

**CCR POST-CLOSURE PLAN
BIG BROWN STEAM ELECTRIC STATION
ASH DISPOSAL AREA II
FREESTONE COUNTY, TEXAS**

OCTOBER 2016

Prepared for:

LUMINANT GENERATION COMPANY, LLC
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Prepared by:

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PBW Project No. 5196C

PROFESSIONAL CERTIFICATION

This document and all attachments were prepared by Pastor, Behling & Wheeler, LLC under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that this Post-Closure Plan has been prepared in accordance with the requirements of Section 257.104 of the CCR Rule.



Patrick J. Behling 10/05/16
Patrick J. Behling, P.E.
Principal Engineer
PASTOR, BEHLING & WHEELER, LLC

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1.0 INTRODUCTION

Luminant Generation Company, LLC (Luminant) operates the Big Brown Steam Electric Station (BBSES) located approximately 10 miles northeast of Fairfield, Freestone County, Texas (Figure 1). The BBSES consists of two coal/lignite-fired units with a combined operating capacity of approximately 1,150 megawatts. Coal Combustion Residuals (CCR) including fly ash, bottom ash and boiler slag are generated as part of BBSES unit operation. The CCRs are transported off-site for beneficial use by third-parties or are managed/disposed of by Luminant at the BBSES.

The CCR Rule (40 CFR 257 Subpart D - *Standards for the Receipt of Coal Combustion Residuals in Landfills and Surface Impoundments*) has been promulgated by the US Environmental Protection Agency (USEPA) to regulate the management and disposal of CCRs as solid waste under Resource Conservation and Recovery Act (RCRA) Subtitle D. The final CCR Rule was published in the Federal Register on April 17, 2015. The effective date of the CCR Rule was October 19, 2015.

The CCR Rule establishes national operating criteria for existing CCR surface impoundments and landfills, including development of post-closure plans (PCP) for all CCR impoundments and landfills. Pastor, Behling & Wheeler, LLC (PBW) was retained by Luminant to develop this post-closure plan for Ash Area Disposal Area II at BBSES.

1.1 CCR Landfill Post-Closure Care Requirements

40 CFR 257.104 of the CCR Rule specifies the post-closure care requirements for existing CCR units that have been closed in accordance with 40 CFR 257.102 of the Rule. Following closure of a CCR unit, the owner/operator must conduct post-closure care for the unit, consisting of at least the following:

- Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover; and
- Maintaining the groundwater monitoring system for the unit and monitoring the groundwater in accordance with the requirements of 40 CFR 257.90 through 257.98 of the CCR Rule.

Post-closure care must be conducted for 30 years after the CCR unit has been closed. If at the end of the 30-year post-closure care period, groundwater assessment monitoring is being performed at the unit in accordance with 40 CFR 257.95, post-closure care of the unit must continue until the unit has returned to groundwater detection monitoring under 40 CFR 257.95.

Once the post-closure care period has been completed, the owner/operator of the CCR unit must prepare a notification verifying that post-closure care has been completed. The notification must include certification by a qualified professional engineer verifying that post-closure care has been completed in accordance with the written closure plan for the unit. The notification must be placed in the facility operating record within 60 days of the completion of post-closure care.

Section 257.104(d) of the CCR Rule specifies that a written post-closure plan must be prepared for each existing CCR unit that describes the post-closure care activities for the unit. The post-closure plan must include, at a minimum, the following information:

- A description of the required post-closure monitoring and maintenance activities and the frequency at which these activities will be performed;
- The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period; and
- A description of the planned uses of the closed unit property during the post-closure period. Post-closure use of the property must not disturb the integrity of the final cover, liner, or any other component of the unit containment system, or the function of the monitoring systems.

If the owner/operator of the unit desires to disturb any of the components of the closure during the post-closure care period, a qualified professional engineer must certify that the disturbance of the final cover, liner or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The certification must be placed in the facility operating record and the Texas Commission on Environment Quality (TCEQ) must be notified.

The PCP must be certified by a qualified professional engineer and must document how the PCP has been designed and constructed to comply with the requirements of Section 257.104.

