

Annual CCR Impoundment PE Inspection

Lined Ash Pond
New Madrid Power Plant
New Madrid, MO

Associated Electric Cooperative, Inc.

Inspection

Visual Inspection

On July 17, 2019, a visual inspection of the inspection of the impoundment was completed to identify signs of distress or malfunction. The following subsections and enclosed inspection report describe the conditions observed during the inspection.

Changes in Geometry

Since the last inspection, fill has been placed in the impoundment to raise the elevation up to minimum grades required for closure as required by the engineered closure design.

Volumes

The Lined Pond has an estimated surface area of approximately 78 acres and a storage volume of approximately 2.7 million cubic yards.

Inspection for Structural Weaknesses

The Lined Pond was visually inspected for any appearances of an actual or potential structural weakness of the CCR unit. The visual inspection did not indicate any deficiencies. Details of this inspection can be found in the enclosed inspection checklist.

Changes Since Previous Inspection

Since the last inspection, fill has been placed in the impoundment to raise the elevation up to minimum grades required for closure.

Certification

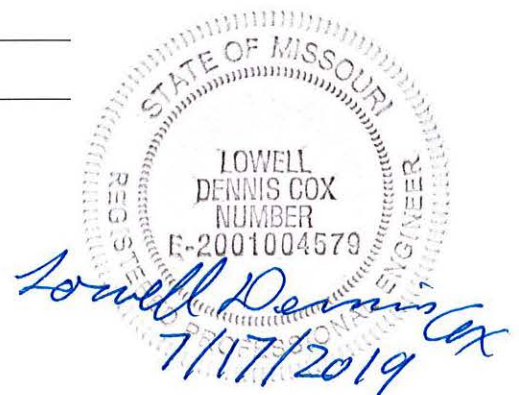
The assessment of the general condition of the surface impoundment is based upon available data and visual observation as required by 40 CFR 257.83 (b) – Inspection Requirements for CCR Surface Impoundments. In reviewing this report, it should be realized that the described condition of the surface impoundment is based on observations of field conditions at the time of inspection. Conditions of surface impoundments depend on numerous internal and external conditions, therefore it should be noted that the estimates and observations only represent the conditions at the time of inspection.

Signed: Lowell Dennis Cox

Print Name: Lowell Dennis Cox

Missouri License Number: E-2001004579

Date: 7/17/2019



Dam/Impoundment Evaluation Summary Detail Sheet

1. NID ID: N/A		4. Inspection Date: July 17, 2019	
2. Dam Name: Lined Ash Pond		5. Last Insp. Date: February 6, 2018	
3. Dam Location: 41 St. Jude Park, Marston, MO		6. Next Inspection:	
7. Inspector: Dennis Cox, P. E.			
8. Consultant: N/A			
9. Hazard Code:	9a. Is Hazard Code Change Requested?:	No	
10. Insp. Frequency: #N/A	11. Overall Physical Condition of Dam:	Good	
12. Spillway Capacity (% SDF)			
E1. Design Methodology:	4	E7. Low-Level Discharge Capacity:	4
E2. Level of Maintenance:	4	E8. Low-Level Outlet Physical Condition:	4
E3. Emergency Action Plan:	5	E9. Spillway Design Flood Capacity:	5
E4. Embankment Seepage:	5	E10. Overall Physical Condition of the Dam:	5
E5. Embankment Condition:	5	E11. Estimated Repair Cost:	N/A
E6. Concrete Condition:	5		

Evaluation Description

E1: DESIGN METHODOLOGY

1. Unknown Design – no design records available
2. No design or post-design analyses
3. No analyses, but dam features appear suitable
4. Design or post design analysis show dam meets most criteria
5. State of the art design – design records available & dam meets all criteria

