

LANDFILL POST-CLOSURE PLAN

PLUM POINT ENERGY STATION CLASS 3N CCR LANDFILL

**PERMIT NO. 0303-S3N
AFIN: 47-00461**

OCTOBER 14, 2016

LANDFILL POST-CLOSURE PLAN

PLUM POINT ENERGY STATION
CLASS 3N CCR LANDFILL

PERMIT NO. 0303-S3N
AFIN: 47-00461

Prepared for

Plum Point Services Company, LLC
2732 County Road 623
Osceola, AR 72370

Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, AR 72211

FTN No. R14590-0998-001

October 14, 2016

PROFESSIONAL ENGINEER'S CERTIFICATION

In accordance with §257.104 , I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

This Post-Closure Plan for the Plum Point Energy Station Class 3N CCR Landfill was prepared und the direction and supervision of a qualified, State of Arkansas-registered Professional Engineer. Mr. Paul Crawford, PE, PG of FTN Associates, Ltd., was responsible for the overall preparation of the plan.



Paul Crawford, PE #8943

October 14, 2016
Date

TABLE OF CONTENTS

PROFESSIONAL ENGINEER’S CERTIFICATION	i
PLAN AMENDMENTS	ii
1.0 INTRODUCTION	1-1
1.1 Purpose of Plan	1-1
1.2 Plum Point Energy Station Information.....	1-1
1.3 Permit History	1-4
1.4 Existing Conditions of Landfill	1-6
2.0 POST-CLOSURE PLAN.....	2-1
2.1 Post-Closure Maintenance	2-1
2.1.1 Final Cover Maintenance.....	2-1
2.1.2 Site Security	2-1
2.1.3 Facility Roads	2-2
2.1.4 Stormwater Facilities	2-2
2.1.5 Leachate Removal System.....	2-2
2.2 Post-Closure Monitoring.....	2-2
2.2.1 Site Inspections	2-2
2.2.2 Groundwater Monitoring and Reporting	2-3
2.2.3 Stormwater Monitoring.....	2-3
2.2.4 Leachate Monitoring.....	2-3
2.3 Contact Persons.....	2-3
2.4 Planned Use of Site.....	2-3
2.5 Certification of Completion	2-4
2.6 Amendment of the Post-Closure Plan.....	2-4

TABLE OF CONTENTS (CONTINUED)

LIST OF APPENDICES

APPENDIX A:	Definitions
APPENDIX B:	Erosion Control Devices
APPENDIX C:	Post-Closure Inspection Form

LIST OF FIGURES

Figure 1.1	Site location map.....	1-2
Figure 1.2	Plant site map.....	1-5
Figure 1.3	Layout of PPES Class 3N CCR Landfill	1-7

1.0 INTRODUCTION

1.1 Purpose of Plan

In accordance with 40 CFR §257, *Subpart D - Disposal of Coal Combustion Residuals From Electric Utilities* (the CCR Rule), the purpose of this plan is to provide information on the procedures required for post-closure of a CCR unit at any point during its active life at the Plum Point Services Company, LLC (PPSC) Plum Point Energy Station (the Plant, PPES) Class 3N CCR Landfill (the Landfill). This Closure Plan (the Plan) includes:

1. A description of the monitoring and maintenance activities required by the CCR Rule;
2. Contact information for the person or office during post-closure care period;
3. The proposed intended use of the site during post-closure; and
4. Notification procedures upon completion of post-closure care.

Appendix A includes definitions for terms included in this Plan.

1.2 Plum Point Energy Station Information

The PPSC Plant Class 3N CCR Landfill is located in Mississippi County, approximately 2 miles southeast of Osceola, Arkansas. The 245-acre solid waste management facility is located within the Plant boundaries. The location of the facility is shown on Figure 1.1. The site is characterized by flat terrain and is situated within the Mississippi River floodplain. The Plant is located in an agricultural and industrial area.

PPSC is the owner of the landfill facility but uses a contractor to operate the Landfill for disposal of CCR materials generated at the Plant and general maintenance of the landfill facility.

The Plant generates electricity through the combustion of coal, which produces CCR materials that are captured through the facility air emission control systems and placed in the onsite landfill. The CCRs consist of bottom ash, economizer ash, fly ash, and coal pulverizer rejects.

