STRUCTURAL INTEGRITY CRITERIA & HYDROLOGIC/HYDRAULIC CAPACITY ASSESSMENT

LABADIE ENERGY CENTER

Labadie Energy Center
226 Labadie Power Plant Road
Labadie, MO 63055

Contents

STRUCTURAL INEGRITY CRITERIA & HYDROLOGIC/ HYDRAULIC CAPACITY ASSESSMENT – LABADIE ENERGY CENTER

I. Introduction

Ameren Missouri has evaluated the Labadie Energy Center's ("Labadie") active surface impoundments in accordance with operating and design criteria requirements set forth below:

§257.71, Liner Design Criteria;
§257.73(c)(1), History of Construction;
§257.73(a)(2), Periodic Hazard Potential Classification;
§257.73(d)(1), Periodic Structural Stability Assessment;
§257.73(e)(1), Periodic Safety Factor Assessment; and
§257.82, Hydrologic and Hydraulic Capacity Requirements

For this periodic assessment, Ameren Missouri retained the engineering firm Reitz & Jens, Inc. to evaluate Labadie's active surface impoundments to determine whether such units conform to good engineering practices[1] with respect to the following criteria: liner design criteria; hazard potential classification; structural stability assessment; safety factor assessment; and hydrologic and hydraulic capacity requirements. Such criteria will be reassessed every five years until such time as the units are closed in accordance with regulatory requirements. Engineering calculations, diagrams, modeling, and work papers supporting this assessment have been placed in the facility's operating record.

II. Background

A. Active Ponds

Labadie is located adjacent to the Missouri River and is surrounded by agricultural fields. At the time of construction, fill material was used to raise the ground surface below power plant buildings out of the floodplain and to a minimum elevation of about 490 feet. The facility has two (2) active surface impoundments LCPA *(Bottom Ash Pond)*; and LCPB *(Fly Ash Pond)*. LCPA and LCPB no longer receive CCRs, have been dewatered and are currently being closed.

LCPA was built in the early 1970s south of the plant as part of the original construction of the Labadie facility. LCPA occupies approximately 164 acres and is surrounded by an earthen embankment which ties into plant fill on the north side of the impoundment. LCPA has been dewatered, no longer receives CCRs and is being closed. Historically, LCPA received process water used to sluice bottom ash, flow from the plant combined drain sump (CDS), and discharge from the LCPB. The impoundment received both bottom and fly ash prior to completion of the LCPB.

LCPB is located immediately east and adjacent to LCPA and occupies approximately 79 acres. A section of the earthen embankment that encircles LCPA, also forms the western side of LCPB. LCPB has been dewatered, no longer receives CCRs and is being closed. Historically, LCPB

[1] Based on engineering codes, widely accepted standards, or a practice widely recommended through the industry. See 40 CFR 25.53, Definitions.

received process water used to sluice fly ash from the plant. LCPB did not receive run-on from areas outside of the perimeter embankment.

The location of the Labadie Energy Center is depicted on Figure 1, United States Geological Services ("USGS") 7.5-minute topographical quadrangle map. Various design and operational features of the CCR units, including water flow path, are set forth on Figure 2.

B. **Embankment Dam**

The north side of the LCPA impoundment is adjacent to plant fill, and the embankment height is generally less than 5 feet. In contrast, on the south and west side of LCPA the maximum levee height is 26.3 feet. The embankment on the east side of the impoundment is shared by both LCPA and LCPB. The embankment dam encircling LCPA is approximately 10,500 feet long and was constructed of compacted fill with upstream slopes of 2 horizontal (H) to 1 vertical (V) and downstream slopes of 3H to 1V. The minimum crown width is approximately 20 feet but increases from 75 to 225 feet along the south and west sides of the impoundment where it accommodates a plant access road. In addition, in 2006 and 2008, additional fly and bottom ash fill material was added along a 2000-foot embankment segment on the south side of LCPA. The fill material was part of a beneficial use project which facilitated the construction of, and access to, a concrete packaging facility.

