

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No. MO-0001171

Owner: Associated Electric Cooperative, Inc., (AECI)
Address: 2814 South Golden, Springfield, MO 65801

Continuing Authority: Same as above
Address: Same as above

Facility Name: AECI, New Madrid Power Plant
Facility Address: PO Box 154, New Madrid, MO 63869

Legal Description: See page two (2)
Latitude/Longitude: See page two (2)

Receiving Stream: See page two (2)
First Classified Stream and ID: See page two (2)
USGS Basin & Sub-watershed No.: See page two (2)

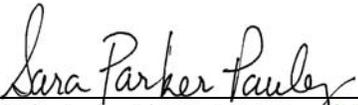
is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

The Associated Electric Cooperative, Inc. (AECI), New Madrid Power Plant (facility) is a steam electrical power generation primarily engaged in the generation of electricity for distribution and sale. This facility includes two (2) 615-megawatt coal-fired cyclone burner steam electric generating units (Unit 1 & Unit 2). Additionally, this facility has five (5) outfalls and one (1) combined outfall, which are further described on page two (2) and three (3) of this operating permit.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

April 22, 2011
Effective Date


Sara Parker Pauley, Director, Department of Natural Resources

April 21, 2016
Expiration Date


John Madras, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Outfall #001 - Industrial - SIC #4911 - Main Facility Outfall

Once through cooling water (condenser cooling water) and other Low Volume Waste Sources.
Design flow is 550 MGD.

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808057, Y = 4046791
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #002 - Industrial - SIC #4911

Once through cooling water (condenser cooling water) and other Low Volume Waste Sources.
Design flow is 546.5 MGD.

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808113, Y = 4046701
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #003 - Industrial - SIC #4911

Fly ash settling pond/fly ash landfill and other Low Volume Waste Sources including storm water run-off from coal pile.
Design flow is 38 MGD.

Legal Description: NW ¼, SW ¼, Sec. 33, T22N, R14E, New Madrid County
UTM Coordinates: X = 808632, Y = 4045364
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #004 - Industrial - SIC #4911

Boiler slag dewatering pond
Design flow is 7.5 MGD.

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808220, Y = 4046492
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #005 - Industrial - SIC #4911

Storm water run-off from plant site. Does not include coal pile storm water run-off.
Actual flow is depends on precipitation.

Legal Description: SW ¼, SW ¼, Sec. 29, T22N, R14E, New Madrid County
UTM Coordinates: X = 8086951, Y = 4046381
Receiving Stream: Tributary to Old Channel Little River (U)
First Classified Stream and ID: Old Channel Little River (C) (03037)
USGS Basin & Sub-watershed No.: (08020204 - 020007)

Outfall #006

This outfall has been eliminated.

FACILITY DESCRIPTION (continued):

Outfall #007 - Industrial - SIC #4911

Outfall #007 was created to incorporate the total temperature discharge for Outfalls #001 and #002 and other applicable pollutants of concern. Outfall #007 is not a physical outfall, but is needed for compliance tracking purposes due to the physical locations for Outfalls #001 and #002, which are in locations that effect the mixing considerations of both outfalls.

Design flow is 1096.5 MGD (Outfalls #001 and #002 combined)

Outfall #007 will use the same locational data as Outfall #001

Legal Description:	Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates:	X = 808057, Y = 4046791
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.:	(08010100 - 020005)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 4 of 15	
PERMIT NUMBER MO-0001171						
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001 & #002</u> (Note 1) Flow (Effluent) CFS * * once/day 24 hr. total Temperature (Effluent) °F * once/day grab						
<u>Outfall #003 & #004</u> (Note 2) Flow (Effluent) MGD * * once/day 24 hr. total Total Suspended Solids (Intake) mg/L * * once/month 24 hr. composite Total Suspended Solids (Net) mg/L 100 30 once/month 24 hr. composite Total Suspended Solids (Gross) mg/L * * once/month 24 hr. composite pH SU ** ** once/month grab Oil & Grease mg/L 15 10 once/month grab						
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>June 28, 2011</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
<u>Outfall #005</u> See Special Conditions #9, #10, #11, #12, & #13.						
Whole Effluent Toxicity (WET) test Outfall #003	% Survival	See Special Conditions #17			once/year	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>August 28, 2011</u> .						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Part I</u> STANDARD CONDITIONS DATED <u>October 1, 1980</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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PERMIT NUMBER MO-0001171

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #007</u> (Outfalls #001 + #002)						
Flow (Receiving Stream) (Note 3)	cfs	*			once/day	grab
Temperature (Receiving Stream) (Note 4)	°F	*			once/day	grab
Delta Temperature (Note 5)	°F	5		5	once/day	calculated***
Temperature Cap (Note 6 & 8)	°F				once/day	calculated***
January		50		50		
February		50		50		
March		60		60		
April		70		70		
May		80		80		
June		87		87		
July		89		89		
August		89		89		
September		87		87		
October		78		78		
November		70		70		
December		57		57		
Temperature Maximum (Note 7 & 8)	°F				once/day	calculated***
January		53		53		
February		53		53		
March		63		63		
April		73		73		
May		83		83		
June		90		90		
July		92		92		
August		92		92		
September		90		90		
October		81		81		
November		73		73		
December		60		60		

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE June 28, 2011. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Part I STANDARD CONDITIONS DATED October 1, 1980, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.
- *** For the parameters of Delta Temperature, Temperature Cap, and Temperature Max, the below calculations are to be used to determine compliance. For Delta Temperature, please use Note 4. For Temperature Cap, please use Note 5, and for Temperature Maximum, please use Note 6.

Note 1 – Outfalls #001 and #002 are not required to conduct regularly scheduled Whole Effluent Toxicity (WET) Testing. However, in the event that the permittee determines they must use a molluscicide or other toxic pollutants to remove organisms from intake structures, WET testing shall be conducted as described in the terms and conditions for WET testing for Outfall #001 and Outfall #002, which is contained in Part E - UNSCHEDULED EVENT, on page 15 of 15 of this operating permit.

