Annual CCR Surface Impoundment PE Inspection

Pond 003

New Madrid Power Plant

New Madrid, MO

Associated Electric Cooperative, Inc.

Inspection

Visual Inspection

On January 11, 2017, a visual inspection of the surface impoundment was completed. The visual inspection included both a visual inspection of the CCR impoundment to identify signs of distress or malfunction and a visual inspection of the hydraulic structures for structural integrity. The following subsections and enclosed inspection report describe the conditions observed during the inspection.

Changes in Geometry

There have been no changes to the geometry of the impounding structure since the previous annual inspection.

Instrumentation Readings

Piezometers/monitoring wells are located along the crest of the dikes of Pond 003. The piezometers/groundwater monitoring wells were more recently installed for purposes of monitoring groundwater and are not monitored for structural stability purposes. No readings were taken. No other instrumentation was identified as part of the inspection.

Impounded Water Depth

On the inspection date, the pond water elevation was recorded at 302 ft. The concrete stop logs in the decant structure have been set at an approximate elevation of 302 ft and have not been adjusted. This is equivalent to a depth of approximately 17 feet.

Storage Capacity

The remaining storage capacity of the impoundment was approximated to be 167 acre-ft. As part of normal operation, ash collected in the pond is periodically disposed of in the Utility Waste Landfill and a very minimal amount of ash accumulates in the pond.

Volumes

The impounded water is approximated to be 48 acre-ft. The impounded CCR volume was approximated to be 1768 acre-ft. As part of normal operation, ash collected in the pond is periodically disposed of in the Utility Waste Landfill and a very minimal amount of ash accumulates in the pond.

Inspection for Structural Weaknesses

The impoundment 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.

Certification

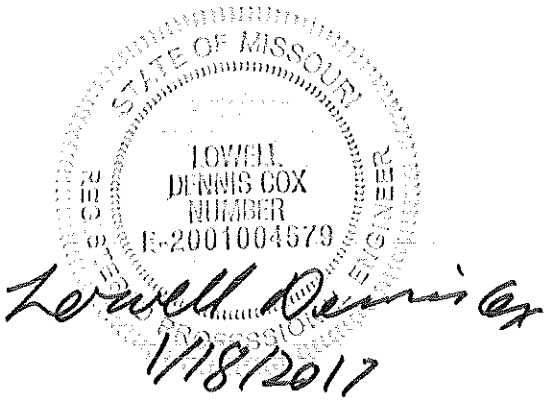
The assessment of the general condition of the surface impoundment is based upon available data and visual observation as required by 40 CFR 257.83 (b) – Inspection Requirements for CCR Surface Impoundments. In reviewing this report, it should be realized that the described condition of the surface impoundment 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: 1/18/2017



Dam/Impoundment Evaluation Summary Detail Sheet

1. NID ID:	N/A	4. Inspection Date:	
2. Dam Name:	Pond 003	5. Last Insp. Date:	September 1, 2015
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?:	
10. Insp. Frequency:	#N/A	11. Overall Physical Condition of Dam:	
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:	3	E9. Spillway Design Flood Capacity:	
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 and filed with MADCR, 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:	Pond 003	STATE ID #:	MO-0001171
REGISTERED: (YES/NO)	No	NID ID #:	N/A
STATE SIZE CLASSIFICATION:	N/A	STATE HAZARD CLASSIFICATION:	TBD
		CHANGE IN HAZARD CLASSIFICATION REQUESTED?: (YES/NO)	No

DAM LOCATION INFORMATION

CITY/TOWN:	New Madrid	COUNTY/STATE:	*New Madrid/Missouri*
DAM LOCATION: (street address if known)	41 St. Jude Park, Marston, MO	ALTERNATE DAM NAME:	N/A
USGS QUAD.:	New Madrid, MO-KY	LAT.:	36° 30.4' N
		LONG.:	89° 33.5' W
DRAINAGE BASIN:	N/A	RIVER:	Mississippi River
IMPOUNDMENT NAME(S):	Unlined Ash Pond (003 Pond)		

GENERAL DAM INFORMATION

TYPE OF DAM:	Earthen Incised and Bermed	OVERALL LENGTH (FT):	9300
PURPOSE OF DAM:	Sedimentation and Storage Basin	NORMAL POOL STORAGE (ACRE-FT):	
YEAR BUILT:	1972	MAXIMUM POOL STORAGE (ACRE-FT):	1707
STRUCTURAL HEIGHT (FT):	20	EL. NORMAL POOL (FT):	302.0
HYDRAULIC HEIGHT (FT):	8	EL. MAXIMUM POOL (FT):	307.0 (minimum crest elevation)
RESERVOIR SURFACE AREA (ACRES):	110	WINTER DRAWDOWN (FT BELOW NORMAL POOL)	0.0
PUBLIC ROAD ON CREST:	No	DRAWDOWN VOL. (AC-FT)	0.0
PUBLIC BRIDGE OVER SPILLWA'	No		

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 NID ID #: N/A

INSPECTION SUMMARY

DATE OF INSPECTION: January 11, 2017 DATE OF PREVIOUS INSPECTION: September 1, 2015