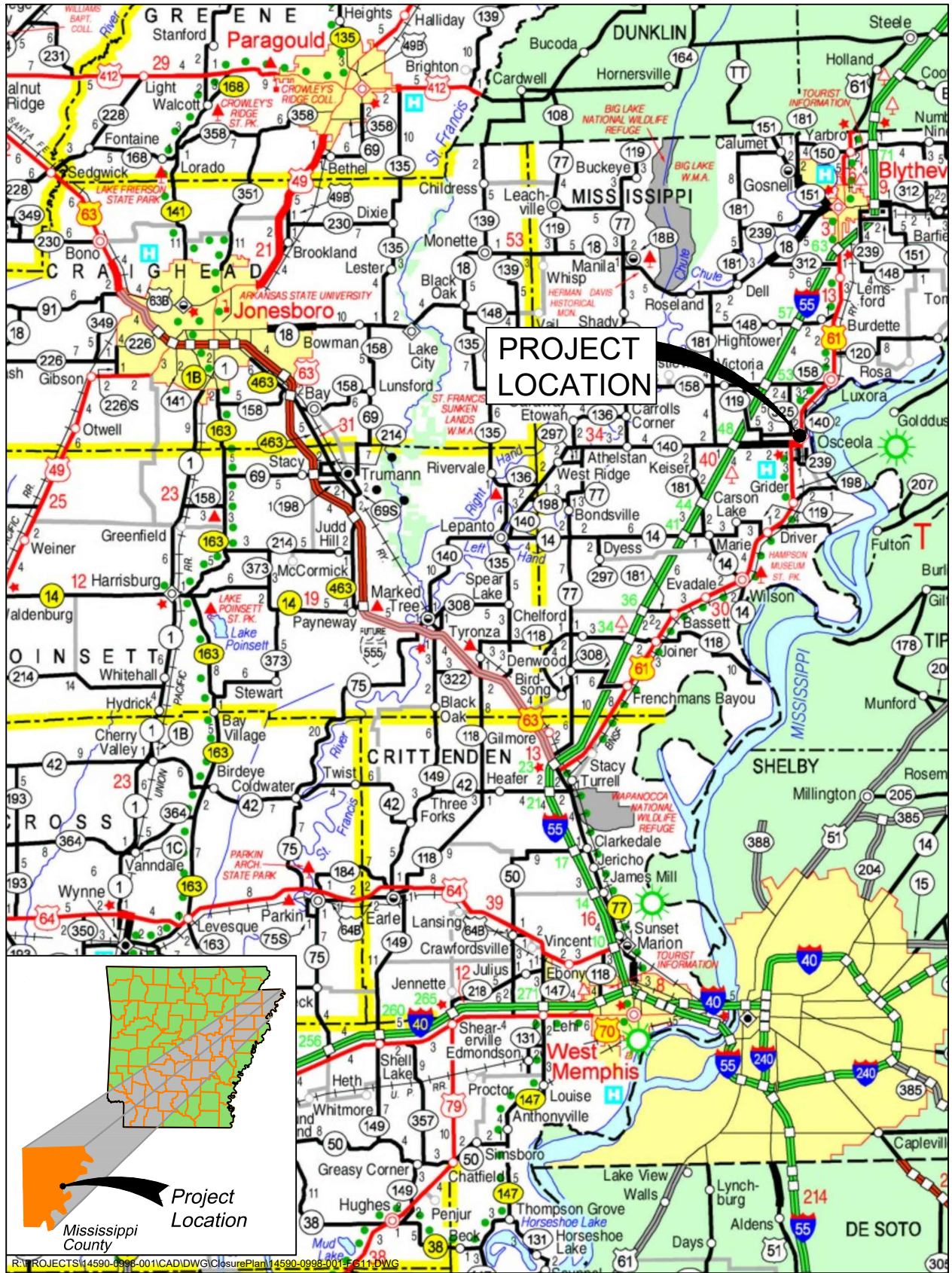


Figure 1.1. Site location map.

The bottom ash is the coarsest fraction of the coal ash and is collected in a water-filled trough beneath the steam generation furnace. Bottom ash is composed of angular, glassy particles with a porous surface texture and has the consistency of coarse sand. Coal pulverizer rejects are periodically sluiced to the collection trough beneath the boiler furnaces along with the bottom ash. The economizer ash is the heavier fraction of fly ash and is collected in hoppers and is periodically transferred via dry flight conveyors to a submerged flight conveyor that carries the bottom ash, economizer ash, and coal pulverizer rejects to a concrete basin called the “Bottom Ash Stockout Area.” The collected materials are periodically loaded into haul trucks and taken to the Landfill.

The largest fraction of the CCR material generated from the coal combustion process is fly ash. The fly ash is composed of very fine particles similar to glass and has the consistency of a powder. The plant has a fly ash collection system that captures dry air heater ash and dry scrubber ash in a series of fabric filter and air heater hoppers. The collected material is conveyed to a large silo, which is periodically unloaded into haul trucks and transferred to the Landfill.

The Plant air emission controls include a dry Flue Gas Desulfurization (FGD) system and an activated carbon injection system. The FGD system is designed to cool down the flue gas and remove sulfur dioxide and particulate matter from the gases emitted from the coal-fired boiler. This is accomplished by a chemical reaction using a slurry of calcium hydroxide with the flue gases, while simultaneously allowing the hot flue gases to dry the reaction products (calcium sulfite, calcium sulfate, calcium chloride, and calcium fluoride). The dry reaction products are collected with the fly ash materials in a fabric filter hopper system. The activated carbon injection system removes mercury from the gases emitted from the coal-fired boiler. The mercury combines chemically with powdered activated carbon and is removed in the same filter system as the fly ash and dry scrubber ash.

The used FGD lime slurry is collected and reused within the FGD system. The retained solids are containerized and periodically transported to the Ash Containment Area, and then to the onsite landfill.

Water is pumped from the Mississippi River and clarified to become either cooling tower makeup water or service water for plant use. The sludge generated from this process is conveyed

to a filter press where the solids are containerized and periodically transported to the onsite landfill. The filtrate from this process is pumped back to the clarifiers for treatment.

Although it varies greatly, the Plant generates approximately 500,000 tons of fly ash, bottom ash, and filter cake per year, of which approximately 85% is fly ash, 10% is bottom ash, and 5% is filter cake. The amount placed in the Landfill also varies from year to year, but the average for the past 5 years is approximately 150,000 cubic yards (cy), in-place volume.

The permitted landfill area is located west of the plant site as shown on Figure 1.2. The landfill is permitted to have 12 disposal areas, varying in size from 15 to 9 acres.

1.3 Permit History

In July 2001, Genesis Environmental Consulting, Inc. (GEC) submitted an application on behalf of Plum Point Energy Associates, LLC, to the Arkansas Department of Environmental Quality (ADEQ) for a solid waste disposal facility at the PPES. In October 2002, ADEQ issued a solid waste permit (0303-S3N) to construct and operate the proposed Class 3N CCR landfill facility.

Prior to construction of the landfill, GEC submitted a minor permit modification application in November 2005 to revise the final landfill grading plan, stormwater control plan, bottom grading plan, earthwork balance calculations, and Construction Quality Assurance (CQA) Plan. The application also included the request for an alternative bottom liner design. ADEQ requested the inclusion of a leachate collection system and Terracon Consultants, Inc. (which had purchased GEC) submitted revised permit documents in July 2006. ADEQ approved the minor permit modification in September 2006. Cell 1 of the landfill and the western stormwater pond were constructed in 2008. The Plant and the Landfill began operation in March 2010.