Note 2 – Effluent limitations for TSS for Outfalls #003 and #004 are net limits. Credit for TSS in the intake water is authorized and subject to the following:

- (a) Only water withdrawn from the Mississippi River that is used for process water (e.g., fly ash transport) and subsequently discharged to the Mississippi River shall be used in calculating the net discharge limit for Total Suspended Solids. Credit for Total Suspended Solids from other sources of water (e.g., rainwater) shall not be used for credit.
- (b) Credit shall be granted only to the extent necessary to meet the Total Suspended Solids limit.
- (c) The maximum credit shall not exceed the concentration of Total Suspended Solids in the intake water after any treatment of the intake water.
- (d) All measures for flow and Total Suspended Solids must be made on the same day.
- (e) Net discharge is to be calculated as follows:

$$[(Q_d \times 8.34 \times C_d) - (Q_r \times 8.34 \times C_r)] / (Q_d \times 8.34) = \text{TSS Net in mg/L}$$

Where:

Q_d = Flow from Outfall #003 or #004 (in MGD).

C_d = Concentration in TSS measure in the final effluent from Outfall #003 or #004 (in mg/L);

Q_r = Intake flow (in MGD) that flows to either Outfall #003 or #004;

C_r = Intake flow TSS concentration (in mg/L).

- (f) If the permittee determines that additional non-Mississippi River source process waters internal compliance or monitoring points are needed in order to account for TSS concentrations, then the permittee shall submit an operating permit modification in order to add the additional permitted feature (i.e., internal sampling location).

Note 3 – Flow (Receiving Stream) is the measure in cubic feet per second (cfs) of the receiving stream. Obtaining appropriate stream flow data is the responsibility of the permittee.

Note 4 – Temperature (Receiving Stream) is the measure of temperature of the stream in °F. It is designated with $[T_s]$ in the following Notes below. For most facilities, the intake temperature can be used to determine receiving stream temperature; however, ambient stream temperature can also be used.

Note 5 – Delta Temperature is the amount in temperature °F that a facility is causing the receiving stream's temperature to raise at the end of the regulatory mixing zone. It is designated with $[\Delta T]$ in the equation below.

$$\Delta T = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)] - T_s$$

Where:

$Q_s/4$ = Daily receiving stream's flow divided by 4 (Mixing Consideration) in cfs minus the Intake flow in cfs.

T_s = Daily receiving stream's temperature. This can be the actual ambient temperature of the receiving stream or the intake water temperature (both in °F).

Q_e = Daily effluent flow or intake flow. For this facility, this is the combination of either Outfalls #001 + #002 effluent flow or the combination of the intake flow for #001 and #002.

T_e = Daily effluent temperature in °F. For this facility, this is the combination of Outfalls #001 + #002 effluent temperature.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Note 6 – Temperature Cap is the temperature of the receiving stream at the end of the regulatory mixing zone. It is designated with $[T_{cap}]$ in the equation below.

$$T_{cap} = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)]$$

Where:

$Q_s/4$ = Daily receiving stream's flow divided by 4 (Mixing Consideration) in cfs minus the Intake flow in cfs.

T_s = Daily receiving stream's temperature. This can be the actual ambient temperature of the receiving stream or the intake water temperature (both in °F).

Q_e = Daily effluent flow or intake flow. For this facility, this is the combination of either Outfalls #001 + #002 effluent flow or the combination of the intake flow for #001 and #002.

T_e = Daily effluent temperature in °F. For this facility, this is the combination of Outfalls #001 + #002 effluent temperature.

- (a) If the T_{cap} calculated temperature value is less than the specific month's Daily Maximum or Monthly Average T_{cap} , the permittee is to report the calculated temperature value as T_{cap} and report a "No Discharge" for T_{max} .
- (b) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} limit, but is below the T_{max} and there is time available in Percent Deviation Allowance (see **Note 8**); then the permittee is to report in accordance with **Note 7** below.
- (c) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} limit but is below the T_{max} , but there is no time available in Percent Deviation Allowance (see **Note 8**); then the permittee is to report the calculated temperature value as T_{cap} and report a "No Discharge" for T_{max} .
- (d) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} and T_{max} ; then the permittee is to report in accordance with **Note 7**.

Note 7 – Temperature Maximum is the maximum that a facility can increase the temperature of the receiving stream by at the end of the regulatory mixing zone. It is designated with the $[T_{max}]$ in the equation below and is the T_{cap} monthly limit plus three (+3°F).

$$T_{max} = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)]$$

Where:

$Q_s/4$ = Daily receiving stream's flow divided by 4 (Mixing Consideration) in cfs minus the Intake flow in cfs.

T_s = Daily receiving stream's temperature. This can be the actual ambient temperature of the receiving stream or the intake water temperature (both in °F).

Q_e = Daily effluent flow or intake flow. For this facility, this is the combination of either Outfalls #001 + #002 effluent flow or the combination of the intake flow for #001 and #002.

T_e = Daily effluent temperature in °F. For this facility, this is the combination of Outfalls #001 + #002 effluent temperature.

- (a) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} limit, but is below the T_{max} and there is time available in Percent Deviation Allowance (see **Note 8**); then the permittee is to report the calculated temperature value as T_{max} and report a "No Discharge" for T_{cap} .
- (b) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} and T_{max} ; then the permittee is to report the calculated temperature value as T_{max} and report a "No Discharge" for T_{cap} .

Note 8 – Missouri's Water Quality Standards allows permittees to exceed their applicable criteria for 1% of the year in Zone 2A (or C) in the Mississippi River. Percent Deviation Allowance shall be tracked in hours per year (please see **Special Condition 7 – Percent Deviation Allowance**).

D. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
 - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
 - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.
3. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established in Part A of the permit by the Director.
 - (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.
4. Report as no-discharge when a discharge does not occur during the report period.
 5. Water Quality Standards
 - (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
 - (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
 - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
 - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
 - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
 - (5) There shall be no significant human health hazard from incidental contact with the water;
 - (6) There shall be no acute toxicity to livestock or wildlife watering;
 - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
 - (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
 6. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

D. SPECIAL CONDITIONS (continued)

7. Percent Deviation Allowance

Site-specific temperature criteria for the thermal discharges to the Mississippi River allow the permittee to exceed their applicable temperature criteria for 1% of the year for Zone 1A and 2. This facility discharges to Zone 2 of the Mississippi River. Therefore, the permittee is authorized to exceed their Temperature Cap effluent limitation for 88 hours in one (1) calendar year. However, the permittee is not authorized to exceed their Temperature Max limitation at any time.

- (a) The permittee shall document the time in hours to the nearest minute that their calculated temperature values exceeded a specific month's Daily Maximum T_{cap} effluent limit. This time is to be subtracted from 88 hours to the nearest minute.
- (b) The permittee shall submit an annual report on January 28th of each year that includes the number of hours that the facility exceeded their Temperature Cap effluent limits for each month during the previous calendar year.
- (c) If the permittee exceeds their maximum allowed Percent Deviation Allowance of 88 hours prior to the end of the calendar year, then the permittee shall submit a Maximum Percent Deviation Exceeded Report to the Southeast Regional Office within 15 days of notice.
- (d) Percent Deviation Allowance is not applicable to the permit parameter of Temperature Maximum.

8. Specific plans for chemical cleaning of boilers shall be submitted to the Department's Southeast Regional Office at least 60 days prior to any such cleaning. Alternate monitoring requirements, additional effluent limitations, specified procedures, and any other necessary requirements may be required by the Department for the duration of the chemical cleaning.

9. The permittee shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must be kept on-site and should not be sent to DNR unless specifically requested. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in the following document:

Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in February 2009.

The SWPPP must include the following:

- (a) An assessment of all storm water discharges associated with this facility. This must include a list of potential contaminants and an annual estimate of amounts that will be used in the described activities.
- (b) A listing of specific Best Management Practices (BMPs) and a narrative explaining how BMPs will be implemented to control and minimize the amount of potential contaminants that may enter storm water. Minimum BMPs are listed in SPECIAL CONDITIONS #10 below.
- (c) The SWPPP must include a schedule for quarterly site inspections and a brief written report. The inspections must include observation and evaluation of BMP effectiveness, deficiencies, and corrective measures that will be taken. The Department must be notified within fifteen (15) days by letter of any corrections of deficiencies. Deficiencies that consist of minor repairs or maintenance must be corrected within seven (7) days. Deficiencies that require additional time or installation of a treatment device to correct should be detailed in the written notification. Installation of a treatment device, such as an oil water separator, may require a construction permit. Inspection reports must be kept on site with the SWPPP. These must be made available to DNR personnel upon request.
- (d) A provision for designating an individual to be responsible for environmental matters.
- (e) A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of DNR.

10. Permittee shall adhere to the following minimum Best Management Practices:

- (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of storm water from these substances.
- (b) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
- (c) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to storm water or provide other prescribed BMP's such as plastic lids and/or portable spill pans to prevent the commingling of storm water with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
- (d) Provide good housekeeping practices on the site to keep solid waste from entry into waters of the state.
- (e) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property.

D. SPECIAL CONDITIONS (continued)

11. This operating permit stipulates pollutant Benchmarks applicable to your discharge. The Benchmarks do not constitute direct numeric effluent limitations; a benchmark exceedance alone, therefore, is not a permit violation. Benchmark monitoring data are primarily for your use (and department's use as described in #1, above) to determine the overall effectiveness of your SWPPP and to assist you in knowing when additional corrective action may be necessary to protect water quality. If a sample exceeds a benchmark concentration you must review your SWPPP and your BMPs to determine what improvements or additional controls are needed to reduce that pollutant in your storm water discharge(s). Failure to improve BMPs and achieve compliance with the Benchmarks is a permit violation. Exceedances believed to be the result of legacy chemical uses at the facility are not exempted from this requirement. Permittees are encouraged to contact the Department to formulate a plan for investigation and clean-up if legacy chemical uses are suspected to be the cause of exceedances.
12. The below Benchmarks are considered necessary to protect water quality and shall not be exceeded. The BMPs at the facility should be designed to meet these benchmarks during rainfall events up to the 1-in-10 year, 24 hour rain event.

Benchmarks Table

Parameter	Benchmark
Settleable solids	1.5 mL/L/hr
Total Suspended Solids	50 mg/L
pH – Units	6.5-9.0 Standard Units
Oil & Grease	10 mg/L