TEMPERATURE/WEATHER: Cloudy, 65 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: DATE OF LAST REHABILITATION: N/A

SPILLWAY CAPACITY:

EL. POOL DURING INSP.: 305 EL. TAILWATER DURING INSP.: 305

PERSONS PRESENT AT INSPECTION

NAME	TITLE/POSITION	REPRESENTING
Dennis Cox	Senior Plant Engineer	AECI
Josh Huber	Engineering CoOp	AECI

NAME OF DAM:	Pond 003	STATE ID #:	MO-0001171
INSPECTION DATE:	January 11, 2017	NID ID #:	N/A

OWNER:		CARETAKER:	
ORGANIZATION	Associated Electric Cooperative, I	ORGANIZATION	Associated Electric Cooperative, Inc.
NAME/TITLE	Mr. Dennis Cox	NAME/TITLE	Mr. Dennis Cox
STREET	P.O. Box 156	STREET	P.O. Box 156
TOWN, STATE, ZIP	New Madrid, MO 63869	TOWN, STATE, ZIP	New Madrid, MO 63869
PHONE		PHONE	
EMERGENCY PH. #		EMERGENCY PH. #	
FAX		FAX	
EMAIL		EMAIL	
OWNER TYPE	Private		

PRIMARY SPILLWAY TYPE	Decant Structure		
SPILLWAY LENGTH (FT)	N/A	SPILLWAY CAPACITY (CFS)	N/A
AUXILIARY SPILLWAY TYPE	N/A	AUX. SPILLWAY CAPACITY (CFS)	N/A
NUMBER OF OUTLETS	One	OUTLET(S) CAPACITY (CFS)	Unknown
TYPE OF OUTLETS	One Decant	TOTAL DISCHARGE CAPACITY (CFS)	Unknown
DRAINAGE AREA (SQ MI)	0.17	SPILLWAY DESIGN FLOOD (PERIOD/CFS)	Unknown
HAS DAM BEEN BREACHED OR OVERTOPPED? (YES/NO):	No	IF YES, PROVIDE DATE(S)	
FISH LADDER (LIST TYPE IF PRESENT)	Unknown		
DOES CREST SUPPORT PUBLIC ROAD? (YES/NO)	No	IF YES, ROAD NAME:	
PUBLIC BRIDGE WITHIN 50' OF DAM? (YES/NO):	No	IF YES, ROAD/BRIDGE NAME: MHD BRIDGE NO. (IF APPLICABLE)	

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 NID ID #: N/A

EMBANKMENT (CREST)

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
CREST	1. SURFACE TYPE	None observed	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	None observed	X		
	7. VEGETATION (PRESENCE/CONDITION)	None observed	X		
	8. ABUTMENT CONTACT	None observed	X		

ADDITIONAL COMMENTS: Ash mounds on the west side of the pond has been lowered, reducing the overall gravity load on the pond west bank.

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 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	N/A			
	5. SINKHOLE/ANIMAL BURROWS	None observed	X		
	6. EROSION	None observed	X		
	7. UNUSUAL MOVEMENT	None observed	X		
	8. VEGETATION (PRESENCE/CONDITION)	Woody vegitation at toe of slope removed.	X		

ADDITIONAL COMMENTS: The two dead trees that were within 50 feet of toe of slope have been removed.

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 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.	None observed	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: Ash has been stockpiled to an elevation equal to the embankment in the Northern portion of the Unlined Ash Pond. Therefore, the upstream slope was covered by ash and not visible for inspection.

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 NID ID #: N/A

INSTRUMENTATION

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
INSTR.	1. PIEZOMETERS	P-1 through P-3	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: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 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:

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 NID ID #: N/A

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
SPILLWAY	SPILLWAY TYPE	Decant structure	X		
	WEIR TYPE	Concrete stoplogs in decant structure	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	302	X		

ADDITIONAL COMMENTS:

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 NID ID #: N/A

OUTLET WORKS

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
OUTLET WORKS	TYPE	Outlet unable to be inspected. Downstream submerged in unlined creek.	X		
	INTAKE STRUCTURE	Decant structure with stoplogs	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. Woody vegetation along unlined creek	X		
	MISCELLANEOUS				

ADDITIONAL COMMENTS:

NAME OF DAM: Pond 003 STATE ID #: MO-0001171

INSPECTION DATE: January 11, 2017 NID ID #: N/A

UNDERLYING HYDRAULIC STRUCTURES/PIPES

AREA INSPECTED	CONDITION	OBSERVATIONS	NO ACTION	MONITOR	REPAIR
UNDERLYING HYDRAULIC STRUCTURES /PIPES	TYPE	Not observed			
	INLET				
	CONDUIT				
	OUTLET STRUCTURE/HEADWALL	Fair			
	EROSION ALONG STRUCTURE	None present			
	SEEPAGE/LEAKAGE	None present			
	DEBRIS/BLOCKAGE	None present			
	UNUSUAL MOVEMENT				
	DOWNSTREAM AREA				
	MISCELLANEOUS				

ADDITIONAL COMMENTS: Outlet pipe unable to be inspected. Downstream end of outlet was submerged in unlnied creek to Mississippi River.

Note: Use additional sheets for additional outlets.