As part of the construction of LCPB, an embankment was built around three sides of the fly ash pond. Embankment height is greatest on the east and south sides of LCPB where the maximum height is 29.5 feet. The western embankment section separates the LCPB from LCPA. The embankment's upstream slopes are 2H to 1V and 3H to 1V with downstream slopes of 3H to 1V. Earth fill was obtained from the incised portion of the pond, and the lowest elevation at the bottom of the pond is at 460.0 feet. The typical crown width is 20 feet; however, the crown width is 10 feet near the northwest corner of the pond where the embankment height is generally less than 10 feet. Excluding the length of the western embankment section originally constructed for LCPA, the crest length of the dam is approximately 6,100 feet. The interior of LCPB is lined with 60 MIL HDPE on the interior slopes, and 40 MIL HDPE on the pond bottom.

Both LCPA and LCPB are offset at least 2,000 feet from the Missouri River. The Labadie site is surrounded by agricultural fields and no residential homes, businesses or lifeline facilities are located down gradient of the surface impoundments.

III. Structural Integrity Assessment

A. **Liner Design Criteria – 40 CFR §257.71**

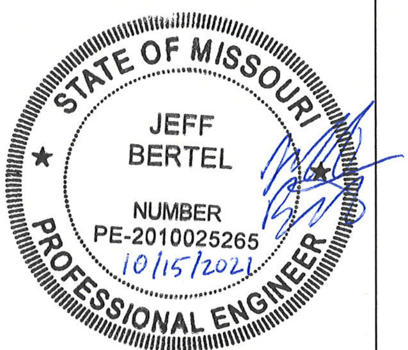
For existing CCR surface impoundments constructed with liner systems, an owner/operator of such units must determine if such liner complies with the specified design and performance standards. At Labadie, only LCPB was constructed with a liner system: 60 MIL HDPE on the interior slopes and 40 MIL HDPE on the bottom. The existing liner system does not satisfy the required design criteria set forth in 40 CFR 257.71 in that it does not have a 2-foot layer of compacted soil with hydraulic conductivity of no more than 1 x 10-7 cm/sec. LCPA and LCPB are therefore considered under the CCR Rule as unlined surface impoundments.

1. Engineering Certification – Liner Design Criteria for Existing CCR Surface Impoundments

The existing CCR surface impoundments LCPA and LCPB at the Labadie Energy Center were evaluated to determine if they were constructed with a liner which meets the requirements of §257.71, Liner Design Criteria for Existing CCR Surface Impoundments. The existing liner systems do not have a 2-foot layer of compacted soil with hydraulic conductivity of no more than 1 x 10-7 cm/sec.

CCR Unit	Existing liner meets requirements of 40 CFR 257.71
LCPA	No
LCPB	No

Engineer's Seal



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B. **Periodic Hazard Potential Classification – 40 CFR §257.73(a)(2)**

Periodically (every five (5) years), an owner or operator of a coal combustion residual ("CCR") unit must update the hazard potential of CCR units and certify the results by a qualified professional engineer. The classification categories are based upon criteria established by the Federal Emergency Management Agency (FEMA) and range as follows: *low hazard potential, significant hazard potential, and high hazard potential.* The FEMA classification system categorizes a dam based on the probability of loss of human life and the impacts on economic, environmental, and lifeline facilities should the dam fail. The specific categories are defined as follows:

> *(1) High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.*
>
> *(2) Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.*
>
> *(3) Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.*

Both LCPA and LCPB at Labadie are classified as having a *low hazard potential* because any structural failure would not be expected to cause a loss of human life.

- **LCPA** – Failure of the LCPA would result in the release of water and CCR into a man-made channel or Labadie Creek to the west, LCPB to the east, and/or the surrounding terrain or plant facilities to the south and north that have not been filled to the level of the pond berms. Should such hypothetical failure occur, it would not be expected to cause loss of life, and economic, environmental, and lifeline losses of the impoundment would generally be limited to the owner.

- **LCPB** - Failure of the LCPB would result in the release of water and CCR into the surrounding terrain to the south or to the east, LCPA to the west, and/or plant facilities to the north. Should such hypothetical failure occur, it would not be expected to cause loss of life, and economic, environmental, and lifeline losses of the impoundment would generally be limited to the owner.

Since none of the active impoundments are classified as *high or significant potential hazards*, an emergency action plan does not need to be prepared. The hazard classification of these units must be re-evaluated every five (5) years.

