUTLET STRUCTURE
7/50 NOT TO SCALE

REVISIONS			
DATE	NO.	DESCRIPTION	APPD.
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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

LEACHATE STORAGE POND AND SEDIMENTATION POND DETAILS

DWG NO: 12-30110-50-A

SCALE: AS NOTED	CIVIL ENGINEERING
DR: .	APPROVED BY:
CH: .	
SUP: .	
ENG: .	
DATE:	

AEP AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

ANTHONY P. AMICON
REGISTERED
19208
STATE OF WEST VIRGINIA
PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
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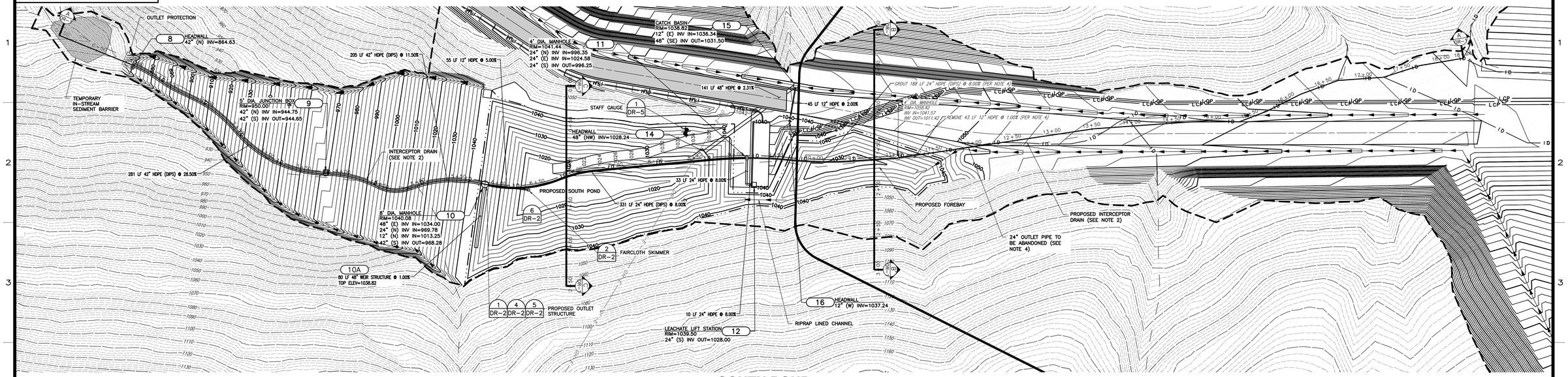
DRAWN BY:	DAR	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	APRIL 2012	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

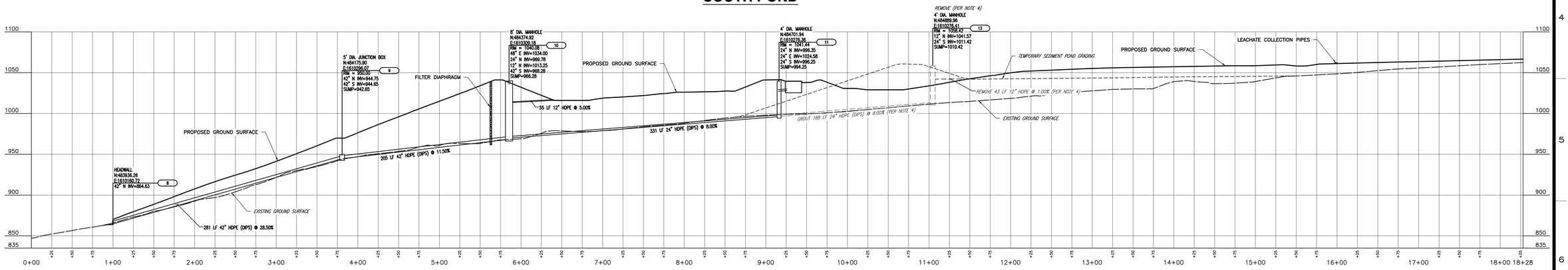
PLOT DATE: 8/2/2012 - 11:47:17 AM
PLOT BY: ROBERT LOTT
BY: USER.PLOT

IGS0506

DWG NO: DR-1

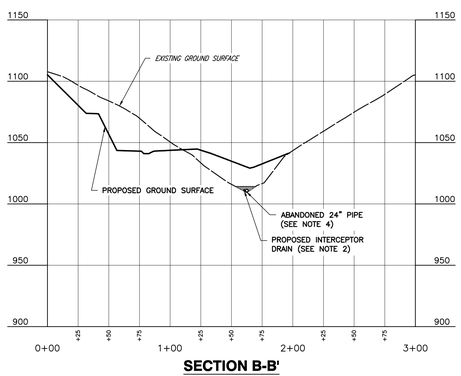


SOUTH POND



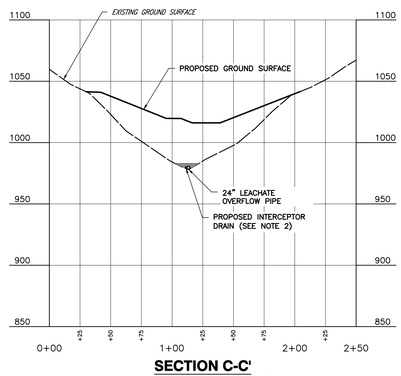
SECTION A-A'

