City Water, Light & Power
Ash Impoundments
Springfield, Sangamon County, Illinois

Closure Plan for Coal Combustion Residuals Surface Impoundments

October 2016

Prepared for:
City Water, Light & Power
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APPENDICES

1. INTRODUCTION

City Water, Light and Power (CWLP) ash ponds are coal combustion residuals (CCR) surface impoundments, which include both the Lakeside and Dallman ash ponds. The locations of these CCR units are shown in Appendix A of this Plan. This closure plan was prepared according to the requirements under 40 CFR Part 257.102:

> *257.102 (b)(2) No later than October 17, 2016, the owner or operator of the CCR unit must prepare an initial written closure plan consistent with the requirements specified in paragraph (b)(1) of this section.*

The closure for Lakeside Ash Pond and the Dallman Ash Pond will be accomplished by leaving CCR in place. The closure of both ponds will contain the following elements:

- Drainage/dewatering of ash ponds
- Stabilization of CCR
- Structural fill, if necessary
- Final cover system

Details of these items are discussed in the following sections. This plan may be revised at any time as allowed under 40 CFR Part 257.102 (b)(3). Amendments to this plan will be required if and when any significant changes occur to the operation of the CCR units that would substantially affect this plan, or unanticipated events necessitate a revision of this plan. This plan must be amended at least 60 days prior to a planned change in operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise this closure plan.

2. CLOSURE PLAN

2.1 Drainage/Dewatering

Free liquids will be removed from the ash ponds by utilizing existing pumping structures that will remove the liquids to an existing clarification pond, located to the south of the Dallman Ash Pond. Water will eventually be discharged by permitted NPDES Outfall 004. The dewatering will be monitored for effectiveness and other methods employed to complete the process if determined to be necessary. Vegetation existing inside the pond will be removed during this process.

2.2 CCR Material Stabilization

After fee liquids and vegetation are removed from the ash ponds, CCR materials within the inactive Fly Ash Pond will be stabilized by grading and compacting to minimize the probability of future impoundment of water or sediment due to settlement. Grading and compacting the CCR materials will also provide slope stability to prevent sloughing or movement of the final cover system. Grading design plans and compaction specifications for CCR material stabilization will be developed during the final engineering design, but will likely include a minimum slope of one to two percent to promote surface drainage. Structural fill may be added above the CCR material to provide sufficient slope for the final cover system.

2.3 Final Cover System

The preliminary design of the final cover system for the Ash Ponds will meet the requirements of 40 CFR 257.100(d)(3)(i). In order to meet these requirements, the final cover design will contain the following elements:

2.3.1 Low Permeability Layer

A low permeability compacted soil layer with a maximum permeability of $1x10^{-5}$ cm/sec will be placed. This low permeability layer will be at least 18 inches thick and will minimize the infiltration of liquids through the CCR units. Material to be used for the compacted low permeability soil layer will be Unified Soil Classification System types ML, CL, or CH. The source of cover material will be from onsite stockpiles and nearby borrow areas.

The compacted soil layer is to be placed in lifts not to exceed eight inches (8-inches loose). The low permeability layer will be compacted with a sheepsfoot roller or a self-propelled soil compactor. Each layer will be worked sufficiently to breakdown oversized clods, obtain a uniform moisture content and ensure uniform density as needed. The soil material will be placed at a moisture content above optimum and recompacted to at least 95-percent Standard Proctor density (ASTM D698) to achieve a hydraulic conductivity of $1.0x10^{-5}$ cm/sec.

Three-inch diameter Shelby tube samples shall be taken from the compacted soil layer and subsequent tests shall be completed in accordance with the Flexible Walled Permeameter (ASTM D5084) to verify the permeability of the compacted low permeable soils. Nuclear density tests and Field Moisture Tests (ASTM D6938) will be completed to confirm appropriate moisture and compaction of the soil material. All voids generated as a result of the Shelby tube sampling will be backfilled with hydrated bentonite to maintain competency of the compacted soil layer. Proctor samples will be taken in accordance with the proposed Construction Quality Assurance Plan (Section 2.3).

