AECOM Environment

Submitted to:
Platte River Power Authority
Fort Collins, CO

Submitted by:
AECOM
Greenwood Village, Colorado
60514657
October 12, 2016

# Solid Waste Disposal Facility Closure Plan

# Platte River Power Authority
# Fort Collins, Colorado

AECOM Environment

Submitted to:
Platte River Power Authority
Fort Collins, CO

Submitted by:
AECOM
Greenwood Village, Colorado
60514657
October 12, 2016

# Solid Waste Disposal Facility Closure Plan

# Platte River Power Authority
# Fort Collins, Colorado

Prepared By
Emily Nebel, P.E., Project Engineer

Reviewed By
Margaret C. Zebley, P.E., Senior Engineer

Approved By
Geoff Webb, Senior Project Manager

# Contents

# List of Figures

# List of Acronyms

| | |
|---|---|
| CCR | coal combustion residuals |
| CDPHE | Colorado Department of Public Health and Environment |
| CFR | Code of Federal Regulations |
| cm/sec | centimeters per second |
| CQA | Construction Quality Assurance |
| CQAP | Construction Quality Assurance Plan |
| H:V | horizontal to vertical |
| in/hr | inches per hour |
| PRPA | Platte River Power Authority |
| QA/QC | quality assurance/quality control |
| Rawhide | Rawhide Energy Station |
| RCRA | Resource Conservation and Recovery Act |
| USDA | United States Department of Agriculture |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |

# 1.0 Introduction

This Closure Plan has been prepared on behalf of Platte River Power Authority (PRPA) to meet the Coal Combustion Residuals (CCR) Regulations (Final CCR Rule) as detailed in 40 Code of Federal Regulations (CFR) 257.102. Closure of the Solid Waste Disposal Facility will be completed by leaving the CCR in place and installing a final cover system as required by the regulations. This section discusses site background, regulatory drivers, and purpose.

## 1.1 Background

Rawhide Energy Station (Rawhide) is a 4,560 acre facility located at 2700 East County Road 82 in Wellington, CO (**Figure 1**). Construction of Rawhide began in 1979 and it has operated as a coal-fired power plant since. The primary land use on the Rawhide property is those related to utility service: electric generation.

Power generation at Rawhide produces CCR. Rawhide places these residuals in the Solid Waste Management Facility (also called the CCR Monofill), located in the northwest corner of the Rawhide site. The Rawhide materials currently authorized for placement in the CCR Monofill include the following:

- dry waste products (including fly ash) collected by the flue gas cleaning process;
- bottom ash removed from the bottom ash ponds;
- sludge from the phosphorous removal system sludge ponds; and
- inorganic construction wastes.

The location of the CCR Monofill is shown on **Figure 1**.

## 1.2 Regulations

The CCR Monofill is regulated by the Final CCR Rule promulgated by the United States Environmental Protection Agency (USEPA, 2015) under 40 CFR Part 257, Subtitle D of the Resource Conservation and Recovery Act (RCRA). The CCR Monofill is also regulated by the Colorado Department of Public Health and Environment (CDPHE) – Hazardous Materials and Waste Management Division under the Regulations Pertaining to Solid Waste Sites and Facilities (6 Code of Colorado Regulations 1007-2, Part 1) (Solid Waste Regulations) (CDPHE, 2015). The disposal area is located within the boundaries established by the PRPA Certificate of Designation which covers the Northeast ¼ of Section 6, Township 10 North, Range 68 West, and the Southern ½ of Section 31, Township 11 North, Range 68 West, as shown on **Figure 1**. This Closure Plan, however, was developed to meet only the requirements of the Final CCR Rule, as detailed in 40 CFR 257.102.

## 1.3 Owner/Operator Information

The owner and operator of the CCR Monofill (and the contact during the post-closure period) is:

Platte River Power Authority
2000 East Horsetooth Road
Fort Collins, CO 80525
Attn: Christopher Wood
970-266-7906

## 1.4 Purpose

The purpose of this Closure Plan is as follows.

1. Describe the steps necessary to close the CCR Monofill at any point during the active life of the CCR Monofill consistent with recognized and generally accepted good engineering practices.