In accordance with 257.104(d)(2) of the CCR Rule, the initial PCP for an existing CCR unit must be completed and placed in the facility operating record no later than October 17, 2016. The PCP must be amended whenever:

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

The PCP 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 an existing PCP. If the PCP is revised after post-closure activities have commenced for a CCR unit, the PCP must be amended no later than 30 days following the triggering event. The owner or operator of the CCR unit must obtain a written certification from a qualified professional engineer that the initial and any amendment of the PCP plan meets the requirements of Section 257.104 of the CCR Rule.

1.2 BSES Units Subject to Post-Closure Plan Requirements

The only CCR unit at the BSES that meets the definition of a CCR landfill is the Ash Disposal Area II Landfill. Ash Disposal Area II consists of eleven existing landfill cells (Cells 1 through 11) and nine potential future landfill cells (Cells 12 through 20). Cells 1 through 11 are collectively considered an “existing landfill” under 40 CFR 257.53. The portion of Ash Disposal Area II consisting of Cells 12 through 20 will be considered a Lateral Expansion to an Existing Landfill and will be subject to the additional CCR Rule requirements for Lateral Expansions.

This PCP was prepared for the entirety of Ash Disposal Area II, including existing Cells 1 through 11 and future Cells 12 through 20. In accordance with 257.104 of the CCR Rule, the PCP must be amended in the future if construction of Cells 12 through 20 varies from the configuration described in this plan.

1.3 Description of the Ash Disposal Area II Landfill

The Ash Disposal Area II Landfill is located on the north side of the BSES approximately 5,000 feet northeast of the power plant (Figure 2). Ash Disposal Area II covers an area of approximately 240 acres and currently consists of ten closed or active landfill cells (Cells 1 through 10) on the eastern side and one landfill cell that has been constructed but not yet used (Cell 11). There are nine potential future landfill cells (Cells 12 through 20) on the western side. The Ash Disposal Area II landfill was registered with the Texas Commission on Environmental Quality (TCEQ) as a Class 2 non-hazardous industrial waste landfill in 1986 under Solid Waste Registration (SWR) No. 30080 (ERM, 1986). The landfill registration was amended in 2009 to include Cells 11 through 20 (HDR, 2009).

Ash Disposal Area II is constructed partially above and partially below grade and is surrounded by engineered earthen dikes that extend approximately 10 to 15 feet above surrounding grade. Existing Cells 1 through 11 have been constructed with a 3-foot thick compacted clay liner (TUGC, 1986; SWL, 1992). The surface areas of Cells 1 through 8 have been covered with either a permanent clay cap or a temporary soil cap (HDR, 2015). CCR placement is currently taking place in Cells 9 and 10.

As described in the CCR Closure Plan prepared for Ash Disposal Area II, Luminant plans to close the landfill in accordance with Section 257.102(d) of the CCR Rule by leaving CCR in-place and constructing a final cover system over the CCR located within the landfill (PBW, 2016). The proposed final grading plan for the final cover system is illustrated in Figure 3. Additional details regarding the final cover system are described in the CCR Closure Plan (PBW, 2016).

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2.0 POST-CLOSURE INSPECTION AND MAINTENANCE PLAN

Monitoring and maintenance activities will be performed to maintain the integrity and effectiveness of the final cover system as specified in 40 CFR 257.104(b)(1). During the post-closure monitoring and maintenance period at the site, the final cover of the closed CCR unit will be inspected at the frequency indicated in Table 1 below:

Table 1 – Post-Closure Care Maintenance

Post-Closure Care Maintenance Item	Frequency of Inspections	Types of Deficiency Conditions to be looked for during inspections
Final Cover Condition	Annually	Inspection for vegetation, erosion, settlement, ponding water, and functionality and the surface water drainage system
Vegetation	Annually	Erosion rills and depressions, vegetative stress
Drainage structures	Annually	Sediment and debris build up, component damage, blockages, erosion, ponding of water in non-designated areas, excessive vegetative growth

Each monitoring and maintenance activity will be documented and include the date, components and items monitored, name of the individual performing the monitoring/maintenance, a description of the deficiencies observed (if any), maintenance/repairs performed (if any), and related information.