Roots, cobbles, debris, organic, and other deleterious material will be removed from the soil material prior to compaction. Cover thickness documentation will be conducted separately for the compacted soil layer and the final protective layers, by boring locations selected utilizing a 100-foot grid (for the earthen low permeability layer component only) or by topographic surveying prior to and after placement of final cover system components. Areas disturbed by borings will be filled with a mixture of bentonite and cover spoil.

Material to be used for the compacted low permeability soil layer will be Unified Soil Classification System types ML, CL, or CH. The source of cover material will be from onsite stockpiles and borrow areas. Adequate records are available from past testing to demonstrate that this material can achieve a maximum permeability of 1.0×10^{-5} cm/sec when compacted.

Testing of the earthen component of the low permeability layer will be done to fulfill these frequencies on a minimum basis:

Testing Parameter	Test Method	Min. Testing Frequency
Nuclear Density (Including Moisture Content)	ASTM D6938	5 test/Acre Lift
Atterberg Limits	ASTM D4318	1 test/10,000 yd^3
Grain Size Distribution	ASTM D422	1 test/10,000 yd^3
Standard Proctor Density	ASTM D698	1 test/10,000 yd^3
Laboratory Permeability	ASTM D5084	1 test/10,000 yd^3

2.3.2 Erosion Layer

An erosion layer containing a minimum of 6 inches of soil capable of sustaining plant growth will overlie the low permeable layer. The soil used for the erosion layer should not be compacted and should be the best onsite readily available soil for supporting vegetation. Shallow-rooted grasses and legumes should be used to establish a vegetative growth for erosion control. The mixture of grasses and legumes selected must be amenable to the soil quality and thickness, slopes, moisture, and climatological conditions that exist without the need for continued maintenance.

Lime, fertilizer, and any other appropriate soil amendments, may be incorporated into the erosion layer at application rates determined from composite soil tests of the area to be seeded. Mulch consisting of straw, yard waste compost, jute, and/or wood excelsior may be used as necessary to hold the seed in place and conserve moisture. A professional knowledgeable in vegetation establishment will be consulted for determining the specific seed mixtures to be sown, suitable soil amendments, and application rates based upon specific seasonal conditions at the time of placement.

2.3.3 Final Grading Design

A final grading design will be implemented that accommodates the anticipated amount of settling and/or subsidence of the CCR materials, as well as any structural fill placed in the CCR units. The thickness of CCR materials remaining in the Ash Ponds will be estimated. Published parameters for similar CCR materials or laboratory results of analysis performed on CCR samples taken from the Ash Ponds will be used to determine the appropriate slopes required to maintain sufficient drainage in order to minimize infiltration of liquids through the CCR units.

3. CCR INVENTORY ESTIMATES

The maximum inventory of CCR ever on site for the active life of the Lakeside Ash Pond is estimated to be equivalent to the current inventory of CCR in that unit. According to CWLP personnel, the Lakeside Ash Pond currently has an approximate impounded CCR volume of 1,080,000 cubic yards. Therefore, premature closure or closure near the end of regulatory life of the facility will be essentially the same. There is no need to provide a separate premature closure plan.

The storage capacity for the Dallman Ash Pond is 1,100,000 cubic yards. The Dallman Ash Pond currently has an approximate impounded CCR volume of 978,000 cubic yards, approximately 28,000 cubic yards of which is piled up above the normal water elevation that is being dried out for beneficial reuse. The maximum inventory of CCR ever on site for the active life would not exceed the 1,100,000 cubic yard storage capacity.

4. FINAL COVER AREA

It is assumed that the entire area of the ash ponds represents the largest area that will require a final cover system, as described in Section 2.3 of this report. Under these assumptions, the Lakeside Ash Pond will require a final cover system of approximately 27.6 acres, and the Dallman Ash Pond will require a final cover system of approximately 34.5 acres.