2. Provide a narrative description of how the CCR Monofill will be closed in accordance with 40 CFR 257.102.
3. Describe the final cover system and the methods and procedures to be used to install the final cover.
4. Provide a schedule for completing all activities necessary to satisfy the closure criteria in 40 CFR 257.102.

# 2.0 Site Characterization

This section characterizes the site and includes a discussion of the site hydrology, hydrogeology, soil, and current conditions at the CCR Monofill.

## 2.1 Site Hydrology and Hydrogeology

As discussed in the Annual Ash Monofill Inspection Report (AECOM, 2016a), the geologic setting at Rawhide lies on the high plains located immediately east of the Colorado Front Range, where soil and bedrock units are incised by drainage from nearby mountains to the west, forming small, relatively minor valley and ridge topographic expressions. Elevations within the project area range from about 5,580 to 5,805 feet above mean sea level. The most distinctive topographic feature at Rawhide is a broad basin that occupies the center of the site and extends from northwest to southeast. Smooth ridges and rounded bluffs surround this basin and mark the transition to uplands that are 50 to 70 feet higher. It is within this basin that the site for the CCR Monofill was selected.

According to the United States Geological Survey (USGS) geologic map, bedrock at Rawhide consists of Cretaceous units including the Upper Pierre Shale Formation. Specifically, the majority of the Rawhide site lies on the Upper Pierre Shale Formation transition zone, the eastern extent of which transitions to the Lower Fox Hills Sandstone downslope and east of the Rawhide site. The Pierre Shale transition zone is described as shale with interbedded sandstones. The portions 600 feet below the contact with the Fox Hills sandstone are mapped by the USGS as being the most permeable within the unit, yielding 5 to 15 gallons per minute in wells. The Fox Hills Sandstone is described as a pale yellow, massive, silty, fine-grained sandstone with lenticular black shale partings but is not present on the Rawhide site.

The bedrock surface at the site is mapped as dipping east-southeast toward the Cooling Pond. The geologic map indicates bedrock bedding structure in the area striking roughly north-south with shallow dips 5 to 10 degrees to the east. The Rawhide site is considered to be in an area of overall minor seismicity.

The hydrogeology at Rawhide is discussed in the Engineering Report and Operational Plan (PRPA, 1980) and in the *Final Report Investigation of the Groundwater Monitoring Program for the Bottom Ash Disposal Site* (Lidstone & Anderson, 1989). Data indicates that a groundwater table exists within the Pierre Shale bedrock below the site and in surficial deposits along Coal Creek. The Lidstone & Anderson report explained depth to groundwater varied across the site from 11 to 67 feet and follows a general gradient to the south-southeast. The shallow water table was determined to be directly recharged by infiltration from precipitation and surface runoff.

The Lidstone & Anderson report concluded that sufficient data was collected on the groundwater beneath the Rawhide site to determine a mound has formed in the shallow fractured Pierre Shale Aquifer in the vicinity of the Cooling Pond. After a review of available documents on the current water levels within the area, it was concluded that the CCR Monofill is hydraulically upgradient of any groundwater mound that may be created by the Cooling Pond, and groundwater mounding associated with the Cooling Pond would not affect the overall performance of the CCR Monofill (AECOM, 2016a).

Approximately two-thirds of the surface water at the Rawhide site drains to the Cooling Pond. The Cooling Pond is located on land that previously drainage to an unnamed tributary of Coal Creek, but this area no longer drains to this tributary. The remaining one-third of the surface water at the Rawhide site is drained by Coal Creek (as shown on **Figure 1**). Coal Creek flows intermittently depending on the amount of precipitation.

## 2.2 Site Soil

As discussed in the Annual Ash Monofill Inspection Report (AECOM, 2016a), soils at the site are mapped as Pleistocene pediment deposits consisting of arkosic sands and gravel with minor amounts of

red clay. More recent, relatively thin soils mantling the pediment deposits and bedrock in the area are likely wind-blown silts and clays.