SCALE H:1"=50'; V:1"=50'



SECTION B-B'

SCALE H:1"=50'; V:1"=50'



SECTION C-C'

SCALE H:1"=50'; V:1"=50'

NOTES:

1. DRAWING REPRESENTS SOUTH POND CONSTRUCTION AS PART OF THE PHASE 1 LANDFILL CONSTRUCTION.
2. INTERCEPTOR DRAIN TO FOLLOW EXISTING GROUND ALONG EXISTING CREEK BOTTOM.
3. ALL PIPES SHOWN ARE TO BE HDPE SDR-26.
4. 4' DIAMETER MANHOLE AND 24" DIAMETER OUTLET PIPE FOR TEMPORARY SEDIMENT POND OUTLET SHALL BE REMOVED ABOVE GROUND, GROUTED AND ABANDONED IN-PLACE BELOW GRADE.

SOUTH POND		
NAME	VOLUME (CU FT)	ELEVATION (FT)
SEDIMENTATION	206,910	1031.08
CLEANOUT	124,146	1027.63
2-YEAR RUNOFF	319,027	1038.92
PRINCIPAL SPILLWAY*	526,317	1038.92
10-YEAR RUNOFF	334,491	1039.20
EMERGENCY SPILLWAY		1040.08
25-YEAR RUNOFF	357,497	1039.60
100-YEAR RUNOFF	374,723	1039.90
TOP OF BERM*	653,391	1041.08

* TOTAL VOLUME OF POND INCLUDING SEDIMENT AND STORMWATER STORAGE.

LEGEND

- EXISTING CONTOURS
- EXISTING STREAM
- EXISTING OVERHEAD ELECTRICAL POWER LINES
- LIMITS OF EARTHWORK
- LIMITS OF WASTE
- STABILIZED CHANNEL
- PROPOSED ROADWAY
- PROPOSED CONTOUR
- CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER
- PROPOSED HEADWALL
- PROPOSED STORM SEWER
- STAFF GAUGE
- PROPOSED INTERCEPTOR DRAIN PIPE
- LEACHATE COLLECTION PIPE
- PROPOSED LEACHATE FORCE MAIN

NORTH

HORZ. SCALE: 1"= 50

VERT. SCALE: 1"= 50

CONTOUR INTERVAL = 2 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF VIRGINIA PROFESSIONAL ENGINEER

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DRAWN BY:	MTF	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	JANUARY 2013	DWG SCALE:	AS NOTED	PROJECT NO.:	110-416

DATE	NO.	DESCRIPTION	APPD.
		REVISIONS	

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

SOUTH POND PLAN

DWG NO: DR-1

SCALE: 1"=50' CIVIL ENGINEERING

DR: CH: SUP: ENG: DATE:

APPROVED BY:

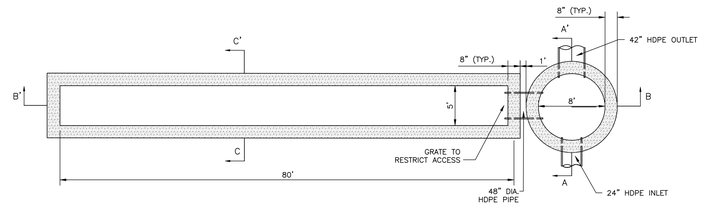
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP. 1 RIVERSIDE PLAZA COLUMBUS, OH 43215

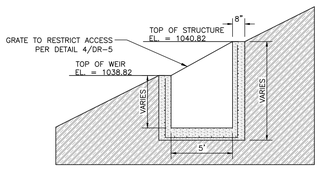
P:\2011\110-4161-CAD\DWG\Permit Set\DR-1 SOUTH POND PLAN.dwg|DR-1 SOUTH POND PLAN| 1/25/2013 - 10:01 - LM 1/25/2013 8:18 AM