At a minimum, maintenance will be performed as needed prior to the next scheduled inspection.

3.0 GROUNDWATER MONITORING

As specified in 40 CFR 257.104(3), groundwater monitoring activities will continue throughout the post-closure care period in accordance with 40 CFR 257.90 through 40 CFR 257.98. All groundwater monitoring wells that are part of the groundwater monitoring network will be monitored and maintained during the post-closure care period in accordance with the Groundwater Sampling and Analysis Plan, which will be finalized and placed in the Operating Record by October 17, 2017.

If at the end of the 30-year post-closure care period, groundwater assessment monitoring is being performed at the unit in accordance with 40 CFR 257.95, post-closure care of the unit must continue until the unit has returned to groundwater detection monitoring under 40 CFR 257.95.

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4.0 FACILITY CONTACT INFORMATION

Table 2: Contact Information

Name	Luminant - Environmental Services
Address	1601 Bryan St., Dallas, Texas 75201
Telephone Number	214-875-8654
Email	CCRPostClosurePlan@Luminant.com

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5.0 POST-CLOSURE LAND USE

Post-closure use of the property will not disturb the integrity of the final cover, liner system, or any other component of the containment system, or function of the monitoring system in accordance with §257.104(d)(1)(iii) unless necessary to comply with the maintenance requirements of this subpart or as otherwise provided as allowed under this subpart.

Post-closure land use is anticipated to be undeveloped/unchanged and the area will be deed recorded and deed restricted to prevent disturbance of the closed waste management unit.

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6.0 NOTIFICATION OF COMPLETION OF POST-CLOSURE CARE PERIOD

No later than 60 days following completion of the post-closure care period, a certification will be prepared by a qualified professional engineer verifying that the post-closure care has been completed in accordance with this Post-Closure Plan.

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7.0 REFERENCES

ERM-Southwest, Inc. (ERM), 1986. *Class II Landfill Registration and Technical Report - Texas Utilities Generating Company Big Brown Steam Electric Station, Fairfield, Texas*, December.

HDR Engineering, Inc. (HDR), 2015. Big Brown Ash Area II Final Cover Survey, July 29.

HDR, 2009. *Registration Amendment for Luminant Generation Company LLC Big Brown Steam Electric Station Ash Disposal Area II Registration #30080*. August 12.

Pastor, Behling & Wheeler, LLC (PBW), 2016. CCR Closure Plan – Big Brown Steam Electric Station, Ash Disposal Area II, Freestone County, Texas. October.