According to the United States Department of Agriculture (USDA) Web Soil Survey (USDA, 2016), the CCR Monofill was constructed in an area consisting primarily of two soil types: Midway clay loam and Renohill-Midway clay loam. The Midway clay loam is well drained and the surface layer consists of clay loam, clay, silty clay loam to a depth of approximately four to 19 inches, under which is weathered bedrock. Permeability of the soil is moderately low to moderately high (0.06 to 0.20 inches per hour [in/hr]) and the available water storage capacity is moderate. The Renohill-Midway clay is well drained and the surface layer consists of clay loam, clay, and silty clay loam to a depth of approximately four to 27 inches, under which is weathered bedrock. Permeability of the soil is moderately low to moderately high (0.06 to 0.20 in/hr) and the available water storage capacity is moderate. Tests conducted on similar Rawhide site soils indicate a permeability of approximately $1 \times 10^{-3}$ centimeters per second [cm/sec] to $1 \times 10^{-8}$ cm/sec (PRPA, 1980).

## 2.3 Current Conditions

The current CCR Monofill extent, along with topography provided by PRPA, is shown on **Figure 2,** and includes two adjoining cells. Cell 1 of the CCR Monofill has been filled and is currently inactive. Maximum side slopes are 4H:1V (Horizontal:Vertical). Cell 1 has been covered with a minimum two-foot thick earthen cover. The material used for the cover was obtained from the stripping actives conducted when the active area was prepared for the placement of solid waste. Cell 1 has also been drill seeded with a seed mix containing western wheatgrass, intermediate wheatgrass, blue gramma, buffalo grass, and little blue steam (PRPA, 1980). Although Cell 1 is currently covered with a thick stand of grass, it was never officially considered final closure by the State of Colorado. Per the Revised Design and Operations Plan for the Solid Waste Disposal Facility (Smith Geotechnical [Smith], 2007), PRPA stopped filling Cell 1 before it had reached the full extent authorized by the original Engineering Report and Operational Plan for the Solid Waste Disposal Facility (PRPA, 1980) to avoid disrupting the views of the neighbors. However, if additional storage capacity is needed in the future, filling operations may resume in Cell 1. For the purpose of this Closure Plan, it is assumed that the maximum permitted extent of Cell 1 (which extends further north than the current extent), will contain waste at the time of closure.

Cell 2 adjoins immediately on the west side of Cell 1 and is currently in the process of being filled (filling operations began in 2008). Solid waste placement started in the southernmost part of Cell 2 behind a containment dike and progressively moves north in the area planned to receive solid waste. Per the Revised Design and Operations Plan for the Solid Waste Disposal Facility (Smith, 2007), prior to the placement of waste in the CCR Monofill topsoil is removed from the active area and stockpiled nearby for reclamation activities and daily cover.

## 2.4 Estimated Capacity

As required by 40 CFR 257.102(b), the maximum inventory of CCR ever on-site over the active life of the CCR unit is estimated to be approximately 3,290 acre-feet (1,670 acre-feet in Cell 1 and 1,620 acre-feet in Cell 2) and the largest area of the CCR unit ever requiring a final cover at any time during the CCR unit's active life is estimated to be approximately 123 acres (62 acres in Cell 1 and 61 acres in Cell 2) (Smith, 2007 and PRPA, 1980).

# 3.0 Final Cover System Design

Closure of the CCR Monofill will be completed by leaving the CCR in place and installing a final cover system. In accordance with 40 CFR 257.104(d), the final cover will ensure that the CCR Monofill is closed in a manner that will:

- control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;
- preclude the probability of future impoundment of water, sediment, or slurry;
- include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;
- minimize the need for further maintenance of the CCR unit; and
- be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

These performance standards will be met through construction of a final cover (see Section 3.1), proper sloping to preclude impoundment of water and provide stability (see Section 3.3), settlement monitoring (see Section 3.4), quality control during installation (see Section 4.4), and scheduling (see Section 5.0).

## 3.1 Conventional Cover Design

Conventional final cover designs for solid waste sites rely on hydraulic barrier layers. The following conventional cover components are consistent with the Final CCR Rule:

- Infiltration Layer - The infiltration of liquids through the closed CCR Monofill will be minimized by the use of an infiltration layer that contains a minimum of 18 inches of earthen material. The earthen material will have a permeability that is less than or equal to the permeability of the bottom liner system or natural subsoils present, or a permeability no greater than $1 \times 10^{-5}$ centimeters per section (cm/sec), whichever is less. The CCR Monofill does not have a bottom liner. Also, as discussed above in Section 2.2, the permeability of the natural subsoil appears to be in the range of approximately $1 \times 10^{-3}$ cm/sec to $1 \times 10^{-8}$ cm/sec.
- Erosion Layer - Erosion of the final cover system will be minimized by the use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth.