Since beginning operation, the landfill constructed an adjacent cell, Cell 3, in 2014 and began placing waste in the new cell in 2015.

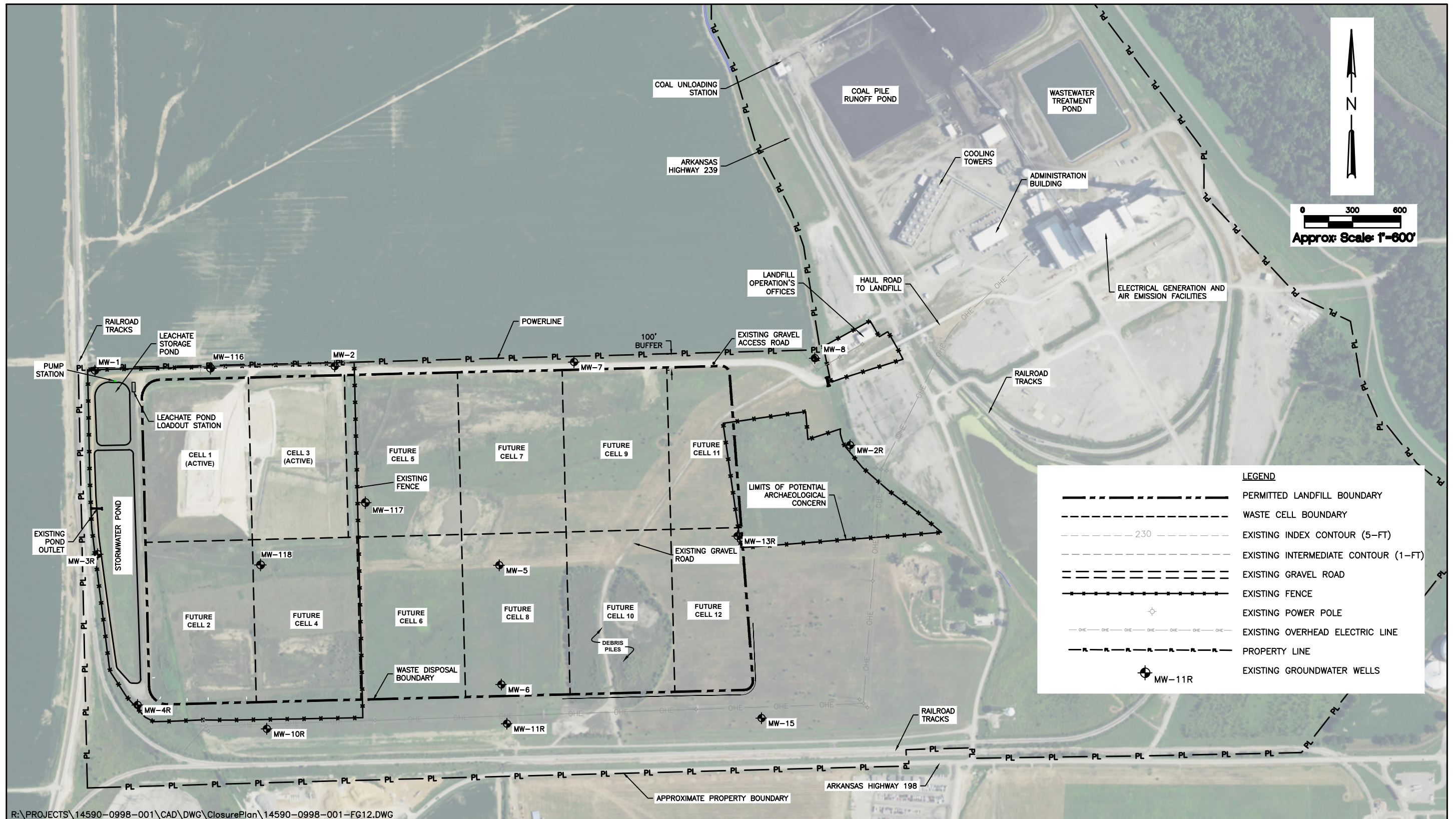


Figure 1.2. Plant site map.

1.4 Existing Conditions of Landfill

The current ADEQ-permitted PPES Class 3N Landfill is approximately 173 acres in size and has been designed to have 12 waste disposal cells (Figure 1.3). Cells 1 through 10 are about 15 acres in size with approximate dimensions of 1,000 ft by 660 ft. Cells 11 and 12 are narrower and smaller than the remaining cells to accommodate a potential archeological concern area located east of the Landfill. Cell 11 is about 9.6 acres (450 ft by 1,000 ft) and Cell 12 is about 10.8 acres (500 ft by 1,000 ft). The permitted disposal capacity (air space) for all 12 cells is 22,400,000 cubic yards.

The Landfill has been designed to meet Arkansas Pollution Control and Ecology Commission Regulation No. 22 standards. The bottom of the Landfill is divided to slope north or south to leachate collection sumps. The elevation of the bottom varies from 245 ft National Geodetic Vertical Datum (NGVD) in the center of the Landfill to 230 ft NGVD at the collection sump. The final surface of the Landfill has 4:1 (horizontal to vertical) slopes up to elevation 335 ft NGVD and then slopes at 5% to elevation 365 ft NGVD (Figure 1.3).

The bottom liner system for Waste Cells 1 and 3 were prepared in accordance with the 2006 permit for the facility (i.e., 12-inch minimum thickness compacted clay liner with a maximum hydraulic conductivity of 1×10^{-7} cm/sec, a 60-mil HDPE liner and a leachate collection system). Waste Cells 1 and 3 comprise the active disposal area of the CCR landfill that received CCR materials after October 19, 2015.