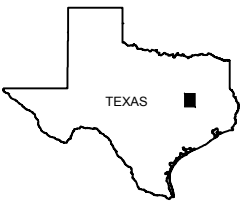
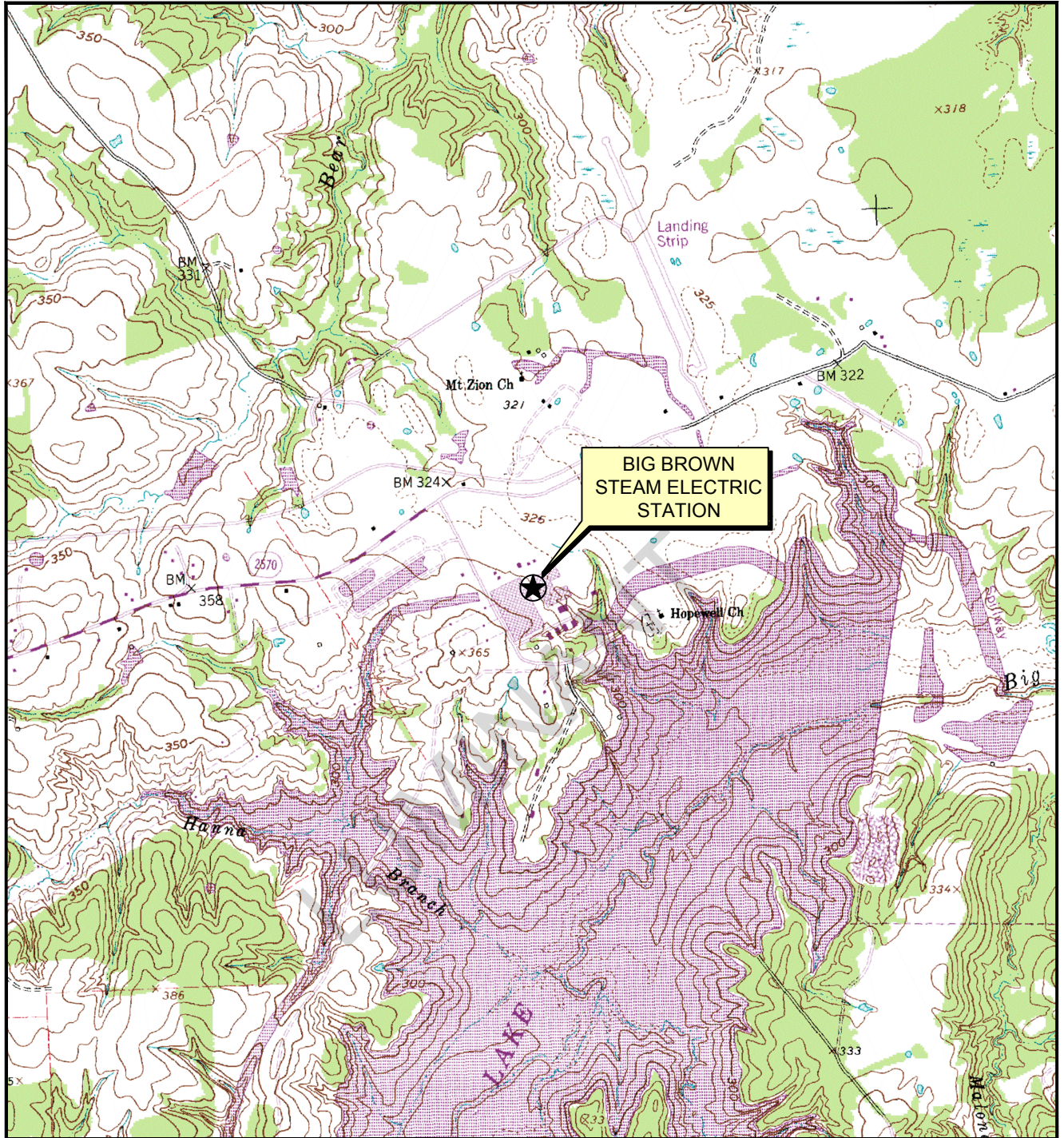
Southwestern Laboratories (SWL), 1992. *Big Brown Steam Electric Station Geotechnical Report for Design and Development of Ash Disposal Area 2 Expansion*. November 18.

Texas Utilities Generating Company (TUGC), 1986. Engineering Drawing 119-0035-301-02, Big Brown Steam Electric Station – Ash Disposal Area 2, November 12.

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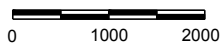
Figures