A conceptual cross-section of the conventional final cover is shown within **Figure 3**.

## 3.2 Borrow Soil

Per the Revised Design and Operations Plan for the Solid Waste Disposal Facility (Smith, 2007), the material used for the cover will be obtained from the stripping activities conducted when the active area was prepared for the placement of solid waste. If additional soil is required, supplementary sampling and geotechnical analysis will be required prior to borrow soil use to ensure permeability requirements are met. In addition, all borrow sources will be appropriately permitted prior to use and revegetated following use.

## 3.3 Final Contours / Stability

The estimated final contours at closure are shown on **Figure 3**. The final grades on the side slopes of the CCR Monofill will be no greater than 4:1 (H:V) and the final grades on the top of the CCR Monofill will

crowned with a slope of no less than 20:1 (H:V). These grades will promote surface water run-off, preclude the future impoundment of water, and minimize erosion.

AECOM performed a stability inspection of the CCR Monofill in March 2016 and presented the results of a stability analysis within a May 6, 2016 letter to PRPA (AECOM, 2016d). The results of the stability analysis show that the calculated factors of safety meet or exceed the minimum recommended factor of safety for global embankment stability.

### 3.4 Settling / Subsidence

The disruption of the integrity of the final cover system will be minimized through a design that accommodates settling and subsidence. If a permanent survey benchmark does not already exist at the site, one will be constructed in a location outside the limits of the CCR Monofill that is not expected to experience settlement during the post-closure period. In addition, settlement monuments will be located within the limits of the CCR Monofill for post-closure monitoring of the final cover. After installation of the survey benchmark and settlement monuments, a baseline survey reading will be taken as a reference point.

### 3.5 Revegetation

The final cover will be seeded according to Section 3.1 of the original Engineering Report and Operational Plan (PRPA, 1980). The specific seed mix that will be used on the final cover will consist of western wheatgrass, intermediate wheatgrass, blue gramma, buffalo grass, and little bluestem. The goal will be to obtain a good stand of grass with a dense root structure.

If necessary to support the final cover, commercial fertilizer (or other soil amendments) can be incorporated into the seedbed prior to seeding of permanent species. The permanent perennial seeding should consist of both cool- and warm-season native grasses that are tolerant to drought and adaptable to fine-textured clay soils.

Straw mulch will be applied and anchored with a straw crimper to promote plant germination and growth by decreasing soil surface temperature, conserving soil moisture, and controlling erosion from wind and water run-off.

# 4.0 Final Cover System Installation Methods/Procedures

Detailed design drawings and construction specifications will be developed prior to closure. However, some of the methods/procedures during installation are discussed in this section.

## 4.1 Temporary Erosion / Sediment Control

Measures will be implemented to control erosion and sediment during closure. Temporary perimeter sediment controls may include silt fence, berms, diversion channels, and/or sediment traps. Temporary erosion controls on the 4:1 (H:V) side slopes may include erosion control blankets and/or rows of wattles placed perpendicular to the slope. Temporary controls will be removed upon establishment of vegetation.

## 4.2 Permanent Run-on / Run-off Control

Permanent run-on / run-off controls during closure and continuing into post-closure will be in accordance with the most recently updated version of the Run-on and Run-off Control System Plan (AECOM, 2016c). Run-on and run-off control features will ensure the long-term integrity of the final cover system.

## 4.3 Dust Control

To minimize fugitive dust due to vehicle travel or winds, a water truck will be used at the facility to wet down the disposal area, unpaved roads, stockpiles, and traveled areas. Dust control will be in accordance with the Dust Control Plan for the Rawhide Energy Station (PRPA, 2015).

## 4.4 Quality Control

Construction Quality Assurance (CQA) is the process by which the engineer, contractor, and owner ensure conformity with project drawings and specifications. As part of the CQA program, a Construction Quality Assurance Plan (CQAP) will be prepared (prior to start of construction) to outline the quality assurance/quality control (QA/QC) process. The CQAP will include:

- roles and responsibilities of the project team and contractors during project construction;
- description of the detail required for project documentation; and
- a discussion of the QA/QC methods for soils and all imported materials.