IGS0506

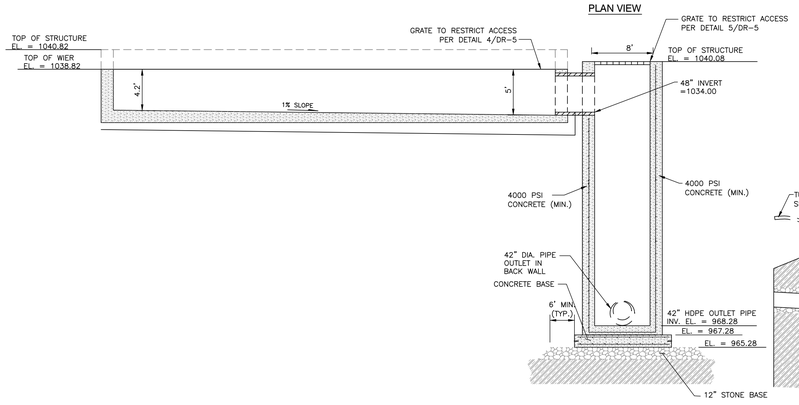
DWG NO: DR-2



PLAN VIEW



C-C' SECTION



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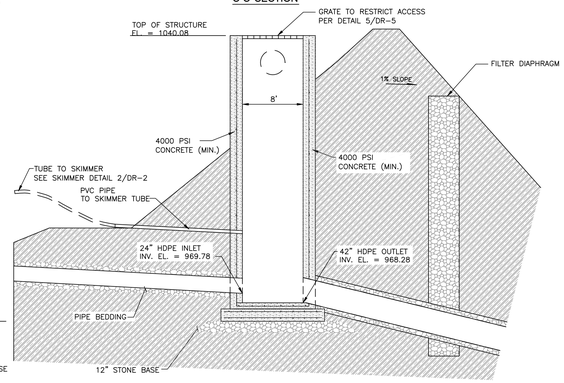
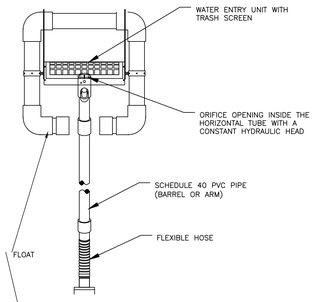
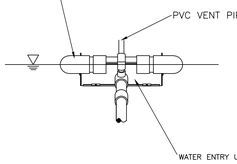


A-A' SECTION

SOUTH POND OUTLET STRUCTURES 10 AND 10A
1 DR-2
NOT TO SCALE



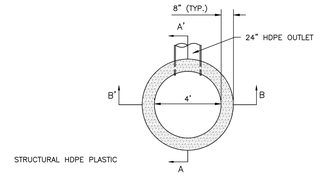
TOP VIEW

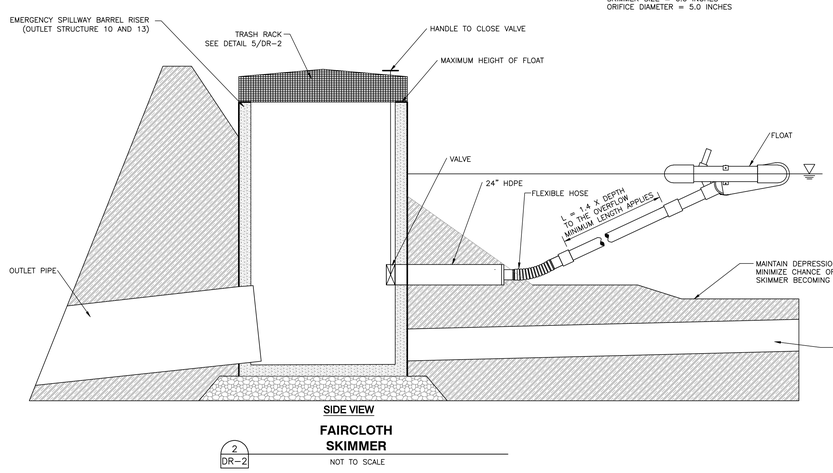


END VIEW

SOUTH POND:
SKIMMER SIZE = 6.0 INCHES
ORIFICE DIAMETER = 5.7 INCHES

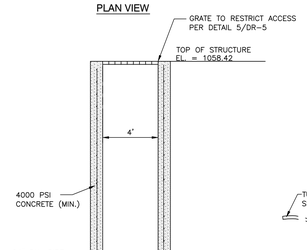
TEMPORARY SEDIMENTATION POND:
SKIMMER SIZE = 6.0 INCHES
ORIFICE DIAMETER = 5.0 INCHES