E2: LEVEL OF MAINTENANCE

1. Dam in disrepair, no evidence of maintenance, no O&M manual
2. Dam in poor level of upkeep, very little maintenance, no O&M manual
3. Dam in fair level of upkeep, some maintenance and standard procedures
4. Adequate level of maintenance and standard procedures
5. Dam well maintained, detailed maintenance plan that is executed

E3: EMERGENCY ACTION PLAN

1. No plan or idea of what to do in the event of an emergency
2. Some idea but no written plan
3. No formal plan but well thought out
4. Available written plan that needs updating
5. Detailed, updated written plan available, annual training

E4: SEEPAGE (Embankments, Foundations, & Abutments)

1. Severe piping and/or seepage with no monitoring
2. Evidence of monitored piping and seepage
3. No piping but uncontrolled seepage
4. Minor seepage or high volumes of seepage with filtered collection
5. No seepage or minor seepage with filtered collection

E5: EMBANKMENT CONDITION

1. Severe erosion and/or large trees
2. Significant erosion or significant woody vegetation
3. Brush and exposed embankment soils, or moderate erosion
4. Unmaintained grass, rodent activity and maintainable erosion
5. Well maintained healthy uniform grass cover

E6: CONCRETE CONDITION

1. Major cracks, misalignment, discontinuities causing leaks, seepage or stability concerns
2. Cracks with misalignment inclusive of transverse cracks with no misalignment but with potential for significant structural degradation
3. Significant longitudinal cracking and minor transverse cracking
4. Spalling and minor surface cracking
5. No apparent deficiencies

E7: LOW-LEVEL OUTLET DISCHARGE CAPACITY

1. No low level outlet, no provisions (e.g. pumps, siphons) for emptying pond
2. No operable outlet, plans for emptying pond, but no equipment
3. Outlet with insufficient drawdown capacity, pumping equipment available
4. Operable gate with sufficient drawdown capacity
5. Operable gate with capacity greater than necessary

E8: LOW-LEVEL OUTLET PHYSICAL CONDITION

1. Outlet inoperative needs replacement, non-existent or inaccessible
2. Outlet inoperative needs repair
3. Outlet operable but needs repair
4. Outlet operable but needs maintenance
5. Outlet and operator operable and well maintained

E9: SPILLWAY DESIGN FLOOD CAPACITY

1. 0 - 50% of the SDF or unknown
2. 50-90% of the SDF
3. 90 - 100% of the SDF
4. >100% of the SDF with actions required by caretaker (e.g. open outlet)
5. >100% of the SDF with no actions required by caretaker

E10: OVERALL PHYSICAL CONDITION OF DAM

1. UNSAFE – Major structural, operational, and maintenance deficiencies exist under normal operating conditions
2. POOR - Significant structural, operation and maintenance deficiencies are clearly recognized under normal loading conditions
3. FAIR - Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual loading conditions that may realistically occur. Can be used when uncertainties exist as to critical parameters
4. SATISFACTORY - Minor operational and maintenance deficiencies. Infrequent hydrologic events would probably result in deficiencies.
5. GOOD - No existing or potential deficiencies recognized. Safe performance is expected under all loading including SDF

E11: ESTIMATED REPAIR COST

- Estimation of the total cost to address all identified structural, operational, maintenance deficiencies. Cost shall be developed utilizing standard estimating guides and procedures