Inspections and testing will be performed throughout the construction process and initial grades and thickness of each layer will be verified with survey elevations taken before and after placement.

# 5.0 Closure Schedule

As required by 40 CFR 257.102(b), the following is an estimated/draft schedule for completion of all activities related to design and construction of a final cover at the CCR Monofill. The schedule will be refined and details added prior to closure.

| Closure Task | Approximate Month/Year/Schedule |
|---|---|
| Prepare initial written closure plan | October 17, 2016 |
| Perform additional modeling (if needed) and prepare detailed closure plan (with revised schedule) | Between 270 and 180 days prior to beginning closure activities |
| Prepare notification of intent to close | Approximately 1 month prior to beginning closure activities. |
| Coordinate with agencies and obtain necessary approvals and permits | Prior to beginning closure activities. Approximately 3 to 6 months. |
| Installation of the final cover system | Approximately 2040 (according to Revised Design and Operations Plan [Smith, 2007]) when CCR Monofill reaches capacity (will commence according to schedule below) |
| Preparation of foundation | Estimated to take approximately 2 weeks |
| Placement of infiltration layer | Estimated to take approximately 4 months |
| Placement of erosion layer | Estimated to take approximately 1 month |
| Final cover seeding | Estimated to take approximately 2 weeks |
| All closure activities for the CCR Monofill are completed | Within 6 months of commencing closure activities |
| Prepare a notification of closure | Within 30 days of completing closure activities |

Closure of the CCR Monofill will occur when the facility has reached capacity, or when operations at Rawhide no longer warrant on-site disposal of the waste materials as detailed in Section 1.1, above. In accordance with 40 CFR 257.102(e), closure of the CCR Monofill will commence within two years of the last receipt of CCR (or last removal of CCR for beneficial use) or no later than 30 days after the date on which the CCR Monofill receives the known final receipt of CCR (or removes the known final volume of CCR for beneficial use). PRPA may obtain two-year extensions provided that they continue to be able to demonstrate that there is reasonable likelihood that the CCR Monofill will accept wastes in the foreseeable future or will remove CCR from the Landfill for the purpose of beneficial use.

In accordance with 40 CFR 257.102(f), PRPA will complete closure of the CCR Monofill within six months of commencing closure activities. This timeframe may be extended, however, if PRPA can demonstrate that it is not feasible to complete closure of the CCR Monofill within the required timeframe due to factors beyond the facility's control. If PRPA seeks a time extension, a demonstration, including a narrative discussion providing the basis for additional time, will be completed.

# 6.0 Post-Closure Care

Once closure of the CCR Monofill has been completed in accordance with this plan and closure has been deemed adequate, the post-closure period begins. During post-closure, the CCR Monofill will be inspected and maintained to ensure that vegetation is property established and erosion and settlement do not compromise the final cover system. As-needed maintenance may include such items as repair of areas damaged by erosion, reseeding, removal of any invasive or woody plants, and other related tasks. Post-closure activities may also include long-term groundwater monitoring to verify groundwater quality has not been impacted. Post-closure care will be as described in the CCR Monofill Post-Closure Plan (AECOM, 2016b).

# 7.0 Amendment, Recordkeeping, and Notification

## 7.1 Amendment of the Plan

As required by 40 CFR 257.102(b)(3), PRPA may amend this Closure Plan at any time provided the revised plan is placed in the facility's operating record. PRPA will amend this plan whenever there is a change in operation of the CCR Monofill that would substantially affect the plan and if unanticipated events necessitate a revision of this plan (either before or after closure activities have commenced). PRPA will amend this plan at least 60 days prior to a planned change in the operation of the CCR Monofill, or no later than 60 days after an unanticipated event requires the need to revise this existing plan. If this plan is revised after closure activities have commenced for the CCR Monofill, PRPA will amend the plan no later than 30 days following the triggering event. Any amendment of this plan will be certified by a qualified professional engineer.

## 7.2 Recordkeeping

PRPA will maintain this Closure Plan, any subsequent revisions/amendments of this Closure Plan, inspection reports, documentation of maintenance, and other pertinent documents within the facility's operating record for a period of at least five years in accordance with 40 CFR 257.105.