No final cover system has been installed on Waste Cells 1 and 3. However, as shown on Figure 1.3, the west, north, and south slopes of Cell 1 have received interim soil cover.

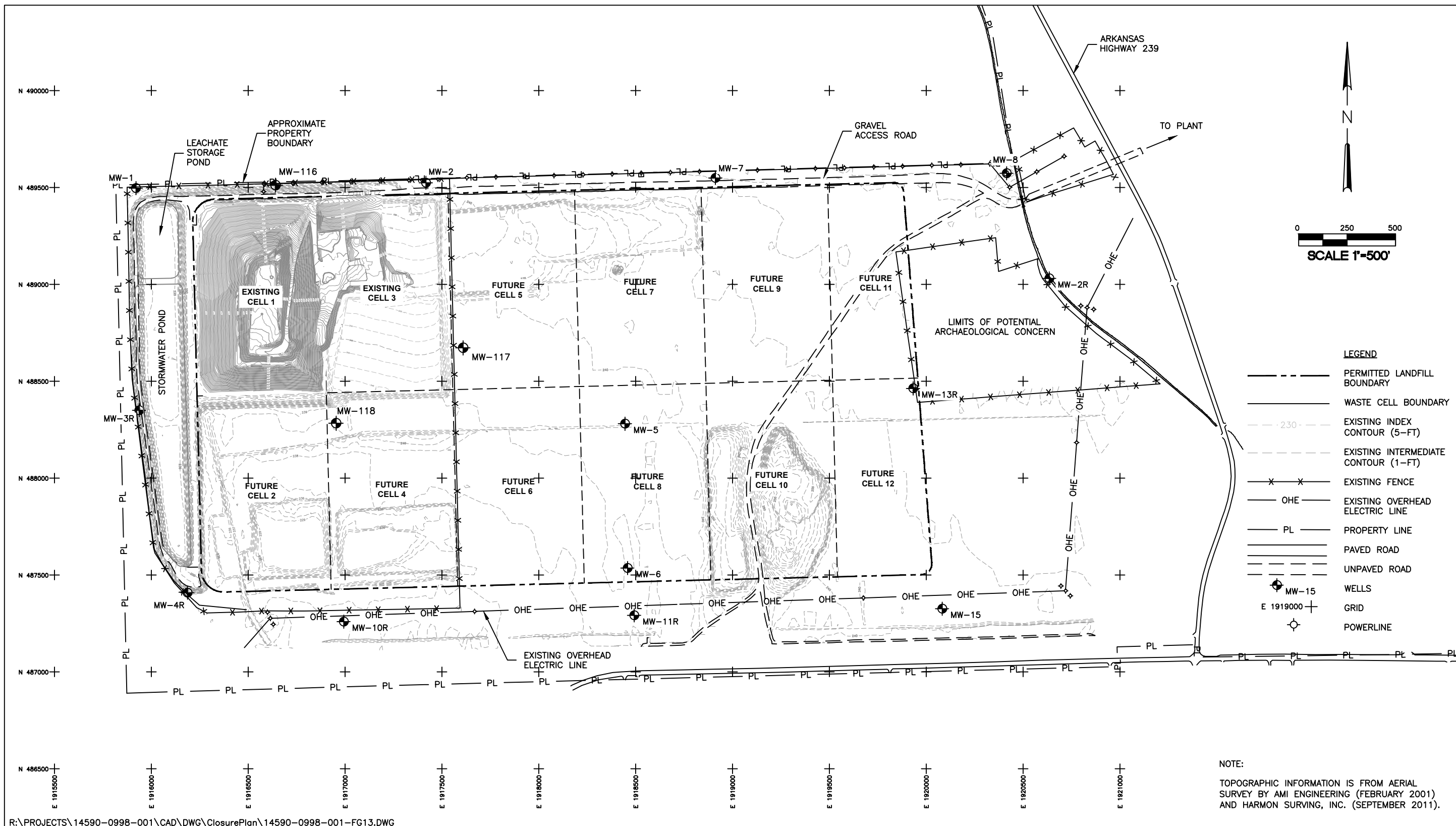


Figure 1.3. Layout of PPES class 3N CCR Landfill.

2.0 POST-CLOSURE PLAN

In accordance with §257.104(c)(1), the post-closure period for the CCR Landfill will be 30 years following the date of the certification by an Arkansas-registered professional engineer that the site has been closed. The post-closure period may be extended if the facility is operating under assessment monitoring in accordance with §257.95, and post-closure care activities will continue until the facility returns to detection monitoring in accordance with §257.95.

During the post-closure period, the CCR Landfill will be maintained and monitoring activities will be performed as described in the following subsections.

2.1 Post-Closure Maintenance

Post-closure care of the CCR Landfill will be conducted throughout the post-closure period. Post-closure care maintenance activities include monitoring and maintenance of the landfill and the environmental monitoring components. The facility will be inspected semi-annually to determine the condition of the landfill components.

2.1.1 Final Cover Maintenance

The integrity of the final cover will be maintained, including the repair of the cover, as necessary to correct the effects of settlement, subsidence, and erosion, and prevent run-off and run-on from damaging the cover. Vegetation shall be mowed at least annually to control the growth of unwanted vegetation that may interfere with the integrity of the landfill cover system. All cracked, eroded and uneven areas will be filled and reseeded.

2.1.2 Site Security

Access to the landfill after closure will be controlled through maintenance of existing fencing and signs, and all access gates will be locked to discourage unauthorized entry. Periodic inspections of the security system will be conducted to verify the integrity of the system. Repairs to the system will be scheduled as soon as practicable.