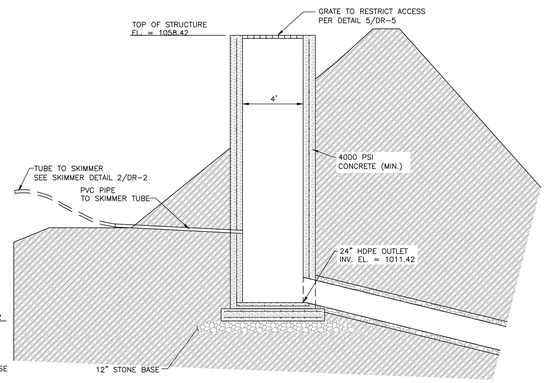


SIDE VIEW

FAIRCLOTH SKIMMER
2 DR-2
NOT TO SCALE

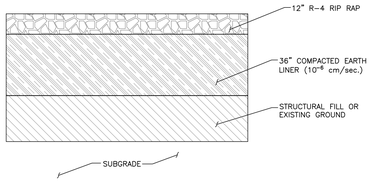


B-B' SECTION

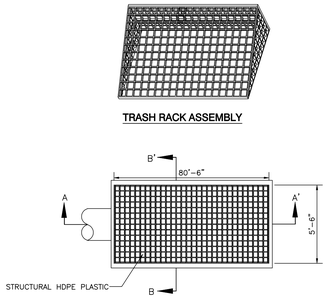


A-A' SECTION

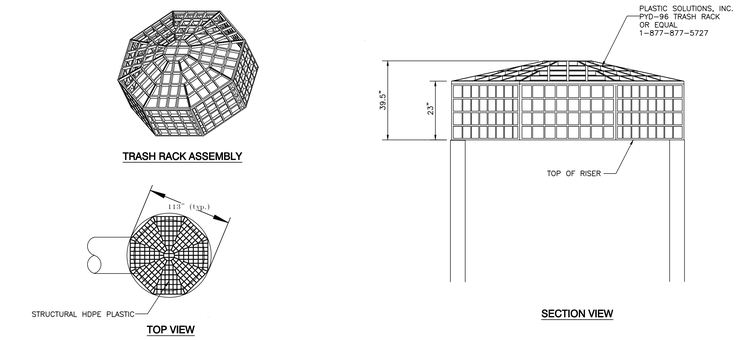
TEMPORARY SEDIMENT POND OUTLET STRUCTURE
3 DR-2
NOT TO SCALE



SOUTH SEDIMENTATION POND AND FOREBAY LINER
6 DR-2
NOT TO SCALE



PRIMARY WEIR - TRASH RACK
4 DR-2
N.T.S.



EMERGENCY OUTLET BARREL RISER - TRASH RACK
5 DR-2
N.T.S.

DATE	NO.	DESCRIPTION	APPR.
		REVISIONS	

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

POND DETAILS

DWG NO: DR-2

SCALE: N.T.S. | CIVIL ENGINEERING

DR: . | CH: . | SUP: . | ENG: . | DATE: .

APPROVED BY: .

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 - 800.759.5614 - Fax: 513.985.0228
www.cecinc.com

DRAWN BY: MTF | CHECKED BY: JSF | APPROVED BY: APA
DATE: JANUARY 2013 | DWG SCALE: AS NOTED | PROJECT NO: 110-416

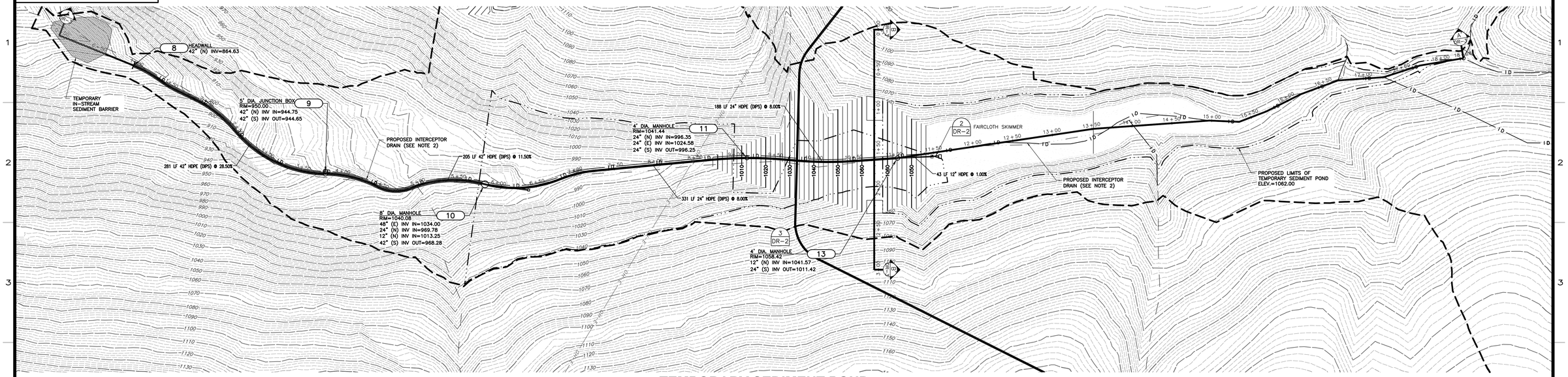
AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