Changes/Deviations to Database Information since Last Inspection

DAM SAFETY INSPECTION CHECKLIST

NAME OF DAM: <u>Lined Ash Pond</u>	STATE ID #: <u>MO-0001171</u>
REGISTERED: (YES/NO) <u>No</u>	NID ID #: <u>N/A</u>
STATE SIZE CLASSIFICATION: <u>N/A</u>	STATE HAZARD CLASSIFICATION: <u>TBD</u>
	CHANGE IN HAZARD CLASSIFICATION REQUESTED?: (YES/NO) <u>No</u>
<i><u>DAM LOCATION INFORMATION</u></i>	
CITY/TOWN: <u>New Madrid</u>	COUNTY/STATE: <u>New Madrid/Missouri</u>
DAM LOCATION: <u>41 St. Jude Park, Marston, MO</u> (street address if known)	ALTERNATE DAM NAME: <u>N/A</u>
USGS QUAD.: <u>New Madrid, MO-KY</u>	LAT.: <u>36° 30.4' N</u> LONG.: <u>89° 33.5' W</u>
DRAINAGE BASIN: <u>N/A</u>	RIVER: <u>Mississippi River</u>
IMPOUNDMENT NAME(S): <u>Lined Ash Pond</u>	
<i><u>GENERAL DAM INFORMATION</u></i>	
TYPE OF DAM: <u>Earth Incised and Bermed</u>	OVERALL LENGTH (FT): <u>7,500</u>
PURPOSE OF DAM: <u>Sedimentation and Storage Basin</u>	NORMAL POOL STORAGE (ACRE-FT): <u>125</u>
YEAR BUILT: <u>1994</u>	MAXIMUM POOL STORAGE (ACRE-FT): <u>1875</u>
STRUCTURAL HEIGHT (FT): <u>25</u>	EL. NORMAL POOL (FT): <u>293.0</u>
HYDRAULIC HEIGHT (FT): <u>3</u>	EL. MAXIMUM POOL (FT): <u>307.0 (minimum crest elevation)</u>
RESERVOIR SURFACE AREA (ACRES): <u>75</u>	WINTER DRAWDOWN (FT BELOW NORMAL POOL) <u>0.0</u>
PUBLIC ROAD ON CREST: <u>No</u>	DRAWDOWN VOL. (AC-FT) <u>0.0</u>
PUBLIC BRIDGE OVER SPILLWAY: <u>No</u>	

NAME OF DAM: Lined Ash Pond STATE ID #: MO-0001171

INSPECTION DATE: July 17th, 2019 NID ID #: _____

INSPECTION SUMMARY

DATE OF INSPECTION: July 17th, 2019 DATE OF PREVIOUS INSPECTION: February 6, 2018

TEMPERATURE/WEATHER: Sunny, 88 degrees ARMY CORPS PHASE I: (YES/NO) If YES, date _____

CONSULTANT: N/A PREVIOUS ALT. PHASE I: (YES/NO) If YES, date _____

BENCHMARK/DATUM: NAVD88

OVERALL PHYSICAL CONDITION OF DAM: Good DATE OF LAST REHABILITATION: N/A

SPILLWAY CAPACITY: N/A

EL. POOL DURING INSP.: Below 288 EL. TAILWATER DURING INSP.: 288

PERSONS PRESENT AT INSPECTION

<u>NAME</u>	<u>TITLE/POSITION</u>	<u>REPRESENTING</u>
<u>Dennis Cox</u>	<u>Senior Plant Engineer</u>	<u>AECI</u>
<u>David Palmeri</u>	<u>Engineering Intern</u>	<u>AECI</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