13. Sampling and analysis for the Benchmarks in Special Condition 12 shall occur at least twice per year. One sample must be collected between January 1st and June 30th, and another sample between July 1st and December 31st. Reports are to be submitted by January 28th of each year. The department may also require sampling and reporting as a result of illegal discharges, compliance issues, complaint investigations, or evidence of off site impacts from activities from this facility. If such an action is needed, the department will specify in writing the sampling requirement, including such information as location and extent. It is a violation of this permit to fail to comply with said written notification to sample. If data becomes available that indicates existing water quality will be protected by alternative Benchmarks specific to this industry, the department will propose those Benchmarks into this permit as part of a permit modification. Such data must be approved by the department as appropriate and represent before it can be considered.
14. Use and disposal of Coal Ash
- (a) Disposal of ash is not authorized by this permit.
 - (b) This permit does not pertain to permits for disposal of ash or exemptions for beneficial uses of ash under the Missouri Solid Waste Management Law and regulations.
 - (c) This permit does not authorize off-site storage, use or disposal of ash in regard to water pollution control permits required under 10 CSR 20-6.015 and 10 CSR 20-6.200.
 - (d) An annual report shall be submitted by January 28th of each year for the previous calendar year period. The report shall include the quantity of ash generated; the cumulative quantity of ash stored on-site at the end of the year, including ash ponds; the quantity of ash sold or given away to each customer; and the intended use of the ash.
15. Coal Ash Impoundments
- (a) The permittee shall implement an effective groundwater monitoring program designed to determine if the unlined coal ash impoundment has an impact on groundwater quality within four (4) years from the effective date of this operating permit. The monitoring system must be capable of comparing up-gradient to down-gradient water quality in the first continuous water-bearing zone beneath the impoundment. The monitoring system must be based upon a thorough hydrogeologic characterization of the impoundment area that determines the appropriate hydrostratigraphic unit to monitor, its groundwater gradient(s) and any seasonal variations in its gradient(s). Any hydrogeologic characterization conducted for the design of the groundwater monitoring program shall be approved by the department's Geological Survey Program and must be conducted under the guidance of a geologist registered in the State of Missouri. The design of the groundwater monitoring program shall be approved by the department prior to installation. The number of monitoring wells required for the groundwater monitoring program shall be based on site-specific hydrogeologic conditions and sufficient for effective monitoring, but shall include a minimum of one up-gradient and three down-gradient wells.
 - (b) In order to accomplish this, the permittee shall:
 - (1) Submit the hydrogeologic characterization and monitoring well plan within one (1) year of the effective date of this operating permit;
 - (2) Upon approval of the hydrogeologic characterization and monitoring well plan, the permittee shall begin installation. Installation shall be completed within four (4) years from the effective date of this operating permit.

D. SPECIAL CONDITIONS (continued)

15. Coal Ash Impoundments (continued):

- (c) Upon the next submittal of the renewal application for this facility, the permittee shall submit a Toxic Characterization Report, not limited to analytical water testing from their coal ash impoundment and groundwater monitoring wells.
- (d) In the event that the United States Environmental Protection Agency promulgates regulations that affect coal ash impoundments, the permit may be re-opened to incorporate regulatory changes.

16. Cooling Water Intake

This permit may be reopened and modified, or alternatively revoked and reissued to: incorporate new or modified requirements applicable to existing cooling water intake structures under Section 316(b) of the Clean Water Act. In the event that, it is necessary for this permit to be reopened and modified, or alternatively revoked and reissued, permittee shall comply with any such new or modified requirements or standards applicable to existing cooling water intake structures under 316(b) of the Clean Water Act. Until such time that the 316(b) Phase II is promulgated, the permittee is required to continue operate intake structures as indicated in the 1970 and subsequent 2005 impingement studies.

17. Whole Effluent Toxicity (WET) Test shall be conducted as follows:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT				
OUTFALL	AEC	FREQUENCY	SAMPLE TYPE	MONTH
#003	2 %	Annually	24 hr. composite*	Sample any month, report in August.

* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampler.

Dilution Series #003							
AEC%	8% effluent	4% effluent	2% effluent	1% effluent	0.5% effluent	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a MULTIPLE-dilution acute WET test in the months and at the frequency specified above. For tests which are successfully passed, submit test results using the Department's WET test report form #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
 - (a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
 - (b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
 - (c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.
 - (d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.
 - (e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
 - (f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
 - (h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
 - (i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
 - (j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.

D. SPECIAL CONDITIONS (continued)

17. WET testing continued:

- (k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
 - (l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.
- (2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (3) If the effluent fails the test, a multiple dilution test shall be performed for BOTH test species within 30 calendar days and biweekly thereafter (for storm water, tests shall be performed on the next and subsequent storm water discharges as they occur, but not less than 7 days apart) until one of the following conditions are met:
- (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (4) Failure of a WET test is a violation of this permit.
- (5) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
- (6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
- (7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
- (8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
- (b) PASS/FAIL procedure and effluent limitations:
- (1) To pass a multiple-dilution test:
 - (a) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC) OF 30% OR LESS, the AEC must be less than three-tenths (0.3) of the LC₅₀ concentration for the most sensitive of the test organisms; **OR**,
 - (b) For facilities with an AEC greater than 30%, the LC₅₀ concentration must be greater than 100%; **AND**,
 - (c) All effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required.
- (c) Test Conditions
- (1) Test Type: Acute Static non-renewal
 - (2) All tests, including repeat tests for previous failures, shall include both test species listed below.

D. SPECIAL CONDITIONS (continued)

17. WET testing continued:

- (3) Test species: *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.
- (4) Test period: 48 hours at the "Allowable Effluent Concentration" (AEC) specified above.
- (5) Upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.
- (6) Unless otherwise specified above, multiple-dilution tests will be run with:
 - (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
 - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (c) Reconstituted water.
- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.
- (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

SUMMARY OF TEST METHODOLOGY FOR ACUTE WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms,

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

E. UNSCHEDULED EVENTS

The permittee is not required to conduct regularly scheduled Whole Effluent Toxicity (WET) Testing for their Outfalls #001 and Outfall #002. However, in the event that the permittee determines they must use a molluscicide or other toxic pollutants to remove organisms from intake structures for Unit #1 and/or Unit #2, the below Unscheduled WET testing event must be implemented.

- a. The permittee must inform the Department’s Southeast Regional Office that the cleaning of intake structures will be initiated.
- b. The permittee must conduct WET testing within ten (10) days after completion of the cleaning.
- c. The permittee must conduct the WET test on the appropriate Outfall for its specific Unit (i.e., if Unit #1 intake structure is cleaned, then the permittee must conduct WET testing on Outfall #001).
- d. The permittee must take all necessary steps to eliminate cross over (e.g., flows from Unit 1 being discharged to Outfall #002) until WET testing has been completed for the appropriate Outfall.
- e. Unit 1 and Unit 2 intake structures cleaning can not occur at the same time.
- f. The permittee will submit the WET testing results to the Department’s Water Protection Program on the 28th day of the following month after receiving the results.
- g. Whole Effluent Toxicity Testing for Outfalls #001 and Outfall #002:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT				
OUTFALL	AEC	FREQUENCY	SAMPLE TYPE	MONTH
#001 & #002	24 %	Annually	24 hr. composite*	Sample any month, report in August.