## 7.3 Notification

PRPA will notify CDPHE whenever the Closure Plan (along with any subsequent updates) has been placed in the operating record in accordance with the notification requirements specified in 40 CFR 257.106. Prior to initiation of closure, PRPA will prepare a notification of intent to close the CCR Monofill. The notification will include a written certification from a qualified professional engineer stating that the design of the final cover system meets the requirements of this plan. Within 30 days of completion of closure of the CCR Monofill, PRPA will prepare a notification of closure for the CCR Monofill. The notification will include a written certification from a qualified professional engineer verifying that closure has been completed in accordance with this closure plan.

### 7.3.1 Deed Notations

Following closure of the CCR Monofill and in accordance with 40 CFR 257.102(i), PRPA will record a notation on the deed to the property, or some other instrument that is normally examined during title search. The notation on the deed will in perpetuity notify any potential purchaser of the property that the land has been used as a CCR Monofill and its use is restricted. Within 30 days of recording a notation on the deed to the property, PRPA will prepare a notification stating that the notation has been recorded.

# 8.0 Certification

**Certification Statement 40 CFR § 257.102(d)(3)(iii)** – Design of the Final Cover System for Closure of the Coal Combustion Residuals (CCR) Monofill, Rawhide Energy Station, Wellington, Colorado

**CCR Unit** – Platte River Power Authority, Rawhide Energy Station, CCR Monofill

I, Emily J. Nebel, being a Registered Professional Engineer in good standing in the State of Colorado, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the design of the final cover system as included in the CCR Monofill Closure Plan dated October 17, 2016 meets the requirements of 40 CFR § 257.102.

Emily J. Nebel
*Printed Name*

October 17, 2016
*Date*

# 9.0 References

AECOM. 2016a. Annual Ash Monofill Inspection Report, Platte River Power Authority, Rawhide Station. April, 2016.

AECOM. 2016b. Coal Combustion Residuals (CCR) Monofill Post-Closure Plan, Rawhide Energy Station, Fort Collins, Colorado. October, 2016.

AECOM. 2016c. Coal Combustion Residuals (CCR) Monofill Run-on and Run-off Control System Plan, Rawhide Energy Station, Fort Collins, Colorado. October, 2016.

AECOM. 2016d. Platte River Power Authority – Rawhide Residual Solid Waste Ash Monofill Stability Evaluation. May 6, 2016.

Colorado Department of Public Health and Environment (CDPHE). 2015. Hazardous Materials and Waste Management Division. 6 Code of Colorado Regulations 1007-2, Part 1, Regulations Pertaining to Solid Waste Sites and Facilities, Effective June 30, 2015.

Lidstone & Anderson. 1989. Investigation of the Ground-Water Monitoring Program for the Bottom Ash Disposal Site. March, 1989.

Platte River Power Authority (PRPA). 1980. Engineering Report and Operational Plan for the Solid Waste Disposal Facility. Rawhide Energy Project. Platte River Power Authority. December, 1980.