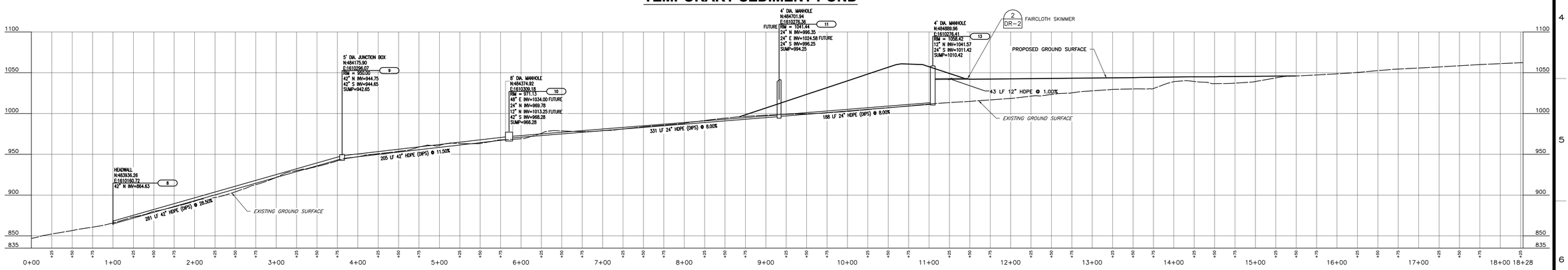
PLOT DATE: 02-MAR-13
PLOTTED BY: BRIAN SCOTT

IGS0506

DWG NO: DR-3

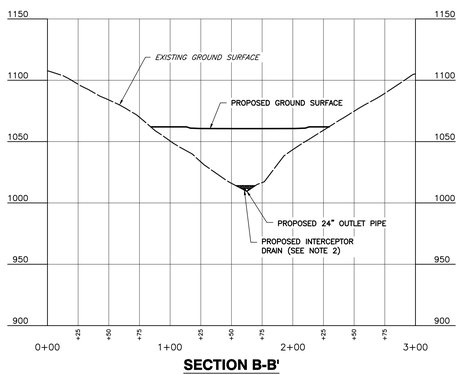


TEMPORARY SEDIMENT POND



SECTION A-A'

SCALE H:1"=50'; V:1"=50'



SECTION B-B'

SCALE H:1"=50'; V:1"=50'

NOTES:

1. TEMPORARY SEDIMENT POND SHALL BE CONSTRUCTED PRIOR TO PHASE 1 CONSTRUCTION AND SHALL BE ABANDONED PRIOR TO OPERATION OF SOUTH POND. A MAXIMUM STORAGE CAPACITY OF 15 ACRE-FEET SHALL BE MAINTAINED BETWEEN THE TEMPORARY POND AND SOUTH POND AT ALL TIMES.
2. INTERCEPTOR DRAIN TO FOLLOW EXISTING GROUND ALONG EXISTING CREEK BOTTOM.
3. ALL PIPES SHOWN ARE TO BE HDPE SDR-26.

LEGEND

- EXISTING CONTOURS
- EXISTING STREAM
- EXISTING OVERHEAD ELECTRICAL POWER LINES
- LIMITS OF EARTHWORK
- LIMITS OF WASTE
- PROPOSED CONTOUR
- CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER
- PROPOSED HEADWALL
- PROPOSED STORM SEWER
- PROPOSED INTERCEPTOR DRAIN PIPE

TEMPORARY SEDIMENT POND		
NAME	VOLUME (CU FT)	ELEVATION (FT)
SEDIMENTATION	217,800	1052.08
CLEANOUT	130,680	1050.22
2-YEAR RUNOFF	250,753	1058.42
PRINCIPAL SPILLWAY*	486,553	1058.42
10-YEAR RUNOFF	278,954	1059.01
EMERGENCY SPILLWAY		1061.00
25-YEAR RUNOFF	314,594	1059.73
100-YEAR RUNOFF	373,938	1060.89
TOP OF BERM*	651,505	1062.00

* TOTAL VOLUME OF POND INCLUDING SEDIMENT AND STORMWATER STORAGE.

NORTH

0 50 100 HORZ. SCALE: 1"= 50

0 50 100 VERT. SCALE: 1"= 50

CONTOUR INTERVAL = 2 FEET

ANTHONY P. AMICON REGISTERED 19206 STATE OF VIRGINIA PROFESSIONAL ENGINEER

DATE	NO.	DESCRIPTION	APPD.

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

TEMPORARY SEDIMENT POND

DWG NO: DR-3

SCALE: 1"=50'

CIVIL ENGINEERING

DR: . CH: . SUP: . ENG: . DATE: .

APPROVED BY:

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY:	MTF	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	JANUARY 2013	DWG SCALE:	AS NOTED	PROJECT NO.:	110-416

AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

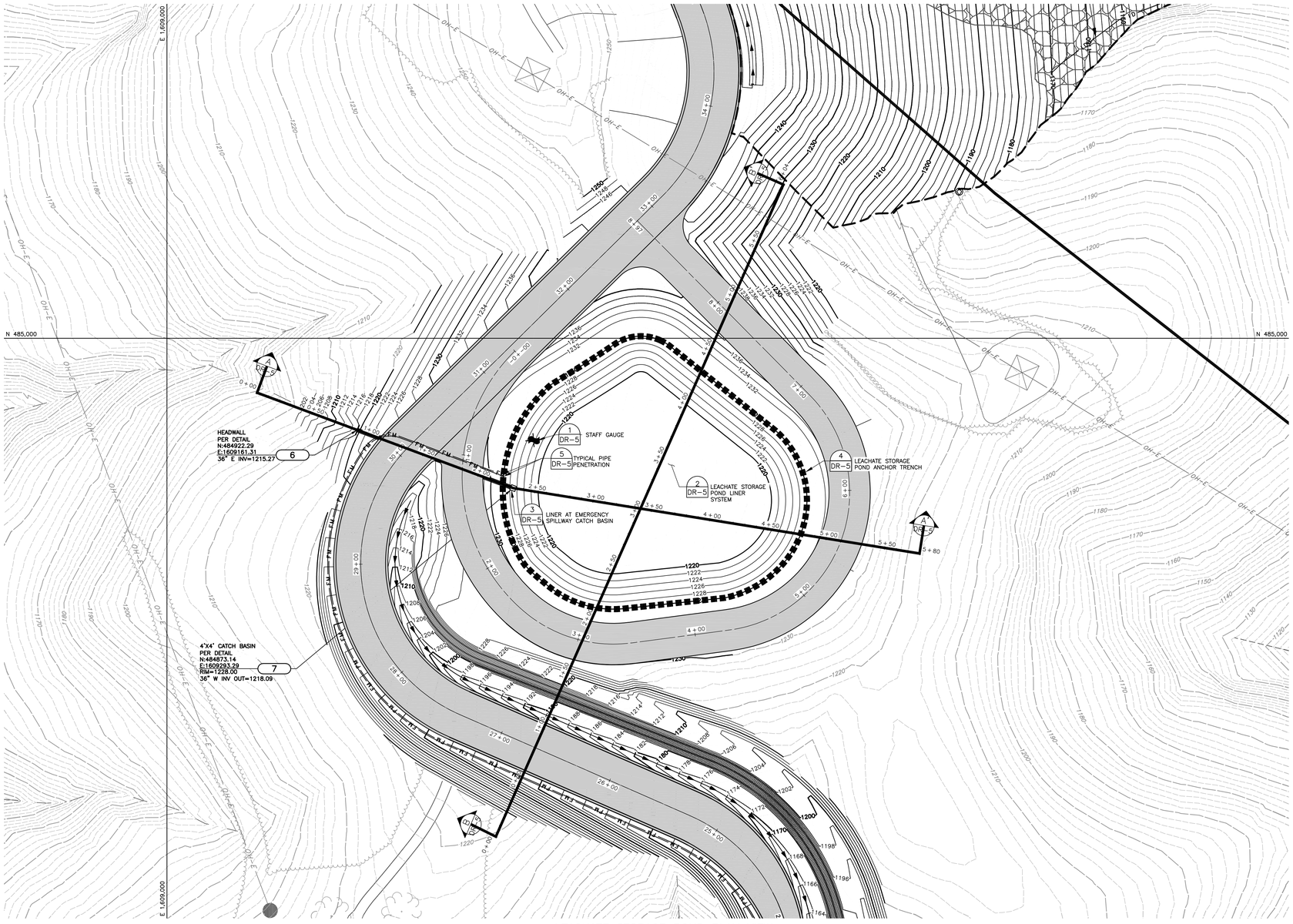
P:\2011\110-4161-CADD\DWG\Permit Set\DR-3 TEMPORARY SEDIMENT POND.dwg[DR-3 TEMPORARY SEDIMENT POND] 1/25/2013 - Rod - LP: 1/25/2013 8:35 AM

IGS0506

DWG NO: DR-4

LEGEND

- EXISTING CONTOURS
- EXISTING STREAM
- EXISTING OVERHEAD ELECTRICAL POWER LINES
- EXISTING ELECTRICAL POLE AND TOWER
- EXISTING VEGETATION
- EXISTING ROADS
- PROPOSED CONTOUR
- PERIMETER DRAINAGE SWALE
- LIMITS OF WASTE
- LIMITS OF DISTURBANCE
- CROSS SECTION LOCATION IDENTIFIER AND DRAWING NUMBER
- PROPOSED HAUL ROAD
- STAFF GAUGE
- PROPOSED LEACHATE FORCE MAIN



LEACHATE STORAGE POND PLAN VIEW

NOTES:

1. THE CONTRACTOR SHALL PREPARE THE SUBGRADE PER THE GEOSYNTHETIC CLAY LINER MANUFACTURES RECOMMENDATIONS. THE LEACHATE STORAGE PONDS SUBGRADE SHALL BE CERTIFIED AND APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF THE LINER SYSTEM.
2. CONTRACTOR TO COORDINATE DESIRED MARKINGS, BASE TYPE, AND EXACT LOCATION OF THE STAFF GAUGE WITH THE OWNER PRIOR TO INSTALLATION. CONTRACTOR TO ENSURE BASE OF STAFF GAUGE DOES NOT DAMAGE LEACHATE STORAGE POND LINER DURING INSTALLATION.