* A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampler.

Dilution Series #001 & #002							
AEC%	96% effluent	48% effluent	24% effluent	12% effluent	6% effluent	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

- h. The remaining WET testing terms and conditions are the same as established in Special Condition 15 (a), (b), and (c), and their subparts. Additionally, the SUMMARY OF TEST METHODOLOGY FOR ACUTE WHOLE-EFFLUENT TOXICITY TEST is also applicable.

Missouri Department of Natural Resources
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0001171
ASSOCIATED ELECTRIC COOPERATIVE, INC.,
NEW MADRID POWER PLANT

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for a Major , Minor , Industrial Facility ; Variance ;
Master General Permit ; General Permit Covered Facility ; and/or permit with widespread public interest .

Part I – Facility Information

Facility Type: INDUSTRIAL – Power Plant
Facility SIC Code(s): 4911

Facility Description:

The Associated Electric Cooperative, Inc. (AECI), New Madrid Power Plant (facility) is a steam electrical power generation primarily engaged in the generation of electricity for distribution and sale. This facility includes two (2) 615-megawatt coal-fired cyclone burner steam electric generating units (Unit 1 & Unit 2). Additionally, this facility has five (5) outfalls and one (1) combined outfall, which are further described below.

Outfall #001

This outfall is the facility's Unit 1 cooling water discharge and consist of cooling water, boiler blowdown, condensate polishing, neutralization sump (laboratory drains and de-mineralizers), screen wash, and HVAC process cooling. It also consist of intermittent and/or abnormal sources that consist of oil/water separator, slag tank emergency overflow, No. 3 sump, and #1 and #2 sumps (both units). It has a design flow of 550 MGD and an average flow of 483.8 MGD. For most of the sources that generate flow, there is no treatment. However, there is Neutralization treatment for the laboratory drains and de-mineralizers and flotation in the oil/water separator.

Outfall #002

This outfall is the facility's Unit 2 cooling water discharge and consist of cooling water, boiler blowdown, condensate polishing, oil/water separator, and screen wash. It also consist of intermittent and/or abnormal sources that consist of slag tank emergency overflow, #3 sump, and #1 and #2 sumps – both units. Additionally, the oil/water separator receives wastewater from: slag tank emergency overflow, #3 sump, #1 and #2 sump (both units), yard and floor drains, and auxiliary cooling water overflow. Oil removed from the separator is applied to the coal pile as fuel or removed off-site by a used oil contractor. It has a design flow of 546.5 MGD and an average flow of 413.5 MGD. The only source water that is treated is in the oil/water separator via flotation.

The oil/water separator receives wastewater from slag, tank emergency overflow; #3 sump (both units); #1 & #2 sumps (both units); yard and floor drains and auxiliary cooling water overflow. Oil removed from the separator is either applied to the coal pile as fuel or removed off-site by a used oil contractor.

Outfall #003

This outfall is the facility’s ash pond. Sources consist of boiler slag sluicewater, slag wash water, coal pile run-off, dry fly ash handling, stormwater collection pond from landfill, air heater wash, and chemical cleaning. It also includes coal conveyor wash, coal handling dust suppression, Unit 1 heater vents, heavy machinery wash, Unit 1 & 2 yard drains.

Boiler slag is washed at the ash settling pond by a contractor and removed from the site. Residue from slag washing, plant ditch clean-out and coal residues are disposed in the utility’s waste landfill. Fly ash is normally disposed in the landfill; except during equipment downtimes. During equipment downtime, fly ash is disposed in the ash pond(s).

Air heaters are cleaned approximately once per year with a generation rate of 5 million gallons per cleaning. The discharge rate of air heater wash to the ash pond is approximately 0.252 MGD per cleaning.

Boilers are chemically cleaned every 3 – 5 years with a generation rate of approximately 0.660 MGD per unit. During a typical boiler cleaning, approximately 4430 pounds of Iron is removed. The resulting wastes from chemically cleaned boilers are typically disposed by evaporation in a boiler. Chemically cleaned wash may be; however, treated in the ash pond system.

Outfall #004

This outfall consist of boiler slag dewatering pond, which includes sources from boiler slag sluicewater and precipitation. Boiler slag is dewatered, stockpiled and loaded onto barges or trucked off-site for reuse.

Outfall #005

This outfall consist of storm water run-off from the facility’s grounds. Sources of the storm water run-off include boiler roof drains, turbine roof drains, substation yard drains, plant site run-off, and agricultural run-off. Some intermittent sources include safety valve drains, boiler drain tank overflow, and air tower overflow.

Outfall #006

On April 3, 2009, the department received AECI March 31, 2009, letter indicating that Outfall #006 was eliminated. The letter indicated that, “Outfall #006 was added to the NPDES permit at the time the landfill was constructed. Due to an operational change, approved by the Solid Waste Management Program, this outfall was eliminated.

Outfall #007

This outfall was created to incorporate the total temperature discharge for Outfalls #001 and #002. This is not an actual outfall, but is needed for compliance tracking purposes. Please see comment section below.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation?

- No.