1. Engineering Certification – Periodic Hazard Potential Classification

The 2020 Periodic Hazard Potential Classification Assessment was conducted for active CCR surface impoundments LCPA and LCPB at the Labadie Energy Center in accordance with the requirements of 40 CFR 257.73(a). These CCR surface impoundments are low hazard potential because failure of the impoundment is not expected to cause a loss of human life, and the economic, environmental and lifeline losses are expected to be low and generally limited to the owner. The hazard potential classification was completed in general accordance with Federal Guidelines for Dam Safety: Hazard Potential Classification for Dams by the Federal Emergency Management Agency (January 2004). The engineering support for this certification has been placed in the operating record.

CCR Unit	Hazard Potential Classification
LCPA	Low
LCPB	Low

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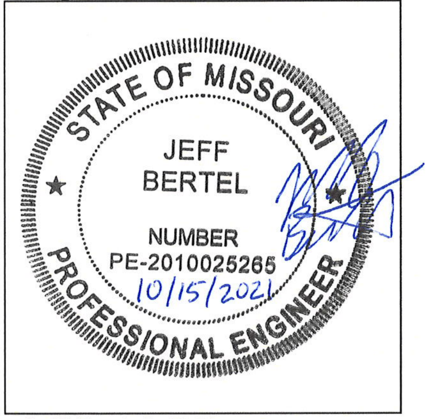

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C. **Periodic Structure Stability Assessment – 40 CFR §257.73(d)**

The owner or operator of a CCR unit must inspect and certify that the design, construction, operation and maintenance of a CCR unit are in accordance with good engineering practices. Such engineering assessment includes the following: stable foundations and abutments; slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown; berm compaction is sufficient to withstand the range of loading conditions, including low pool of an adjacent water body or sudden drawdown; adequately vegetated slopes and surrounding areas; adequate spillway capacity, operation and maintenance; spillways constructed, operated, and maintained to adequately manage the design flow event; and structural integrity and functionality of hydraulic structures underlying the base of CCR unit or passing through the dike.

The downstream slopes for LCPA are vegetated on the south and west sides of the pond. On the north side of the pond the downstream slope is poorly defined given the thick section width, and low embankment height that tapers at a shallow slope angle into the adjacent plant fill. The downstream slope on the north side of the pond is vegetated or consists of bottom ash. The LCPA east embankment downstream slope has been filled during closure of LCPB. The downstream slopes of LCPB are vegetated. The upstream slopes of both LCPA and LCPB have been disturbed by closure construction. The upstream slopes are being capped with an HDPE geomembrane liner overlain by 2 feet of soil that is vegetated as part of their closure.

Vegetative management protocols are set forth in the Operations and Maintenance Procedures and have been implemented to minimize erosion while facilitating the visibility of slopes during inspections.

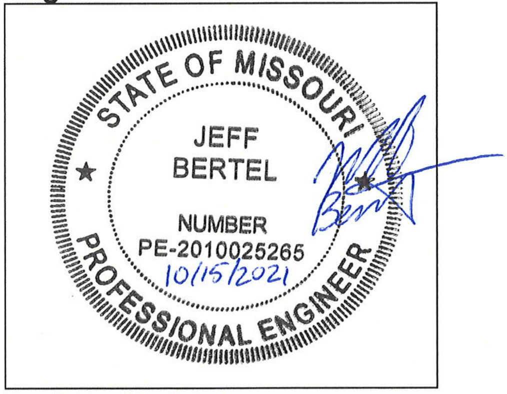
The engineering team visually inspected the interior and exterior embankment slopes of the active surface impoundments and reviewed pertinent geotechnical data. Reitz & Jens visually inspected berm foundations for signs of instability. None were observed. The hydraulic structures could not be inspected because they have been removed or repurposed as part of closure construction. Recommended and ongoing activities include general maintenance (i.e. vegetation maintenance, erosion and rut repair), and reinspection following completion of closure construction to verify disturbed areas have been adequately repaired.