LEACHATE STORAGE POND		
NAME	VOLUME (CU FT)	ELEVATION (FT)
60% CLEANOUT*	190,851	1225.68
EMERGENCY SPILLWAY	318,085	1229.00
TOTAL PROVIDED	361,217	1230.00

* POND WILL BE CLEANED WHEN THESE LIMITS ARE REACHED (AS IDENTIFIED ON THE STAFF GAUGE).

NORTH
SCALE IN FEET
0 40 80
CONTOUR INTERVAL = 2 FEET

DATE	NO.	DESCRIPTION	APPD.

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

LEACHATE STORAGE POND PLAN

DWG NO: DR-4

SCALE: 1"=40' | CIVIL ENGINEERING

DR: . CH: . SUP: . ENG: . DATE: .

APPROVED BY:

ANTHONY P. AMICON REGISTERED 19206 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 - 800.759.5614 - Fax: 513.985.0228
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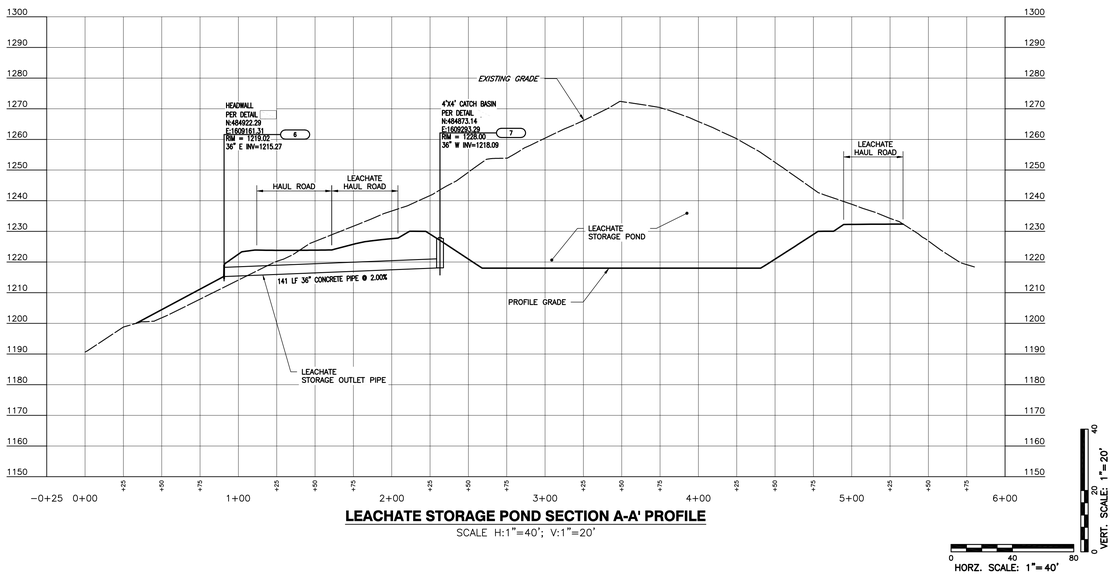
DRAWN BY:	MTF	CHECKED BY:	JSF	APPROVED BY:	APA
DATE:	JANUARY 2013	DWG SCALE:	AS NOTED	PROJECT NO:	110-416

AEP AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

P:\2011\110-416\--CAD\DWG\Permit Set\DR-4 LEACHATE STORAGE POND PLAN.dwg|DR-4 LEACHATE STORAGE POND PLAN| LS (25/01/2013 - mvd) - LP, 1/25/2013 8:38 AM