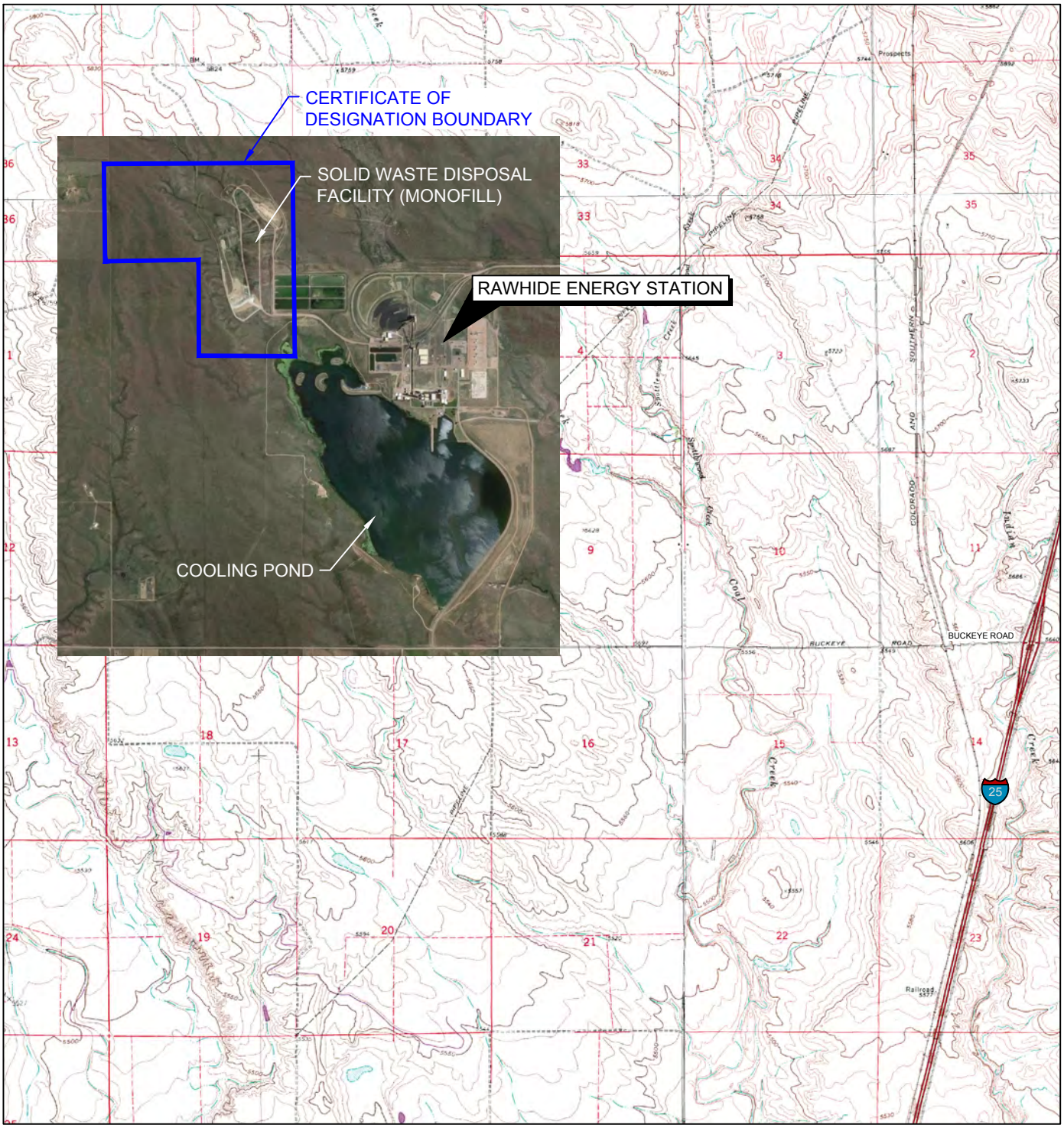
PRPA. 2015. Dust Control Plan. Rawhide Energy Station. Platte River Power Authority. October 2015.

Smith. 2007. Revised Design and Operations Plan for the Solid Waste Disposal Facility. Rawhide Energy Station. Smith Geotechnical. November, 2007.

United States Department of Agriculture (USDA). 2016. Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed August 25, 2016.

United States Environmental Protection Agency (USEPA). 2015. 40 CFR Parts 257 and 261 Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. Federal Register, v.80, no. 74, April 17, 2015, 201 pp.

# Figures




Last saved by: SCHWARTZE(2016-10-12) Last Plotted: 2016-10-12
Filename: \\USFCO4FP001\DATA\WORKING\PLATTE RIVER POWER AUTHORITY\900-CAD\06-FIGURES\RES-CLOSE PLAN_1_LOCATION MAP.DWG
Project Management Initials: Designer:____ Checked:____ Approved:____ ANSI A 8.5" x 11"

**Solid Waste Disposal Facility Closure Plan**

Platte River Power Authority, Fort Collins CO
Project No.: 60514657 Date: 10/12/16

**SITE LOCATION MAP**

AECOM

**Figure: 1**

Last saved by: SCHWARTZE(2016-10-12) Last Plotted: 2016-10-12
Filename: \\USFCO4FP001\DATA\WORKING\PLATTE RIVER POWER AUTHORITY\900-CAD\06-FIGURES\RES-CLOSE PLAN_2_CURRENT CONDITIONS.DWG