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INSPECTION DATE: <u>July 17, 2019</u>		NID ID #: <u>N/A</u>	
OWNER: ORGANIZATION	<u>Associated Electric Cooperative, I</u>	CARETAKER: ORGANIZATION	<u>Associated Electric Cooperative, Inc.</u>
NAME/TITLE	<u>Mr. Dennis Cox</u>	NAME/TITLE	<u>Mr. Dennis Cox</u>
STREET	<u>P.O. Box 156</u>	STREET	<u>P.O. Box 156</u>
TOWN, STATE, ZIP	<u>New Madrid, MO 63869</u>	TOWN, STATE, ZIP	<u>New Madrid, MO 63869</u>
PHONE	<u></u>	PHONE	<u></u>
EMERGENCY PH. #	<u></u>	EMERGENCY PH. #	<u></u>
FAX	<u></u>	FAX	<u></u>
EMAIL	<u></u>	EMAIL	<u></u>
OWNER TYPE	<u></u>		
PRIMARY SPILLWAY TYPE <u>Mechanical Pump w/ Conduit as Secondary</u>			
SPILLWAY LENGTH (FT)	<u>N/A</u>	SPILLWAY CAPACITY (CFS)	<u>N/A</u>
AUXILIARY SPILLWAY TYPE	<u>N/A</u>	AUX. SPILLWAY CAPACITY (CFS)	<u>N/A</u>
NUMBER OF OUTLETS	<u>One</u>	OUTLET(S) CAPACITY (CFS)	<u>Unknown</u>
TYPE OF OUTLETS	<u>One Decant</u>	TOTAL DISCHARGE CAPACITY (CFS)	<u>Unknown</u>
DRAINAGE AREA (SQ MI)	<u>0.15</u>	SPILLWAY DESIGN FLOOD (PERIOD/CFS)	<u>Unknown</u>
HAS DAM BEEN BREACHED OR OVERTOPPED? (YES/NO):	<u>No</u>	IF YES, PROVIDE DATE(S)	<u></u>
FISH LADDER (LIST TYPE IF PRESENT)	<u>Unknown</u>		
DOES CREST SUPPORT PUBLIC ROAD? (YES/NO)	<u>No</u>	IF YES, ROAD NAME:	<u></u>
PUBLIC BRIDGE WITHIN 50' OF DAM? (YES/NO):	<u>No</u>	IF YES, ROAD/BRIDGE NAME:	<u></u>
		MHD BRIDGE NO. (IF APPLICABLE)	<u></u>

NAME OF DAM: Lined Ash Pond

STATE ID #: MO-0001171

INSPECTION DATE: July 17th, 2019

NID ID #: N/A

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	Gravel access road, western crest surface is levee's non-gravel surface.	X		
	2. SURFACE CRACKING	None observed	X		
	3. SINKHOLES, ANIMAL BURROWS	None observed	X		
	4. VERTICAL ALIGNMENT (DEPRESSIONS)	None observed	X		
	5. HORIZONTAL ALIGNMENT	None observed	X		
	6. RUTS AND/OR PUDDLES	Minor rutting and erosion on southern crest road.	X		
	7. VEGETATION (PRESENCE/CONDITION)	Sares vegetation taller than 6 inches.	X		
	8. ABUTMENT CONTACT	Abutments in good condition.	X		

ADDITIONAL COMMENTS: minor rutting and minor erosion at some places on southern crest. Sparse vegetation taller than 6 inches on the d/s side of western embankment crest and the d/s and u/s side of eastern embankment crest.

NAME OF DAM: Lined Ash Pond

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INSPECTION DATE: July 17, 2019

NID ID #: N/A

EMBANKMENT (D/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S SLOPE	1. WET AREAS (NO FLOW)	None observed	X		
	2. SEEPAGE	None observed	X		
	3. SLIDE, SLOUGH, SCARP	None observed	X		
	4. EMB.-ABUTMENT CONTACT	In good condition			
	5. SINKHOLE/ANIMAL BURROWS	None observed	X		
	6. EROSION	None observed	X		
	7. UNUSUAL MOVEMENT	None observed	X		
	8. VEGETATION (PRESENCE/CONDITION)	Grass slopes	X		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Lined Ash Pond

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INSPECTION DATE: July 17, 2019

NID ID #: N/A

EMBANKMENT (U/S SLOPE)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
U/S SLOPE	1. SLIDE, SLOUGH, SCARP	None observed	X		
	2. SLOPE PROTECTION TYPE AND COND.	U/S slopes are covered with liner, however there are areas where liner is not covered.		X	
	3. SINKHOLE/ANIMAL BURROWS	None observed	X		
	4. EMB.-ABUTMENT CONTACT	None observed	X		
	5. EROSION	None observed	X		
	6. UNUSUAL MOVEMENT	None observed	X		
	7. VEGETATION (PRESENCE/CONDITION)	None observed	X		

ADDITIONAL COMMENTS: Liner exposed/unprotected along portions of eastern and southern embankments. It is understood that soil can not be placed on exposed area of liner on slope due to smooth liner surface on 3H:1V. This issue should be corrected when pond is closed and covered.