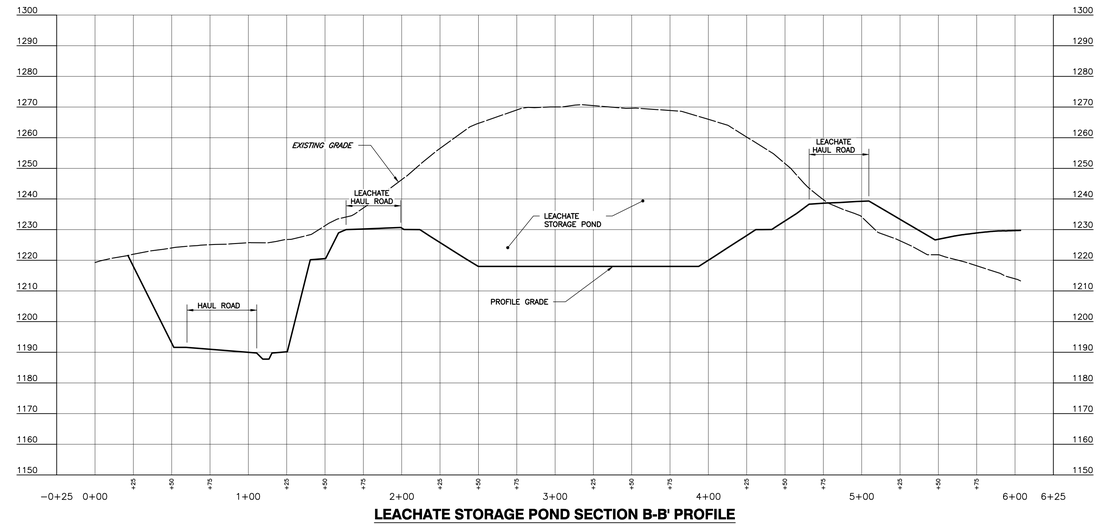
IGS0506

DWG NO: DR-5



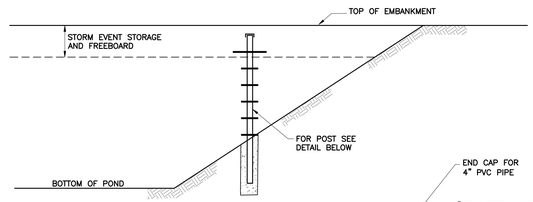
LEACHATE STORAGE POND SECTION A-A' PROFILE

SCALE H:1"=40'; V:1"=20'

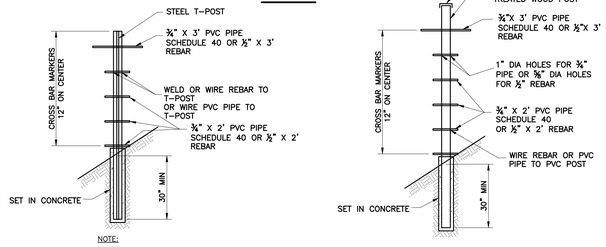


LEACHATE STORAGE POND SECTION B-B' PROFILE

SCALE H:1"=40'; V:1"=20'



SECTION

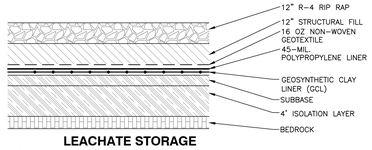


NOTE:

1. STAFF GAUGE CAN BE FABRICATED AS ABOVE OR OBTAINED FROM BEN MEADOWS, MODEL NO. 99005, FIBERGLASS STREAM GAUGE, 4" WIDE, ENGLISH, 16-20' OR OWNER APPROVED EQUAL.
2. STAFF GAUGE LOCATED IN LEACHATE STORAGE POND SHALL NOT PENETRATE LINER. FOUNDATION TO BE PREFABRICATED PEDESTAL BASE PLATE TO SIT BETWEEN SOIL AND RIP RAP LAYER.

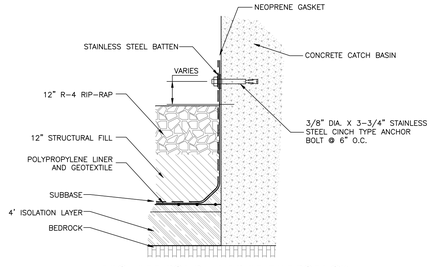
1 DR-5 **STAFF GAUGE**

N.T.S.



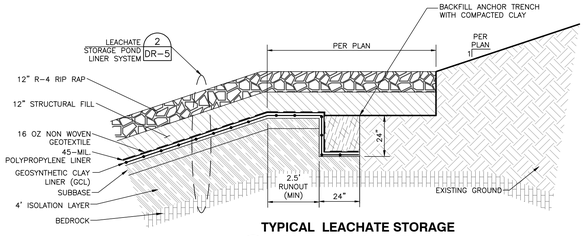
2 DR-5 **LEACHATE STORAGE POND LINER SYSTEM**

NOT TO SCALE



3 DR-5 **LEACHATE POND LINER AT EMERGENCY SPILLWAY CATCH BASIN**

NOT TO SCALE



4 DR-5 **TYPICAL LEACHATE STORAGE POND ANCHOR TRENCH**

NOT TO SCALE

DATE	NO.	DESCRIPTION	APPD.

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OHIO POWER COMPANY

MITCHELL PLANT

MARSHALL COUNTY WEST VIRGINIA

MITCHELL LANDFILL

LEACHATE STORAGE POND DETAILS

DWG NO: DR-5

SCALE: N.T.S. | CIVIL ENGINEERING

DR: . | CH: . | SUP: . | ENG: . | DATE: .

APPROVED BY: .

ANTHONY P. AMICON REGISTERED PROFESSIONAL ENGINEER STATE OF WEST VIRGINIA 19206

Civil & Environmental Consultants, Inc.
4274 Glendale-Milford Road - Cincinnati, OH 45242
Ph: 513.985.0226 · 800.759.5614 · Fax: 513.985.0228
www.cecinc.com

DRAWN BY: MTF | CHECKED BY: JSF | APPROVED BY: APA
DATE: JANUARY 2013 | DWG SCALE: AS NOTED | PROJECT NO: 110-416

AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 25-JANUARY-13
PLOT TIME: 8:28 AM
BY: DJERICH

P:\2011\110-416\-CAD\DWG\Permit Set\DR-5 LEACHATE STORAGE POND DETAILS.dwg(DR-5 LEACHATE STORAGE POND DETAILS) 1/25/2013 - 8:28 AM - DJ