1. Engineering Certification – Periodic Structural Stability Assessment

The 2020 Periodic Structural Stability Assessment was conducted for the active CCR surface impoundments LCPA and LCPB at the Labadie Energy Center. The structural stability assessment was completed in general accordance with 40 CFR Part §257.73(d)(1). Assessment of both CCR Units found no structural stability deficiencies, no significant issues with the current operations and maintenance, and that the design and construction are adequate, however some corrective measures were recommended. The engineering support for this certification has been placed in the operating record.

Requirement	LCPA	LCPB
Periodic assessment was completed in general accordance with the requirements of 40 CFR Part §257.73(d)(1)	Yes	Yes

Engineer's Seal



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D. **Safety Factor Assessment – 40 CFR §257.73(e)**

All active CCR units must have calculated Factors of Safety (FOS) that meet or exceed the following designated values:

Table 1

Loading Conditions	Minimum FOS
Maximum Storage Pool	1.50
Maximum Surcharge Pool	1.40
Seismic	1.00
Liquefaction	1.20

The initial periodic safety factor assessments for LCPA and LCPB were completed in October 2016. The initial assessment found that the calculated factors of safety for the critical cross-sections of each CCR unit exceed the minimum factors of safety for each loading condition required by 40 CFR §257.73(e). LCPA and LCPB no longer receive CCRs, have been dewatered and are currently being closed. The current conditions are no longer representative of those used in the 2016 assessment. A separate safety factor assessment for the closed condition has been performed by Reitz & Jens. This assessment found that the static and seismic stability factors of safety meet or exceed the minimum requirements. The following tables list the factors of safety from the initial periodic safety factor assessment and for the closed condition.

Table 2 – Factors of Safety from the Initial Periodic Safety Factor Assessment

Ponds	Maximum Storage Pool (FOS)	Maximum Surcharge Pool (FOS)	Seismic (FOS)	Liquefaction (FOS)
LCPA	1.81	1.52	1.16	1.30
LCPB	1.64	1.64	1.08	1.27

Table 3 – Factors of Safety for the Closed Condition

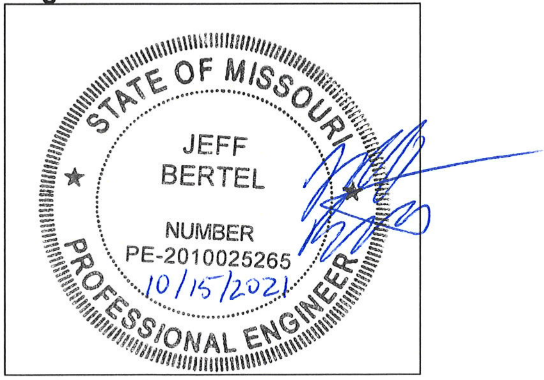
Ponds	Maximum Storage Pool (FOS)	Maximum Surcharge Pool (FOS)	Seismic (FOS)	Liquefaction (FOS)
LCPA	2.69	2.69	1.85	1.69
LCPB	2.18	2.18	1.30	1.56

1. Engineering Certification – Safety Factor Assessment

The 2020 Periodic Safety Factor Assessment was conducted for the active CCR surface impoundments LCPA and LCPB at the Labadie Energy Center. LCPA and LCPB no longer receive CCRs, have been dewatered and are currently being closed. A safety factor assessment for the closed condition of LCPA and LCPB found that the minimum factors of safety meet or exceed the minimum requirements. The Periodic Safety Factor Assessment shows that the critical cross section for these Units meets or exceeds the minimum factors of safety specified in 40 CFR Part §257.73(e)(1) as summarized below. The engineering support for this certification has been placed in the operating record.

Requirement	LCPA	LCPB
The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.	≥1.50	≥1.50
The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.	≥1.40	≥1.40
The calculated seismic factor of safety must equal or exceed 1.00.	≥1.00	≥1.00
The calculated liquefaction factor of safety must equal or exceed 1.20.	≥1.20	≥1.20

Engineer's Seal



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E. **Hydrologic and Hydraulic Capacity Requirements - 40 CFR §257.82**

Flood control system plans must be adequate to manage the inflow from a designated flood event. Such plans must be updated and verified every five (5) years. The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge from the design flood event.