NAME OF DAM: Lined Ash Pond

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NID ID #: N/A

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	P6 thru P8, MW8, MW9 - Good Condition	X		
	2. OBSERVATION WELLS	None present	X		
	3. STAFF GAGE AND RECORDER	None present	X		
	4. WEIRS	None present	X		
	5. INCLINOMETERS	None present	X		
	6. SURVEY MONUMENTS	None present	X		
	7. DRAINS	None present	X		
	8. FREQUENCY OF READINGS	No measurements are taken	X		
	9. LOCATION OF READINGS	N/A	X		

ADDITIONAL COMMENTS: _____

NAME OF DAM: Lined Ash Pond

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INSPECTION DATE: July 17th, 2019

NID ID #: N/A

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
D/S AREA	1. ABUTMENT LEAKAGE	None Present	X		
	2. FOUNDATION SEEPAGE	None Present	X		
	3. SLIDE, SLOUGH, SCARP	None Present	X		
	4. WEIRS	None Present	X		
	5. DRAINAGE SYSTEM	None Present	X		
	6. INSTRUMENTATION	None Present	X		
	7. VEGETATION	Grass less than 6"	X		
	8. ACCESSIBILITY	Gravel access road along crest. Full time security and fence	X		
9. DOWNSTREAM HAZARD DESCRIPTION					
10. DATE OF LAST EAP UPDATE					

ADDITIONAL COMMENTS: _____

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NID ID #: N/A

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Mechanical Pumps	X		
	WEIR TYPE	None Present	X		
	SPILLWAY CONDITION	Fair	X		
	TRAINING WALLS	None present	X		
	SPILLWAY CONTROLS AND CONDITION	None present	X		
	UNUSUAL MOVEMENT	None present	X		
	APPROACH AREA	Fair	X		
	DISCHARGE AREA	Fair	X		
	DEBRIS	None present	X		
	WATER LEVEL AT TIME OF INSPECTION	Below 288	X		

ADDITIONAL COMMENTS: _____

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OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
OUTLET WORKS	TYPE	N/A	X		
	INTAKE STRUCTURE	N/A	X		
	TRASHRACK	N/A	X		
	PRIMARY CLOSURE	N/A	X		
	SECONDARY CLOSURE	N/A	X		
	CONDUIT	N/A	X		
	OUTLET STRUCTURE/HEADWALL	Fair	X		
	EROSION ALONG TOE OF DAM	None	X		
	SEEPAGE/LEAKAGE	None	X		
	DEBRIS/BLOCKAGE	None	X		
	UNUSUAL MOVEMENT	None	X		
	DOWNSTREAM AREA	Regularly mowed.	X		
	MISCELLANEOUS				

ADDITIONAL COMMENTS: _____

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NID ID #: N/A

UNDERLYING HYDRAULIC STRUCTURES/PIPES

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
UNDERLYING HYDRAULIC STRUCTURES /PIPES	TYPE	Two 18" pipes through embankment	X		
	INLET	Inlet on u/s slope not visible (under water level)	X		
	CONDUIT	Outfall on d/s side partially visible - in good condition	X		
	OUTLET STRUCTURE/HEADWALL	Fair	X		
	EROSION ALONG STRUCTURE	None present	X		
	SEEPAGE/LEAKAGE	None present	X		
	DEBRIS/BLOCKAGE	None present	X		
	UNUSUAL MOVEMENT	None present	X		
	DOWNSTREAM AREA	Raw water pond.	X		
MISCELLANEOUS					

ADDITIONAL COMMENTS: _____

Note: Use additional sheets for additional outlets.