2.1.3 Facility Roads

Paved and gravel access roads shall be maintained regularly to provide access to the monitoring and maintenance equipment around the landfill. The facility roads shall be graded and additional asphalt or gravel material will be applied periodically to keep the roads safe and all areas of the landfill facility accessible.

2.1.4 Stormwater Facilities

Stormwater facilities such as ditches, letdowns, and culverts shall be inspected, and cleaned or repaired as necessary. Any erosion control devices (if present) will also be inspected and repaired or replaced as necessary. Appendix B includes examples of erosion control devices that could be used at the landfill.

2.1.5 Leachate Removal System

The leachate removal and transmission system (all pumping units, control panels, and pipeline) will be inspected to ensure proper operation and quantification of leachate generated. Any repairs or replacement will be done as soon as practicable.

2.2 Post-Closure Monitoring

Monitoring activities during the post-closure period includes site inspections, groundwater monitoring and reporting, stormwater monitoring and reporting, and leachate monitoring and reporting. Monitoring reports will be placed in the facility operating record and website.

2.2.1 Site Inspections

The facility inspections will be conducted semi-annually to determine the condition of the landfill components. The inspections will be recorded on the inspection form included in Appendix C.

2.2.2 Groundwater Monitoring and Reporting

Groundwater monitoring will continue during the post-closure period and will be conducted in accordance with §257.93 and the facility Groundwater Sampling and Analysis Plan (GWSAP).

2.2.3 Stormwater Monitoring

Stormwater from the CCR Landfill is routed through the perimeter ditches to the stormwater pond on the west end of the landfill, where is eventually released from the facility through the facility's National Pollutant Discharge Elimination System (NPDES) permitted outfall. Monitoring and reporting of stormwater related to the Landfill will be conducted in accordance with the facility NPDES, if required.

2.2.4 Leachate Monitoring

The leachate collection system will be monitored by collection and analysis of leachate samples in accordance with the facility GWSAP. In addition, the amounts of leachate generated and removed from the landfill will be recorded.

2.3 Contact Persons

The name, address, and telephone number of the person to contact about the facility during the post-closure period will be placed in the facility's operating record and website upon notice of closure of the CCR Landfill. The contact information will be updated in the facility operating record and website any time the role is assigned to a new person.

2.4 Planned Use of Site

Upon completion of post-closure care period, PPSC intends to allow the land to revert back to open grassland. The actual long-term use of the land will be determined upon notice of closure. The integrity of the final landfill cover, liner systems, groundwater monitoring wells, and leachate removal and transmission system will not be disturbed or compromised during the post-closure period.

2.5 Certification of Completion

Within 60 days following the completion of the post-closure period for the landfill facility, PPSC will prepare a notification verifying that the post-closure care has been completed. The notification will include a certification by an independent registered professional engineer verifying that post-closure care has been completed in accordance with the Plan and §257.104(d). Post-closure care will be completed when this notification is placed in the facility operating record and website.

2.6 Amendment of the Post-Closure Plan

In accordance with §257.104(d)(3), PPSC may amend this post-closure plan at any time. Specifically, PPSC must amend the written post-closure plan whenever:

1. There is a change in the operation of the CCR unit that would substantially affect the written post-closure care plan in effect; or
2. After post-closure activities have commenced, unanticipated events necessitate a revision of the written post-closure plan.

The post-closure plan must be amended at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise the plan. If the plan is revised after post-closure activities have commenced for a CCR unit, the owner or operator must amend the written post-closure plan no later than 30 days following the triggering event.

PPSC will obtain a written certification from a qualified professional engineer that the initial and any amendment of the written post-closure care plan meets the requirements of §257.104(d)(3). Any amendments to the Plan will be recorded in the Plan Amendments log at the front of this document.

APPENDIX A

Definitions

DEFINITIONS

The following definitions are from §257.53 of the CCR Rule and used in this Plan:

Active Life or In Operation: the period of operation beginning with the initial placement of CCR in the CCR unit and ending at completion of closure activities in accordance with §257.102.

Active portion: that part of the CCR unit that has received or is receiving CCR or non-CCR waste and that has not completed closure in accordance with §257.102.

Coal Combustion Residuals (CCR): fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

CCR Landfill: an area of land or land excavation that receives CCR and which is not a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave. It also includes sand and gravel pits and quarries that receive CCR, CCR piles, and any practice that does not meet the definition of a beneficial use of CCR.

CCR Unit: any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.

Closed Unit or Landfill: placement of CCR in a CCR unit has ceased, and the owner or operator has completed closure of the CCR unit in accordance with § 257.102 and has initiated post-closure care in accordance with § 257.104.

Existing CCR Landfill: a CCR Landfill that receives CCR both before and after October 15, 2015, or for which construction commenced prior to October 14, 2015 and receives CCR on or after October 14, 2015. A CCR landfill has commenced construction if the owner or operator has obtained the federal, state, and local approvals or permits necessary to begin physical construction and a continuous onsite physical construction program had begun prior to October 14, 2015.

Hydraulic Conductivity: the rate at which water can move through a permeable medium (i.e., the coefficient of permeability).

Lateral Expansion: a horizontal expansion of the waste boundaries of an existing CCR landfill or existing CCR surface impoundment made after October 14, 2015.

New CCR Landfill: a CCR landfill or lateral expansion of a CCR landfill that first receives CCR or commences construction after October 14, 2015. A CCR landfill has commenced construction if the owner or operator has obtained the federal, state, and local approvals or

permits necessary to begin physical construction and a continuous onsite physical construction program had begun after to October 14, 2015.

Operator: the person(s) responsible for the overall operation of a CCR unit.

Qualified Professional Engineer: an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located.

Recognized and Generally Accepted Good Engineering Practices: engineering maintenance or operation activities based on established codes, widely accepted standards, published technical reports, or a practice widely recommended throughout the industry. Such practices generally detail approved ways to perform specific engineering, inspection, or mechanical integrity activities.