Pertinent data regarding the active surface impoundments is set forth below:

Table 2

CCR Unit	Maximum Surface Area (acres)	Levee Crest Elevation (feet)	Crest Length (feet)	Upstream Slope Steepness (H:V)	Downstream Slope Steepness (H:V)
LCPA	164	492.7	10,500	2:1	3:1
LCPB	79	492.7	6,100	2:1 & 3:1	3:1

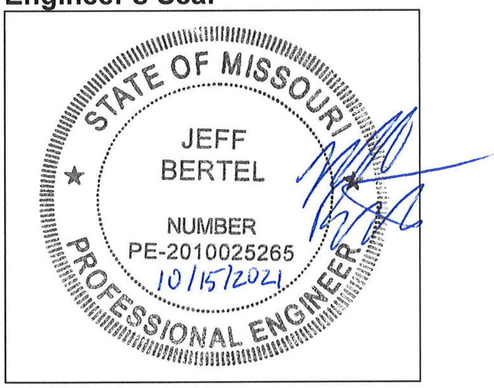
LCPA and LCPB have been dewatered and are currently being closed. Closure of LCPA and LCPB was designed so that water is not permanently impounded within the perimeter embankments. The interior of LCPA and LCPB have been graded and capped to discharge non-contact stormwater at 10 locations around the perimeter embankment. Stormwater is discharged through gravity outlet pipes with stormwater management features to prevent erosion. An inflow design flood control system plan is no longer applicable or necessary for LCPA and LCPB.

1. Engineer's Certification – Hydrologic and Hydraulic Capacity

The initial inflow design flood control system plan was completed in 2016 for LCPA and LCPB in general accordance with 40 CFR Part §257(e)(1) using the 100-year design flood for low hazard potential CCR surface impoundments. LCPA and LCPB have been dewatered and are currently being closed. Closure of LCPA and LCPB was designed so that water is not permanently impounded within the perimeter embankments.

Requirement	LCPA	LCPB
The periodic inflow design flood control system plan meets the requirements of 40 CFR Part §257.82	Yes	Yes

Engineer's Seal



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IV. Construction Summary – *40 CFR 257.73(c)*

The Labadie Energy Center is in Franklin County, Missouri along the Missouri River. The plant is approximately 3 miles north of the Town of Labadie on the right descending bank of the Missouri River at river mile 57.5. The Missouri River has a watershed area of approximately 520,000 square miles at the site. The Labadie Energy Center does not receive stormwater run-on from areas outside the facility.

A. **Owner and Operator**

The CCR Units at the Labadie Energy Center are owned and operated by Ameren Missouri. Labadie Energy Center plant personnel have the primary responsibility of CCR unit operation. The Labadie Energy Center is located at 226 Labadie Power Plant Road in Labadie, Missouri 63055. The Ameren Missouri Dam Safety Group performs CCR unit inspections and reviews all updates to the Operations and Maintenance Manual.

B. **Bottom Ash Pond (LCPA)**

The design plans for the LCPA were issued in 1969 and construction completed shortly after. The LCPA has been dewatered, no longer receives CCRs and is being closed. Previously, LCPA received process water used to sluice bottom ash, flow from the plant combined drain sump (CDS), and discharge from the LCPB. The impoundment received both bottom and fly ash prior to completion of the LCPB. Discharge from the LCPB was near the southeast corner of the impoundment, and the water generally flowed east to west through ditches in the CCR. The estimated average and maximum depth of CCR in the LCPA is approximately 68 and 97 feet, respectively.

The principal spillway has been converted to a stormwater inlet and gravity outfall for non-contact stormwater runoff from a closed section of the pond. The emergency spillway has been removed. Stormwater is routed to 5 stormwater outlets through the perimeter embankment.

a. Foundation and Abutment Geology

The typical soil profile for the LCPA foundation consists of an upper most stratum of stiff to very stiff clay that is 5 feet thick. The clay is intermittently silty, and low to high plastic. The clay is underlain by silt and silty sand with a thickness of 5 to 15 feet. Sand is encountered beneath the silt, and is fine to coarse, and with some silty layers and gravel. Typically, at a depth of about 40 to 50 feet beneath the original ground surface the sands become gravelly sand or sandy gravel. Limestone bedrock exists beneath the alluvium at a depth of 100 to 120 feet.