5. CLOSURE SCHEDULE

Closure of each Ash Pond will occur when the CCR unit is considered inactive, as determined by CWLP. The closure process will commence no later than 30 days after the date on which the CCR unit receives the known final receipt of CCR, or removes the final volume of CCR from the CCR unit for the purpose of beneficial use. If the final receipt of CCR is not known, then the closure process must still commence if the CCR unit has not received CCR material, or has not had CCR material removed from it for a duration of two years, unless it can be demonstrated that the idle unit will resume to receive or remove CCR materials in the foreseeable future.

The general sequence and timing of closure activities identified below will be applied to the closure of each Ash Pond as follows:

Season 1 – Initiation of the closure process

- Final engineering design
- Dewatering of CCR materials
- Remove existing vegetation
- Initial grading and compaction of CCR materials

Season 2 – Beginning one year after initiation of closure process

- Complete grading of CCR materials
- Add and grade structural fill, if necessary
- Construction of final cover system

Season 3 – Beginning two years after initiation of closure process

- Complete construction of final cover system, if necessary

6. NOTICES AND REPORTS

6.1 Closure Notices

In accordance with 40 CFR 257.102(c), the following closure documentation will be completed and placed in the CWLP's CCR operating record and on the CWLP website:

- Notification of Intent to Close (Due on the date of the initiation of closure)
- Notification of Completion of Closure (30 days after completion of closure activities)
    - Will include a certified Construction Acceptance Report

6.2 Construction Acceptance Report

Both the Operator and a Professional Engineer (Engineer) must certify that closure is in accordance with the closure plan. Therefore, the Engineer should be retained at the outset of the closure process so that all aspects of the closure can be overseen. The Engineer will need to spend sufficient time on site to ensure adequate cover quality and thickness as well as proper completion of the other tasks. Furthermore, the Engineer will conduct testing to meet the requirements of the final cover design. The Engineer's services will include the preparation of plan sheets showing the final conditions at the closed site.

6.3 Deed Notations

Following the closure of all units, the owner or operator will record a notation on the deed to the landfill property, or some other instrument that is normally examined during title search. Within 30 days of the deed notation, a notification that the notation has been recorded and a copy will be placed in the operating record, and posted on the CWLP's website. The notation on the deed will in perpetuity notify any potential purchaser of the property that the land has been used as a CCR unit and its use is restricted under 40 CFR 257.104(d)(1)(iii).

7. STATEMENT

This Closure Plan for Coal Combustion Residuals Surface Impoundments was completed for CWLP by Andrews Engineering, Inc. in accordance with the requirements under 40 CFR Part 257.102.