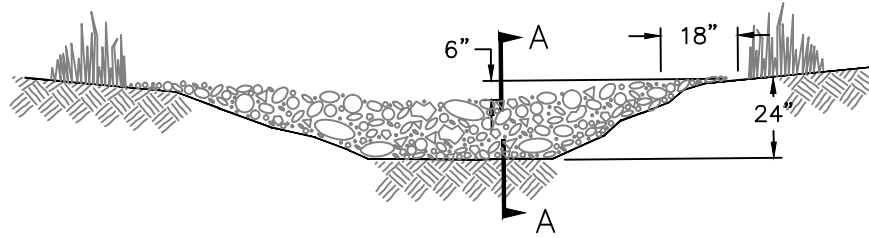
Run-Off: any rainwater, leachate, or other liquid that drains over land from any part of a CCR landfill or lateral expansion of a CCR landfill.

Run-On: any rainwater, leachate, or other liquid that drains over land onto any part of a CCR landfill or lateral expansion of a CCR landfill.

Structural Components: liners, leachate collection and removal systems, final covers, run-on and run-off systems, inflow design flood control systems, and any other component used in the construction and operation of the CCR unit that is necessary to ensure the integrity of the unit and that the contents of the unit are not released into the environment.

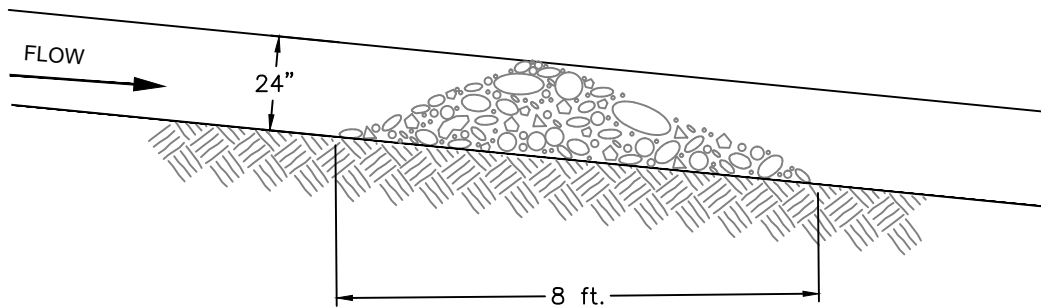
APPENDIX B

Erosion Control Devices



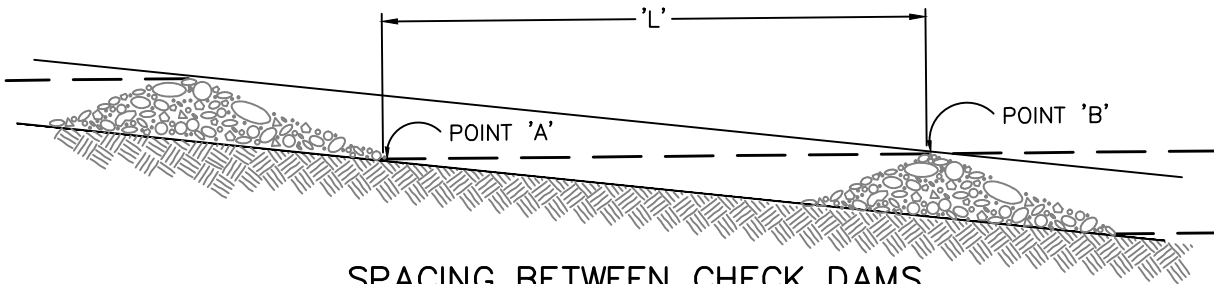
VIEW LOOKING UP STREAM

NOTE: KEY STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT OVERFLOW AROUND DAM.



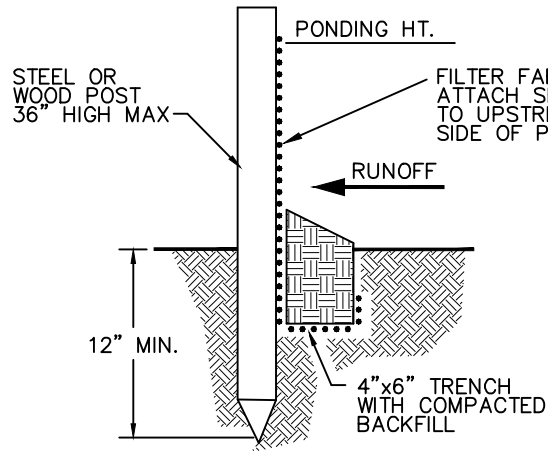
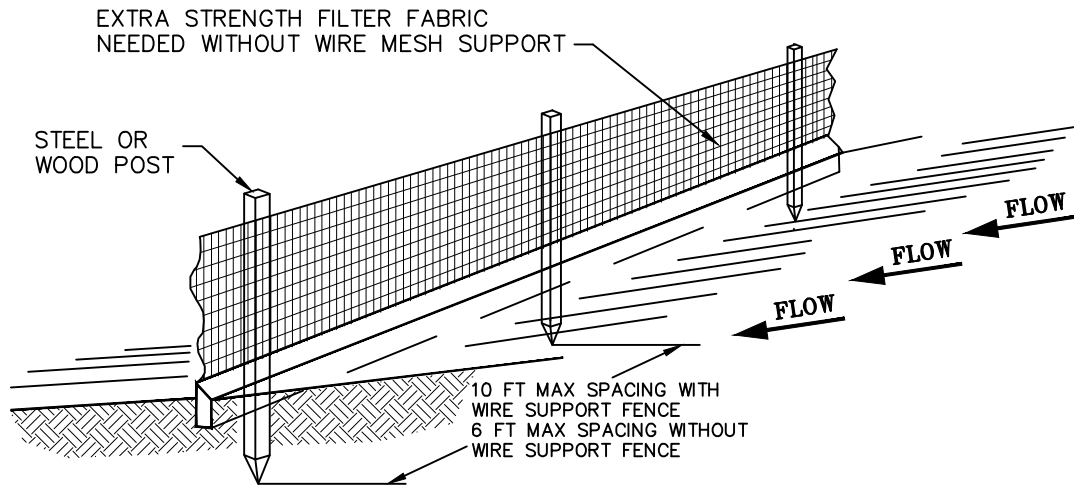
SECTION A-A

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION.