b. Embankment Material

There are no construction documents or records for the original construction of the LCPA. In the early 1990s, the embankment was raised 8.5 feet using a mixture of bottom and fly ash. Fill placed to raise the embankments was blended and compacted to achieve permeability no greater than $1x10^{-6}$ cm/sec. Based on borings conducted in 2010, the top 9 to 10 feet of the embankment is medium dense to very dense and consists of bottom and fly ash. Beneath the ash fill are 1- to 3-foot-thick layers of clay, silt and sand.

c. LCPA Modifications

1. 1990s Embankment Raise

In the early 1990's, the LCPA embankment was raised 8.5 feet to increase its storage capacity. The new embankment fill consisted of a mixture of bottom and fly ash that was blended and compacted to achieve a hydraulic conductivity of $1x10^{-6}$ cm/sec. The compacted ash was covered with a minimum of 1 foot of earthen cover, except for the access road at the crest of the embankment which is paved with bottom ash. The original spillway was also replaced with the principal spillway in its current configuration. The original spillway consisted of two pumps and discharge piping which ran over the embankment dam and discharged just north of the current outlet works.

2. 2006 and 2008 Beneficial Fill

In 2006 and 2008, additional fill material consisting of bottom and fly ash was placed parallel to the southern embankment section for a new concrete packaging facility. Over approximately 2000 lineal feet, the fill increased the embankment section width 70 to 225 feet. The fill was constructed of compacted bottom and fly ash, consistent with engineering plans and drawings.

3. 2011 Slurry Wall and Anti Seepage Collar Construction

In 2011 Ameren constructed a 500-foot-long slurry wall near the southwest corner of the pond. The wall was constructed to mitigate seepage. The wall was constructed with a maximum hydraulic conductivity of $1x10^{-6}$ cm/sec, through the crest of the embankment and has a width of 2.5 feet. The wall was terminated in fine grain foundation soil, or at a minimum depth of 30 feet. An anti-seepage collar was also installed around the spillway conduit. The seepage collar consisted of a compacted soil and bentonite mixture.

4. 2012 Emergency Spillway

In 2012 an emergency spillway was constructed near the southwest corner of the pond. The emergency spillway is a 75-foot-long broad crested weir with an elevation of 490.0 feet. The spillway was constructed of MoDOT Type 4 riprap on the upstream and downstream slopes, and the crest is constructed of aggregate sufficient to withstand design flows. The spillway was subsequently removed during closure construction.

5. 2013 Slurry Wall

Seepage was identified below the emergency spillway that was constructed in 2012. To cut-off the seepage, a soil-bentonite slurry wall was constructed through the crest of the embankment and extended from the 2011 slurry wall approximately 600 feet east.

6. 2015 Seepage Collar and Valve Replacement

In 2015 a concrete collar was constructed around the outfall pipe to help reduce seepage. At the same time, the area surrounding the downstream outlet works was graded to drain and armored with riprap. One butterfly valve was also replaced in 2015.

7. West Detention Basin

The West Detention Basin was constructed over an approximate 8-acre area on the north side of the LCPA. The area was filled and graded to form the basin. The area was then capped with HDPE geomembrane inside the basin, and HDPE geomembrane and closure turf outside the basin. The West Detention Basin is used for plant stormwater management and water quality treatment.

8. Closure Construction (2019 to 2021)

Closure of LCPA was initiated in 2019 and is planned to be complete in 2021. Closure includes grading the remaining exposed CCR to facilitate drainage and capping the CCR with HDPE geomembrane overlain by 2 feet of soil. The principal spillway has been converted to a stormwater inlet and gravity outfall for non-contact stormwater runoff from a closed section of the pond. The emergency spillway has been removed. Stormwater is routed to 5 stormwater outlets through the perimeter embankment.