Application Date: 10/31/2007
Expiration Date: 05/01/2008
Last Inspection: 04/08/2010 In Compliance ; Non-Compliance

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
#001	852.5	None	Industrial	0.0
#002	847.1	None	Industrial	0.0
#003	58.9	Primary	Industrial	0.0
#004	11.6	Primary	Industrial	0.0
#005	2.3	BMPs/SWPPP	Storm water & Industrial	15.05

Outfall #001

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808057, Y = 4046791
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #002

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808113, Y = 4046701
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #003

Legal Description: NW ¼, SW ¼, Sec. 33, T22n, R14E, New Madrid County
UTM Coordinates: X = 808632, Y = 4045364
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #004

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808220, Y = 4046492
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Outfall #005

Legal Description: SW ¼, SW ¼, Sec. 29, T22N, R14E, New Madrid County
UTM Coordinates: X = 8086951, Y = 4046381
Receiving Stream: Tributary to Old Channel Little River (U)
First Classified Stream and ID: Old Channel Little River (C) (03037)
USGS Basin & Sub-watershed No.: (08020204 - 020007)

Outfall #006 – Outfall Eliminated

Outfall #007 – Combined cooling water for Outfall #001 & #002. Locational data was obtained from Outfall #001.

Legal Description: Land Grant 1107, T22N, R14E, New Madrid County
UTM Coordinates: X = 808057, Y = 4046791
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P) (03152) 303(d)
USGS Basin & Sub-watershed No.: (08010100 - 020005)

Receiving Water Body's Water Quality & Facility Performance History:

The Mississippi River has been listed on the Missouri 2006 – 2008 303(d) List for Total Mercury from Atmospheric Deposition.

Outfall #004 had TSS violations for June 2005 and August 2006.

Outfall #005 had TSS violations for September 2007 and 2009.

Comments:

The 2007 renewal application also included two (2) additional outfalls; however, in a later correspondence dated March 31, 2009, AECI indicated that these outfalls were no longer needed. Therefore, Outfalls #007 and #008 (as initially requested) will not be included in this operating permit. However, Outfall #007 was added back to the permit for a combination Outfall of Outfalls #00& #002.

Domestic sewage produced at this facility is pumped to and treated at the St. Jude Industrial Park Wastewater Treatment Facility. Domestic waste from the precipitator electrical building discharges to a septic tank and lateral line system.

Comments (continued):

The distance from Outfall #001 to Outfall #002 is approximately 345 ft. This distance between the outfalls, for the purpose of drafting this operating permit and fact sheet, has been determined to have significant potential regarding the effects of each outfall's thermal mixing zones. Therefore, compliance with thermal/temperature criteria and any other Water Quality Standards (with mixing considerations) will utilize a total effect from both outfalls. Therefore, Outfall #007 was created to determine compliance for combined effect of Outfalls #001 and #002.

In addition to Outfall #001 and #002, Outfall #004 is approximately 1,108 feet below Outfall #001 and 763 feet below Outfall #002; however, the pollutants that are commonly associated with the thermal outfalls (#001 and #002) and the boiler slag dewatering pond (#004) are not similar; therefore, mixing considerations for Outfall #004 is not effected by Outfalls #001 and #002.

On July 24, 2009, the Department sent a draft operating permit for this facility onto Public Notice. The draft operating permit removed limitations for Outfall #005 and replaced the limits with a SWPPP. However, staff drafting this operating permit noted effluent violations for Outfall #005. Therefore, for the duration of this operating permit, the permit will require both limits for Outfall #005 with increased monitoring to determine if the SWPPP is reducing TSS concentrations. Future renewals or modification to this permit may remove Outfall #005's limitations depending on the effectiveness of the SWPPP.

It has been determined by the department and the US EPA (Region VII) that the ΔT of +/- 5°F Water Quality Standards is applicable to all waters of the state including the Mississippi River.

Pollutants Typically Associated with Stream Electric Industry Discharges:

Additionally, staff has reviewed the renewal applications Form C and D for each of the outfalls for this operating permit with exception to Outfall #007. Effluent testing results contained in Form C and D for each outfall were compared directly with pollutants associated with the various waste streams for each of the outfalls as established in the United States EPA document, *Interim Detailed Study Report for the Steam Electric Power Generating Point Source Category* (Interim Study Report). Pollutants contained in the Interim Study Report are based on data previously collected by the EPA during the 1974 and 1982 rulemaking efforts and the 1996 Preliminary Data Summary, data provided by the Utility Water Act Group (UWAG) and Electric Power Research Institute (EPRI). Below is the list of pollutants based on process waste streams:

- **Cooling Water: Once-through or Cooling Tower Blowdown.**
Chlorine, Iron, Copper, Nickel, Aluminum, Boron, Chlorinated Organic Compounds, Suspended Solids, Brominated Compounds, and Non-oxidizing Biocides.
- **Ash Handling: Bottom or Fly Ash.**
TSS, Sulfate, Chloride, Magnesium, Nitrate, Aluminum, Antimony, Arsenic, Boron, Cadmium, Chromium, Copper, Cyanide, Iron, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc
- **Coal Pile Runoff:**
Acidity, COD, Chloride, Sulfate, TSS, Aluminum, Antimony, Arsenic, Boron, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc.
- **Other Low-Volume Waste Streams:**
Suspended solids, Dissolved Solids, Oil & Grease, Phosphates, Surfactants, Acidity, Methylene Chloride, Phthalates, BOD₅, COD, Fecal Coliform, and Nitrates.

For the above pollutants, staff drafting this operating permit only compared the applicable pollutants based on Missouri's Water Quality Standards criteria and designated uses. For any of the outfalls that do not contain one of the process wastewater types above, these pollutants were not reviewed (i.e., Outfall #005). For Outfall #005, staff drafting this operating permit and fact sheet reviewed the applicable Form C to determine if effluent from this outfall had potential to exceed Missouri's Water Quality Standards for the tested pollutants.

For discussion on BPJ TBEL determination, please see **APPENDIX B – TBEL DETERMINATION**.

Part II – Operator Certification Requirements

Not Applicable ; This facility is not required to have a certified operator.