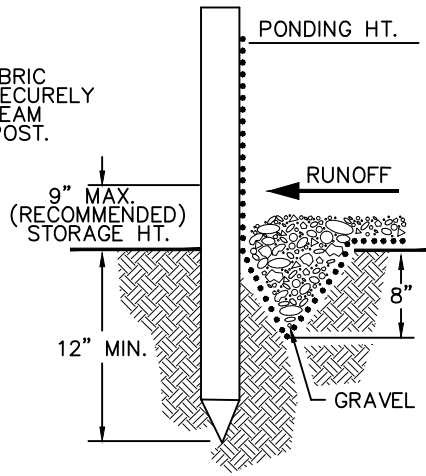


SPACING BETWEEN CHECK DAMS

Figure 1. Rock check dam detail.



STANDARD DETAIL
TRENCH WITH NATIVE BACKFILL

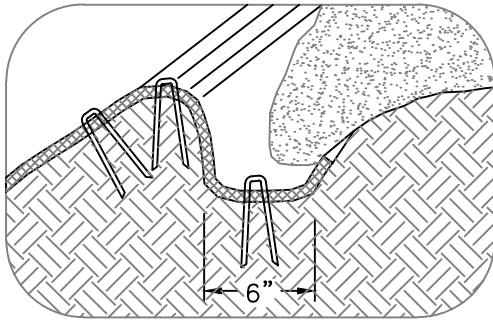


ALTERNATE DETAIL
TRENCH WITH GRAVEL

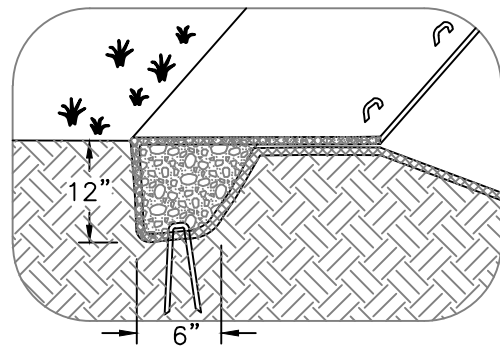
NOTES:

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

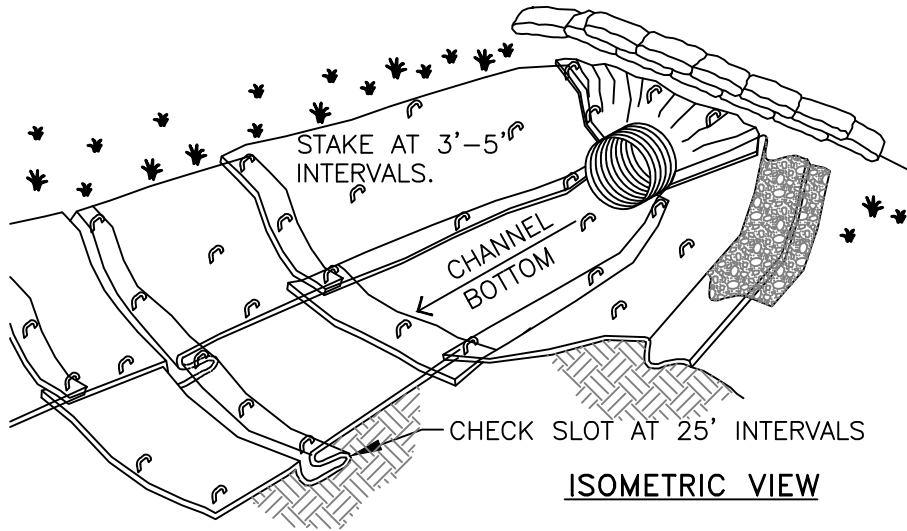
Figure 2. Silt fence detail.



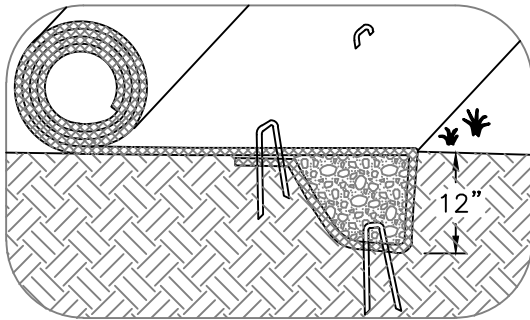
LONGITUDINAL ANCHOR TRENCH



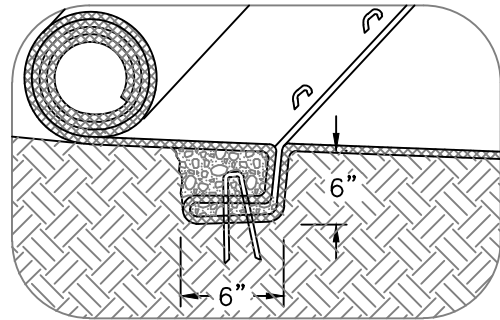
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH

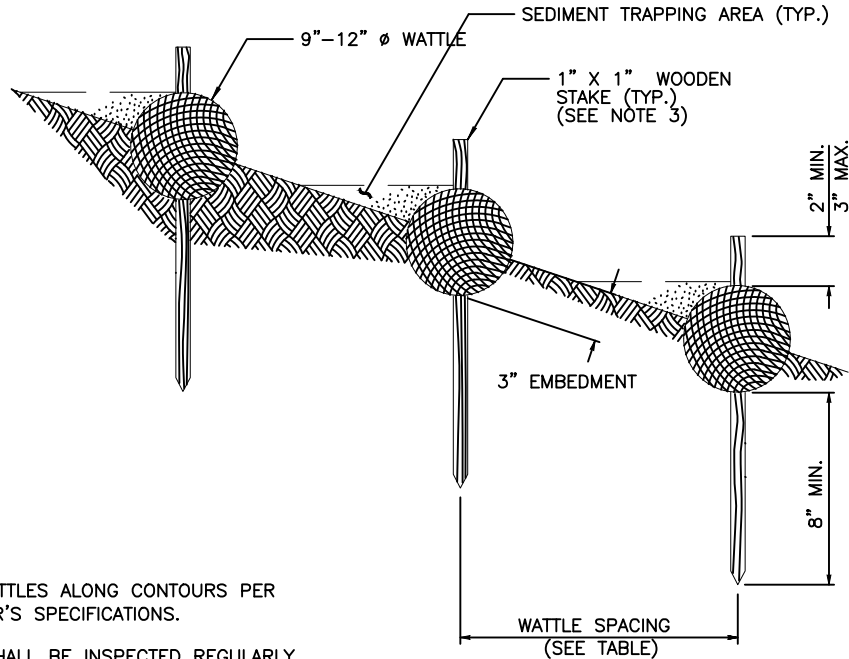


INTERMITTENT CHECK SLOT

NOTES:

1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
2. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

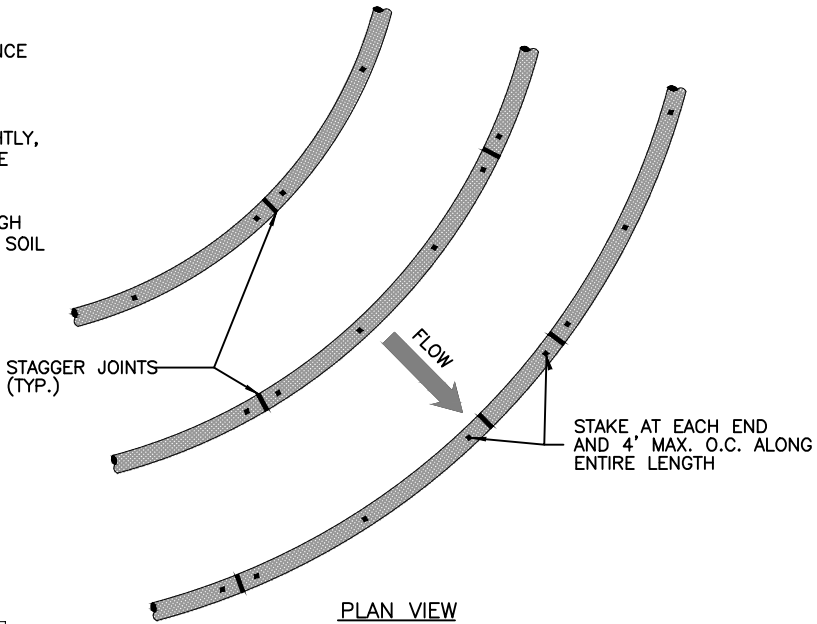
Figure 3. Erosion control matting detail.



ELEVATION VIEW

NOTES

1. INSTALL WATTLES ALONG CONTOURS PER MANUFACTURER'S SPECIFICATIONS.
2. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RUNOFF PRODUCING RAINFALL, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
3. LIVE STAKES MAY BE USED FOR PERMANENT INSTALLATIONS.
4. PERFORM MAINTENANCE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
5. INSTALL WATTLES SNUGLY INTO THE TRENCH. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
6. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLE AND INTO THE SOIL, WHEN SOIL CONDITIONS REQUIRE.



PLAN VIEW

WATTLE SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1	20 FEET
2:1	30 FEET
3:1	40 FEET
4:1	50 FEET

Figure 4. Wattle.

APPENDIX C

Post-Closure Care Inspection Form

**PLUM POINT SERVICES COMPANY CCR LANDFILL
POST-CLOSURE INSPECTION FORM**

Facility Name: Plum Point Energy Station Class 3N CCR Landfill			
Facility Address: 2732 South County Road 623, Osceola, AR 72370			
Date:	Time:	Weather:	
Inspection Representatives			
PPES:			
Others:			
Inspection Observations			
	Acceptable	Needs Improvement	Comments (See Page 2 for Additional Comments)
1. Final Cover System			
1a. General condition of final cover			
1b. Condition of vegetation			
1c. Condition of erosion control devices (if used)			
1d. Settlement areas			
1e. Stability of waste mass			
2. Site Security			
2a. Perimeter fencing			
2b. Gates			
2c. Signage			
3. Landfill Access Roads			
3a. Condition of paved roads			
3b. Condition of unpaved roads			
4. Stormwater Control Facilities			
4a. Condition of culverts			
4b. Condition of ditches			
4c. Condition of diversion berms			
4d. Condition of letdowns			
4e. Condition of stormwater pond			
5. Leachate Collection and Transmission System			
5a. Condition of leachate pumps			
5b. Condition of leachate control panels			
5c. Status of leachate levels in disposal cells			
5d. Condition of leachate collection piping			
5e. Condition of cleanouts and headwalls			
5f. Condition of leachate transmission piping			
6. Groundwater Monitoring Wells			
6a. Condition of well casings and locks			
6b. Condition of well pads and pipe bollards			
6c. Access to wells			
7. Other Items			
7a.			
7b.			
7c.			
7d.			
7e.			
Print Name of Inspector Completing Form	Signature		Date