QUADRANGLE LOCATION



Scale in Feet



LUMINANT GENERATION COMPANY, LLC
BIG BROWN STEAM ELECTRIC STATION

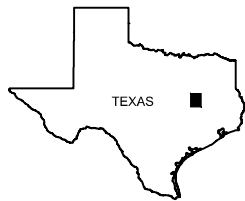
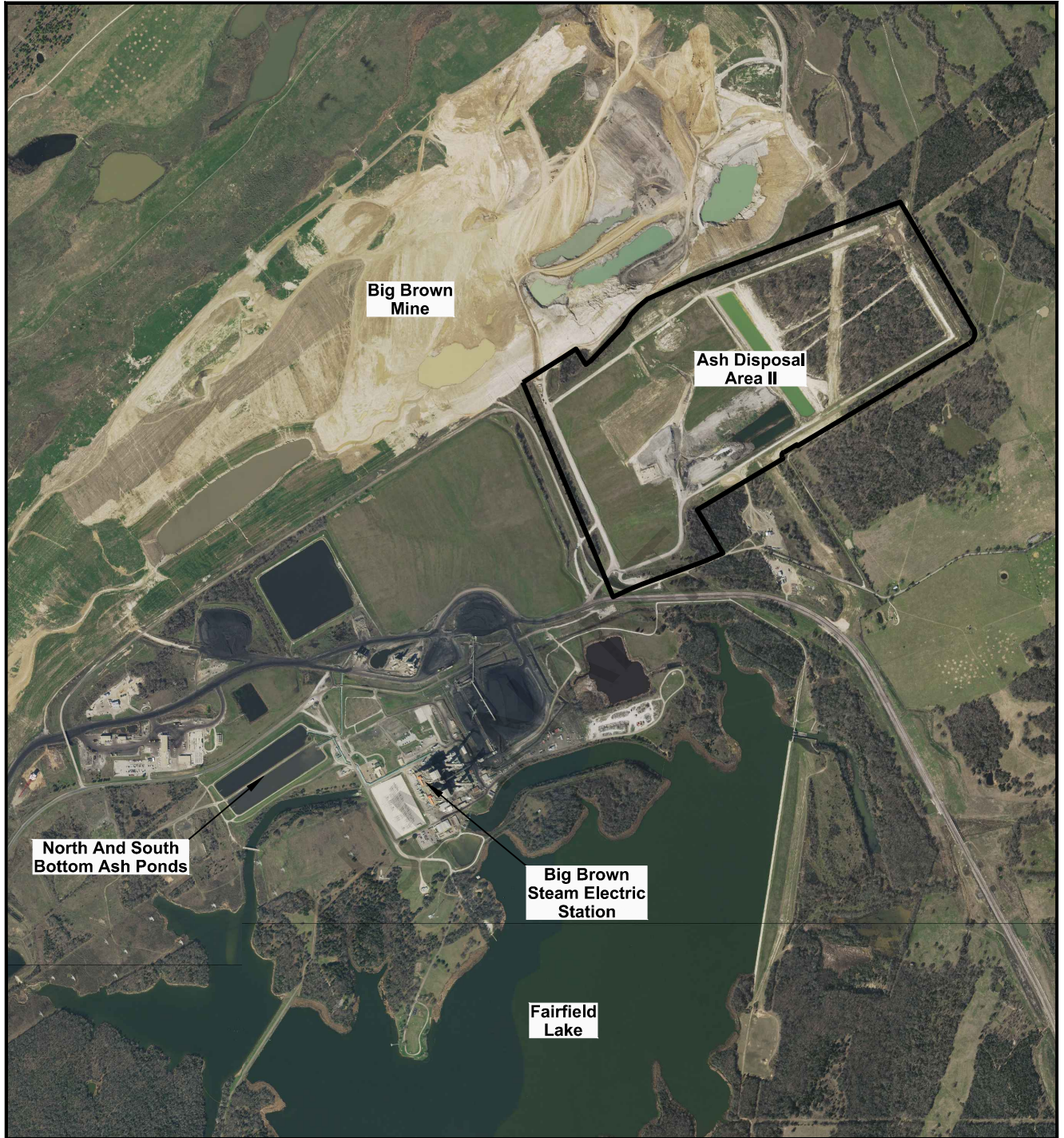
Figure 1

SITE LOCATION MAP

PROJECT: 5196C	BY: ADJ	REVISIONS
DATE: JULY, 2016	CHECKED: RBL/PJB	

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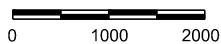
SOURCE:
 Base map from www.tnris.gov, Young, TX 7.5 min. USGS quadrangle dated 1961, revised 1982.