Part III – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri’s Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall’s Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]:
- Lake or Reservoir [10 CSR 20-7.015(3)]:
- Losing [10 CSR 20-7.015(4)]:
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]:
- Special Stream [10 CSR 20-7.015(6)]:
- Subsurface Water [10 CSR 20-7.015(7)]:
- All Other Waters [10 CSR 20-7.015(8)]:

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and/or 1st classified receiving stream’s beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Unnamed Tributary to Old Channel Little River	U	---	General Criteria	08020204	MS Alluvial Basin/ St. Francis/ Little
Old Channel Little River	C	03037	LWW, AQL, WBC(B)***		
Mississippi River	P	03216	IRR, LWW, AQL, WBC(B)****, SCR, DWS	08010100	MS Alluvial Basin/ St. Johns Bayou

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

** - Ecological Drainage Unit

*** - UAA conducted in 2005, no determination at this time. Therefore, WBC(B) is applicable.

**** - UAA has not been conducted.

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE FOR TOXICS AND NON-CONVENTIONAL POLLUTANTS:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed tributary to Old Channel Little River	0.0	0.0	0.0
Mississippi River*	93,874	107,694	126,115

* - Low-Flow values derived from adding 1Q10, 7Q10, 30Q10 (respectively) from USGS Gauging Station Mississippi River at Thebes #07022000 and Ohio River at Metropolis #03611500. Low flows from April 1964 to April 2009 were used.

MIXING CONSIDERATIONS TABLE FOR TOXICS AND NON-CONVENTIONAL POLLUTANTS: (MISSISSIPPI RIVER)

MIXING ZONE (CFS) [10 CSR 20-7.031(4)(A)4.B.(III)(a)]		ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(4)(A)4.B.(III)(b)]	
7Q10	30Q10	1Q10	7Q10
26, 924	31,529	2,347	2,692

For the Unnamed tributary to Old Channel Little River, Mixing Considerations are not allowed per the following regulations:

Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].

Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

MIXING CONSIDERATIONS FOR TEMPERATURE: (MISSISSIPPI RIVER)

Missouri's Water Quality Standards [10 CSR 20-7.031(4)(A)1.], specifically state that mixing considerations for toxics do not apply to thermal mixing considerations and that thermal mixing considerations are located in [10 CSR 20-7.031(4)(D)6.], which states thermal mixing considerations are limited to 25% of the cross-sectional area or volume of a river, unless a biological survey performed in response to 316(a) of the Clean Water Act indicate no significant adverse effect on aquatic life. For the purpose of mixing considerations, the Department uses the 25% of the daily flow vs cross-sectional area. For a more detailed determination and discussion of thermal mixing, please see **Appendix (A) – Temperature Limit Derivation Method.**

RECEIVING STREAM MONITORING REQUIREMENTS:

No receiving water monitoring requirements recommended at this time.

Part IV – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

Not Applicable - This facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- All limits in this operating permit are at least as protective as those previously established; therefore, backsliding does not apply.

ANTIDegradation:

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- Renewal no degradation proposed and no further review necessary.

COAL COMBUSTION RESIDUALS (CCR):

Coal Combustion Residuals (CCR), often referred to as coal ash, is currently considered exempt wastes under an amendment to RCRA, the Resource Conservation and Recovery Act. Coal ash is residues from the combustion of coal in power plants and captured by pollution control technologies, like scrubbers. Potential environmental concerns from coal ash pertain to pollution from impoundment and landfills leaching into ground water and structural failures of impoundments.

The US EPA is currently proposing the first-ever national rules to ensure the safe disposal and management of coal ash from coal-fired power plants under the nation's primary law for regulating solid waste, the RCRA. The EPA is putting forward two (2) proposals that reflect different approaches to managing the disposal of coal ash and both are to ensure the safe management of coal ash that is disposed in surface impoundments and/or landfills.

Both options will provide for the first time on a national basis that liners and ground water monitoring are in place at new landfills handling coal ash and impoundments in order to prevent leaching of contaminants to groundwater and resulting risks to human health. Under the **Subtitle C** proposal, EPA is adopting measures intended to phase out the wet handling of CCRs and existing surface impoundments; under the **Subtitle D** proposal, existing impoundments would require liners, which will create strong incentives to close these impoundments and transition to safer landfills which store coal ash in dry form. Both proposals will ensure stronger oversight of the structural integrity of impoundments. Additionally, both options will require liners and groundwater monitoring, and corrective action if there is any contamination detected. For the Subtitle D Option, the corrective action requirements are not as extensive.

The New Madrid Power Plant has three ash ponds: (1) the original ash pond; (2) a lined boiler slag dewatering pond; and (3) a lined fly ash pond. The original ash pond was constructed in 1972, contains no liner, and is approximately 110 acres. The pond contains all fly ash that was generated from initial plant start-up in 1972 until 1994. There is likely an accumulation of some boiler slag; however, most all slag was sold from the plant. The pond is actively used by Reed Mineral to wash and size boiler slag for off-site use...

CCR continued:

...The majority of boiler slag is sluiced to this pond where it is recovered by Reed Mineral and processed. Reed Mineral has contracted with AECI for purchase of all boiler slag. Reed Mineral transfers the slag off site by trucks or to the slag dewatering pond for temporary storage. Reject boiler slag is transported to the utility waste landfill for disposal. This pond is also used to treat other wastewaters, e.g. coal pile runoff.

The boiler slag dewatering pond was constructed in 1984, is approximately 10 acres in size with a compacted low permeability soil liner that meets the Departments permeability standard. The pond is used primarily to store boiler slag, on occasion boiler slag is sluiced to the pond for dewatering for off-site sale. There is no accumulation of boiler slag below the water level in this pond.