C. **Fly Ash Pond (LCPB)**

The LCPB was built in the 1990's. The LCPB has been dewatered, no longer receives CCRs and is being closed. Historically, the LCPB received process water used to sluice fly ash. The LCPB did not receive run-on from areas outside of the perimeter embankment. The LCPB outlet works were removed during closure construction. The estimated average and maximum depth of CCR in the fly ash system is approximately 31 and 41 feet, respectively.

a. Foundation and Abutment Geology

The typical soil profile for the LCPB foundation consists of a thin upper most stratum of firm to stiff clay that is 2 to 5 feet thick. The foundation soil then becomes clayey or sandy silt and loose to medium-dense. The thickness of the silty soil is typically 4 to 10 feet. Underlying the silt is poorly graded, fine to coarse sand which is medium dense to dense. Typically, at a depth of about 40 to 50 feet beneath the original ground surface the sands become gravelly sand or sandy gravel. Limestone bedrock exists beneath the alluvium at a depth of 100 to 120 feet.

b. Embankment Material

The embankment was constructed of earth fill borrowed from the interior of the pond. The design plans note that the top 6 feet of the foundation soil inside the perimeter berm should be used as embankment fill. Geotechnical investigations show the embankment fill is heterogeneous and consists of sand, silt and clay that were generally placed in 8- to 12-inch-thick lifts.

c. LCPB Modifications

1. 2012 Emergency Spillway

In 2012 an emergency spillway was constructed near the southwest corner of the pond. The emergency spillway is a 50-foot-long broad crested weir with an elevation of 491.7 feet. The spillway was constructed of MoDOT Type 4 riprap on the upstream and downstream slopes, and the crest is constructed of aggregate sufficient to withstand design flows. The spillway was subsequently removed during closure construction.

2. Haul Road (2016 - 2017)

Construction of a haul road on the crest of the north embankment is began in late 2016 and was completed in 2017. The construction lowered the crest of the embankment to el. 491, and the HDPE liner to el. 490. The haul road was paved with 12 inches of non-reinforced concrete that is underlain by 12 inches of compacted MoDOT Type 1 Aggregate Base Course.

3. Closure Construction (2019 – 2021)

Closure of LCPB was initiated in 2019 and is planned to be complete in 2021. Closure includes grading the remaining exposed CCR to facilitate drainage and capping the CCR with HDPE geomembrane overlain by 2 feet of soil. Stormwater is routed to 5 stormwater outlets through the perimeter embankment.