PHOTOGRAPH LOCATION



Scale in Feet



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BIG BROWN STEAM ELECTRIC STATION

Figure 2

SITE VICINITY MAP

PROJECT: 5196C

BY: ADJ

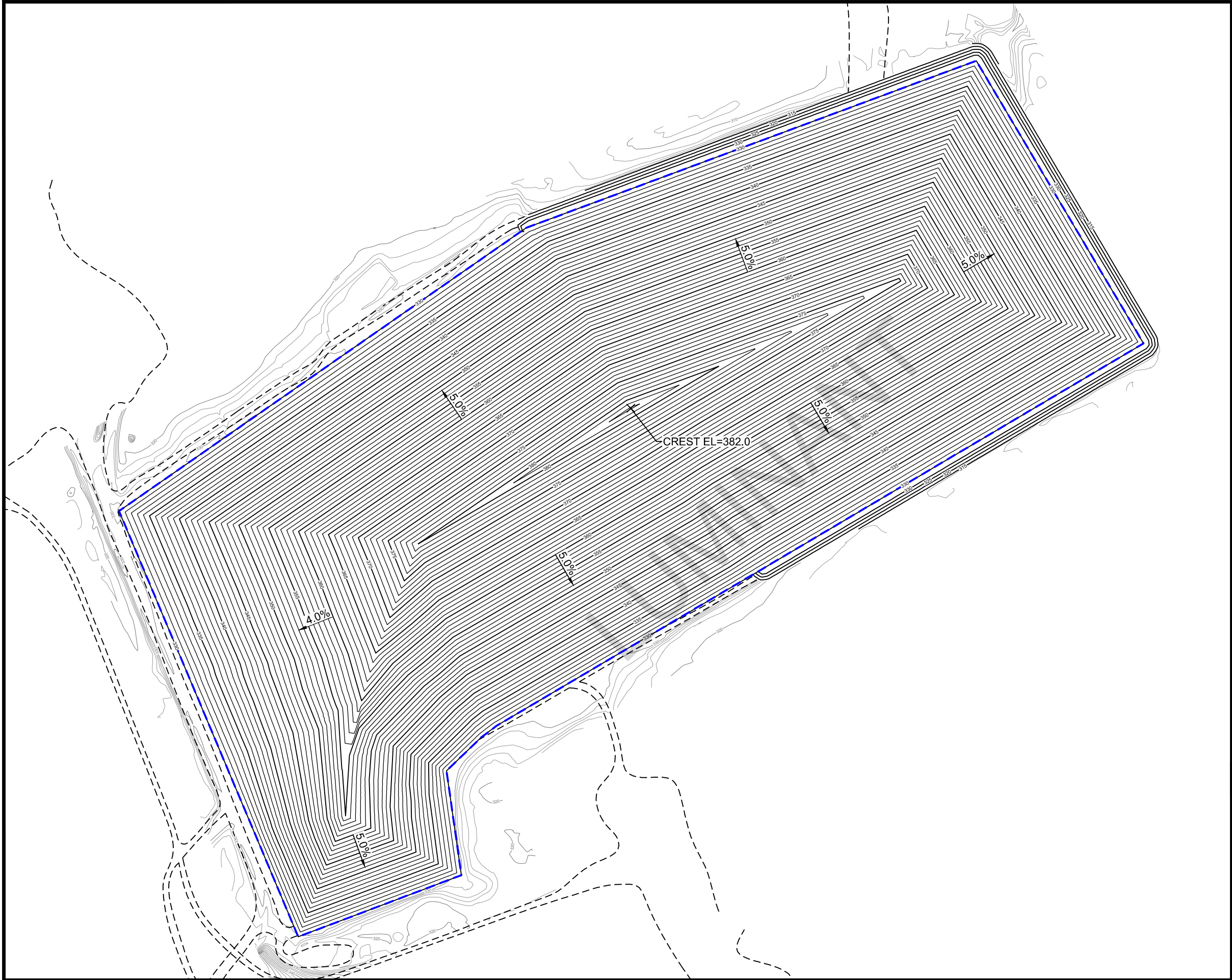
REVISIONS

DATE: OCT., 2016

CHECKED: RBL/PJB

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SOURCE:
 Imagery from www.tnris.gov, Young, aerial photographs, 2015.



EXPLANATION

- Proposed Finished Grade Contour
1 ft Interval
- Proposed Finished Grade Contour
5 ft Interval
- - - Limits of CAP
- - - Gravel Road



Scale in Feet
0 250 500

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Figure 3

PROPOSED GRADING PLAN

PROJECT: 5196C	BY: AJD/GJM	REVISIONS
DATE: OCT., 2016	CHECKED: RBL/PJB	

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