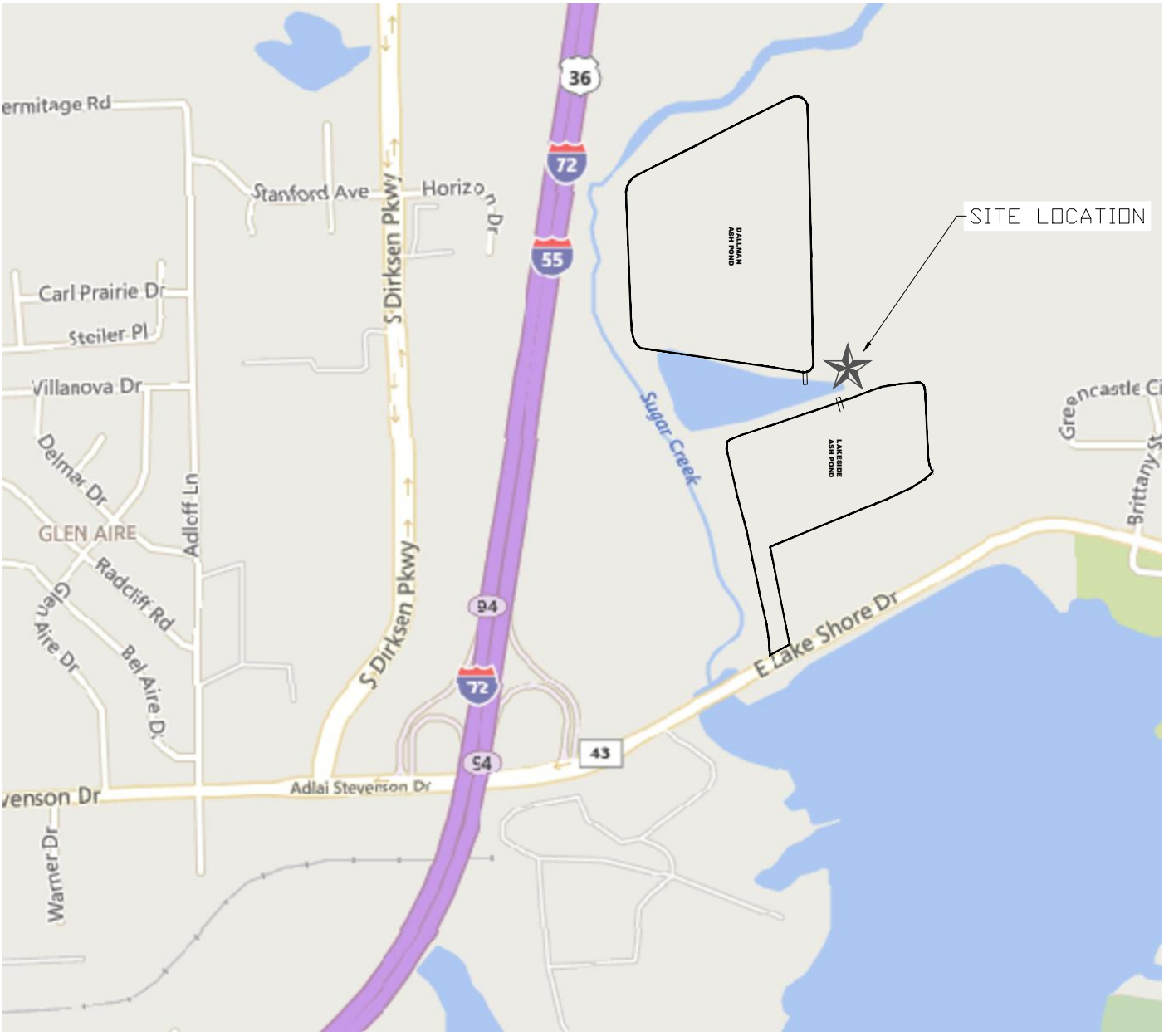
Paul M. Van Metre, P.E.

10-14-2016
Date

APPENDIX A

Site Map

J:\S\Springfield CWLP\CWLP\dwg\SURFACE IMPOUNDMENTS.dwg Tab: FIGURE 1



SITE LOCATION

N

0 500 1000 2000

SCALE: IN FEET

NOTE:
BASE IMAGE DERIVED FROM BING

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APPROVED BY: PMV | DESIGNED BY: PMV | DRAWN BY: RMC

SITE LOCATION MAP

PLANS PREPARED FOR

CWLP

SPRINGFIELD, SANGAMON COUNTY, ILLINOIS

DATE: OCTOBER 2016

PROJECT ID: 150077/0011

SHEET NUMBER:

FIG. 1

FIG. 2A

DATE: OCTOBER 2016

PROJECT ID: 150077/0011

SHEET NUMBER:

CWLP COAL COMBUSTION RESIDUALS SURFACE IMPOUNDMENTS

PLANS PREPARED FOR

CITY, WATER, LIGHT & POWER

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REVISIONS

NO.	DATE	DESCRIPTION	BY