D. **Surveillance, Maintenance and Repair of the CCR Units**

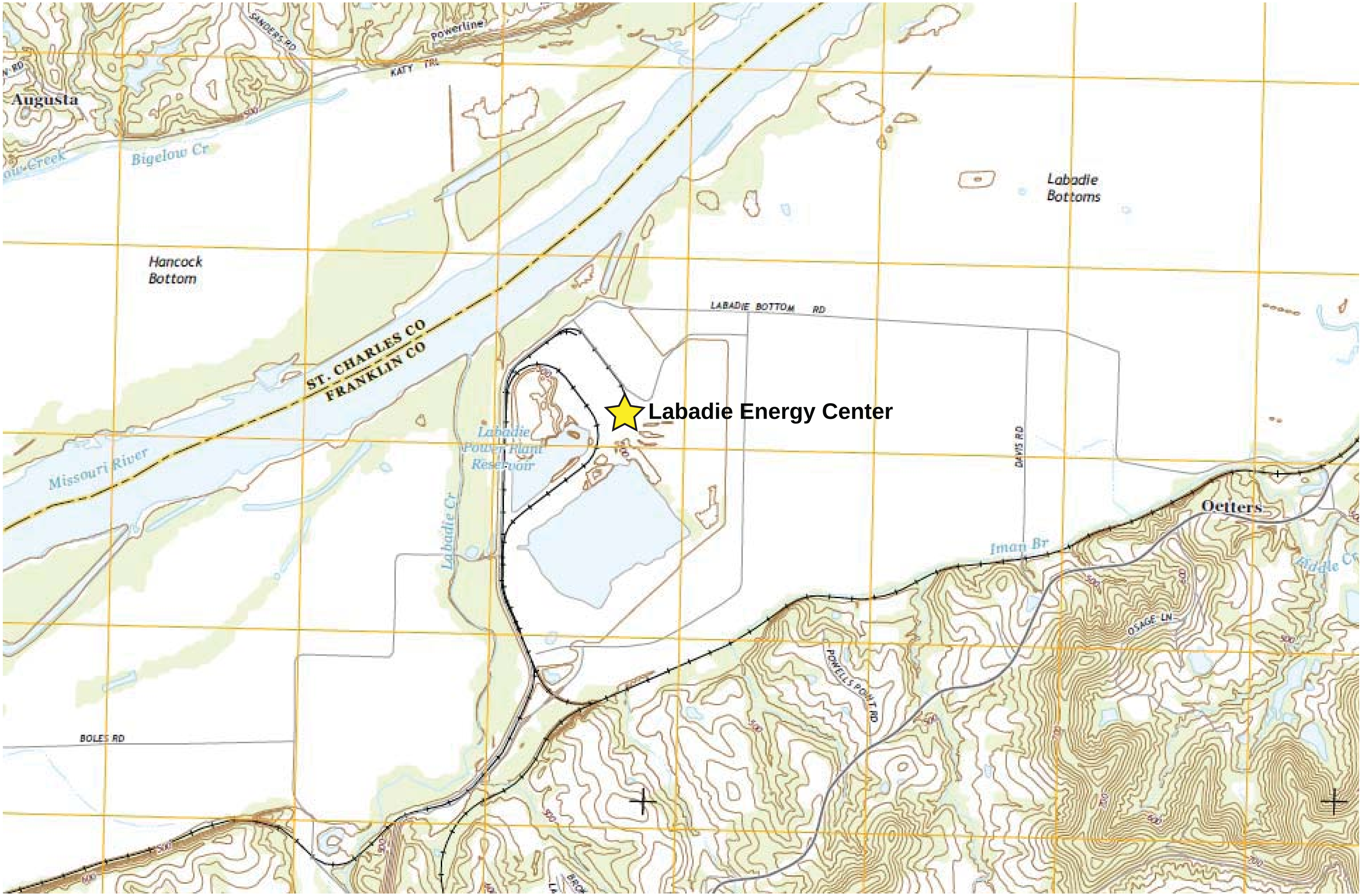
The Operations and Maintenance Manual outlines objectives, responsibilities, and procedures for Ameren personnel who are responsible for the management of the CCR units. The embankments of the CCR units are visually inspected weekly by Ameren plant operations staff. Ameren Missouri Dam Safety Group personnel perform annual inspections and periodic inspections[1] or assessments with plant operations staff. In addition, the Ameren Missouri Dam Safety Group may conduct unannounced safety inspections.

The Operations and Maintenance Manual requires that timely repairs must be made after problem areas are identified. The plant engineer is to specify the work to be completed using Ameren's Work Control Process and provide direction to correct items noted in the operation and maintenance, and engineering inspections. The work request by the plant engineer will be reviewed with the Dam Safety Group to ensure proper emphasis has been placed on the request. The Operations and Maintenance Manual specifies the minimum maintenance activities and requires that maintenance activities be documented. The Operations and Maintenance Manual further specifies that no alterations or repairs to structural elements should be made without the approval of the Chief Dam Safety Engineer and the concurrence of the MDNR Water Resources Center.

E. **Instrumentation**

LCPA and LCPB have been dewatered and are currently being closed. Currently there are no instruments monitored to check impoundment operation.

[2] The annual and periodic inspection reports contain the following information: depth of impounded water; storage capacity; modifications from last inspection, if any, CCR depth; volume of impounded water and CCR; changes to the downstream watershed, if any.



Ameren Missouri
Labadie Energy Center
CCR Unit Evaluation
USGS 7.5 minute quadrangle map

REITZ & JENS, INC.

Figure 1

Legend:

- Pond Footprint
- Primary Flow Path
- Emergency Spillway Flow Path

CCR UNIT	MAXIMUM SURFACE ELEVATION (ACRES)	DAM CREST ELEVATION (FEET)	CREST LENGTH (FEET)	NORMAL POOL ELEVATION (FEET)	MAXIMUM SURCHARGE POOL (FEET)	UPSTREAM SLOPE STEEPNESS (H:V)	DOWNSTREAM SLOPE STEEPNESS (H:V)
LCPA	164.0	492.7	10500	486.0	489.0	2H:1V	3H:1V
LCPB	79.0	492.7	6100	480.0	492.0	2H:1V & 3H:1V	3H:1V

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CCR Unit Evaluation

Figure 2 - Operational Data