Project Management Initials: Designer: E.S.S. Checked: K.R. Approved:_____ ANSI B 11" x 17"

EXTENT OF 2016 SURVEY BOUNDARY

ASH-01 OLD

NOTE: 2012 (CELL 1) AND 2015 (CELL 2) SURFACE TOPOGRAPHY DATA PROVIDED BY PLATTE RIVER POWER AUTHORITY. AREA AROUND MONITORING WELL ASH-01 OLD SURVEYED IN 2016. ALL OTHER TOPO GENERATED FROM USGS DEM MODEL

IMAGE SOURCE: Bing Maps, 2016
IMAGE DATE: JUNE, 2014

GRAVEL PIT

FUTURE CELL 2

COMPLETED CELL 1

DRAINAGE CHANNEL

BERM TO EL. 5701

ACTIVE FACE

COMPLETED CELL 2

12" STEEL CULVERT

16" CONCRETE CULVERT

ASH-03

ASH-04

ASH-05

DRAINAGE CHANNEL

N

150 0 300

1"=300'

LEGEND

MONITORING WELL

ASH-03

DRAINAGE CHANNEL

APPROX. CELL LIMITS

CULVERT LOCATION

EXISTING GROUND SURFACE CONTOUR (FT. AMSL)

MAJOR CONTOUR

MINOR CONTOUR

CONTOUR INTERVAL = 2'

**Solid Waste Disposal Facility Closure Plan**

Platte River Power Authority, Fort Collins CO
Project No.: 60514657 Date: 10/12/16

**SOLID WASTE DISPOSAL FACILITY**
**CURRENT CONDITIONS**

AECOM

**Figure: 2**

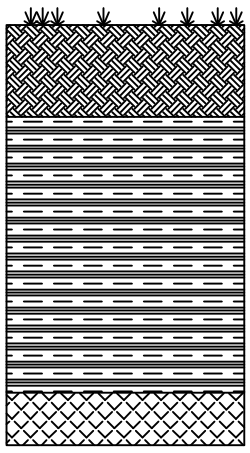
Last saved by: SCHWARTZE(2016-10-12) Last Plotted: 2016-10-12
Filename: \\USFCO4FP001\DATA\WORKING\PLATTE RIVER POWER AUTHORITY\900-CAD\06-FIGURES\RES-CLOSE PLAN_3_CLOSURE PLAN.DWG

Project Management Initials: Designer: E.S.S. Checked: K.R. Approved:_____ ANSI B 11" x 17"

NOTE: 2012 (CELL 1) AND 2015 (CELL 2) SURFACE TOPOGRAPHY DATA PROVIDED BY PLATTE RIVER POWER AUTHORITY. AREA AROUND MONITORING WELL ASH-01 OLD SURVEYED IN 2016. ALL OTHER TOPO GENERATED FROM USGS DEM MODEL

IMAGE SOURCE: Bing Maps, 2016
IMAGE DATE: JUNE, 2014

CONVENTIONAL FINAL COVER DESIGN
TYPICAL CROSS SECTION




ASH-01 OLD
GRAVEL PIT
FUTURE CELL 2
COMPLETED CELL 1
DRAINAGE CHANNEL
COMPLETED CELL 2
ASH-04
ASH-03
16" CONCRETE CULVERT
ASH-05
12" STEEL CULVERT
DRAINAGE CHANNEL

N
150 0 300
1"=300'

LEGEND
5710 CONCEPTUAL FINAL GRADE CONTOURS (CONTOUR INTERVAL = 10')
ASH-03 MONITORING WELL
DRAINAGE CHANNEL
APPROX. CELL LIMITS
CULVERT LOCATION
EXISTING GROUND SURFACE CONTOUR (FT. AMSL)
MAJOR CONTOUR
MINOR CONTOUR
CONTOUR INTERVAL = 2'

**Solid Waste Disposal Facility Closure Plan**

Platte River Power Authority, Fort Collins CO
Project No.: 60514657 Date: 10/12/16

**SOLID WASTE DISPOSAL FACILITY**
**CONCEPTUAL CLOSURE GRADING PLAN**

AECOM

**Figure: 3**