The lined fly ash pond is located adjacent the original ash pond is approximately 78 acres in size and is lined with a compacted low permeability soil / HDPE composite liner that meets the Departments permeability standard. During the coal conversion in 1994, the wet fly ash sluice system was discontinued and a dry fly ash handling system was installed. Fly ash was transported to this pond via enclosed tank trailers, and unloaded by air pressurizing the tank car and transferring the dry fly ash from the trucks by water to the pond. Water present in the pond was recycled for this transfer system. The lined fly ash pond does not routinely receive fly ash from the plant. On occasion when the paddle mixer is non-operational it is necessary to dispose of fly ash in the lined ash pond by use of the enclosed tank trailers. Storm water from the utility waste landfill is pumped to this pond. An overflow from this pond discharges to the adjacent original ash pond. The pond contains all fly ash that was generated between 1994 and 2008 and fly ash that it presently receives when the paddle mixer is not operational. In 2008 a utility waste landfill was constructed where all fly ash is now disposed. Dry fly ash is mixed with a moderate amount of water in a paddle mixer then transferred to the landfill in dump trucks.

This operating permit will contain a special condition to address concerns regarding ash ponds at this facility and their potential to impact groundwater. Missouri Water Quality Standard 10 CSR 20-7.031(5)(A) states, “*Water contaminants shall not cause or contribute to exceedances of Table A, groundwater limits in aquifers and caves...*” The established special condition will allow the department to (1) determine if groundwater is being impacted from either the lined or unlined coal ash impoundments, (2) establish controls, limits, management strategies, and/or groundwater cleanup criteria.

BIO-SOLIDS, SLUDGE, & SEWAGE SLUDGE:

Bio-solids are solid materials resulting from wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sludge is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works.

Not Applicable ;

Domestic wastewater generated at this facility is pumped to the St. Jude Industrial Park Wastewater Treatment Facility. Therefore, this condition is not applicable to the permittee for this specific facility.

COMPLIANCE AND ENFORCEMENT:

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

Not Applicable ;

The permittee/facility is not currently under Water Protection Program enforcement action.

INTAKE WATER CREDITS (NET LIMITS):

In accordance with federal regulation 40 CFR 122.45(g), technology-based effluent limitations or standards shall be adjusted to reflect credit for pollutants in the discharge's intake water if: (1) The applicable effluent limitations and standards contained in 40 CFR subchapter N specifically provide that they shall be applied on a net basis; or (2) The discharger demonstrates that the control system it proposes or uses to meet applicable technology-based limitations and standards would, if properly installed and operated, meet the limitations and standards in the absence of pollutants in the intake waters. Additionally, credit for generic pollutants such as biochemical oxygen demand (BOD) or total suspended solids (TSS) should not be granted unless the permittee demonstrates that the constituents of the generic measure in the effluent are substantially similar to the constituents of the generic measure in the intake water or unless appropriate additional limits are placed on process water pollutants either at the outfall or elsewhere. Credit shall be granted only to the extent necessary to meet the applicable limitation or standard, up to a maximum value equal to the influent value. Additional monitoring may be necessary to determine eligibility for credits and compliance with permit limits. Credit (Net Limits) do not apply to the discharge of raw water clarifier sludge generated from the treatment of intake water.

PRETREATMENT PROGRAM:

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Not Applicable - The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

REASONABLE POTENTIAL ANALYSIS (RPA) FOR TOXIC & NON-CONVENTIONAL POLLUTANTS:

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard. In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

Chlorination for Outfalls #001 and #002

Chlorination (Free Available and/or Total Recoverable) as established in 40 CFR 423.12 and 423.13 is not applicable to this facility for once through cooling water due to the fact that this facility does not chlorinate. Additionally, WET testing as a schedule condition will not be applied to this facility due to the fact that they do not use pesticides for organisms (e.g., zebra mussels) that obstruct their intake structure. However, the permittee has requested an unscheduled event with regards to WET testing. Please see Outfall #001 and #002 for a more detailed description of WET testing conditions.

Metals – Aluminum, Iron, & Selenium (Total Recoverable) – for Outfall #003

Staff drafting this operating permit reviewed the renewal application for this facility, which contained required testing for a vast number of pollutants. Most pollutants analyzed were well below Missouri's Water Quality Standards and/or Minimum Detection Limits. There were; however, three (3) pollutants that did have elevated testing results that include Aluminum, Iron, and Selenium. Upon further review and analysis and discussion with AECI representatives, it has been determined that the three (3) metals do not have a reasonable potential to cause or contribute to exceedances of Missouri's Water Quality Standards. Therefore, this operating permit will not contain language or conditions for additional monitoring.

Whole Effluent Toxicity Testing – Outfall #004

Staff drafting this operating permit has reviewed the renewal application and other appropriate sources regarding establishing a WET test for Outfall #004. Previous state operating permits for this facility did not include WET testing for Outfall #004; therefore, staff could not conduct a statistical Reasonable Potential Analysis. However, in accordance with the EPA's Technical Support Document – Water Quality-based Toxic Controls, staff has determined that Outfall #004 will not contain a WET test via Independent Application. Staff drafting this operating permit has determined that the WET testing conducted on Outfall #003 is a representative sample for Outfall #004. This is due to the fact that Outfall #003 contains both fly ash water and other low-volume sources. However, Outfall #004 only contains boiler slag sluice water. Because boiler slag is a part of the same combustion residuals as fly ash, WET testing on Outfall #003 has more potential for determining if water used for fly ash transport vs. sluice water is toxic to aquatic life. Additionally, Outfall #003 contains additional loading from other sources with an average flow of 7.733 MGD with a maximum flow of 53.995 MGD. Outfall #004 has an average flow of 1.841 MGD with a maximum of 15.980 MGD. Additionally, boiler slag, after it is dewatered, is stockpiled and loaded onto barges or trucks and is transported off-site for reuse.

REMOVAL EFFICIENCY:

Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD₅) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals. Please see the United States Environmental Protection Agency's (EPA) website for interpretation of percent removal requirements for National Pollutant Discharge Elimination System Permit Application Requirements for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage @ www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm.

Not Applicable ;
Influent monitoring is not being required to determine percent removal.

SANITARY SEWER OVERFLOWS (SSOs), BYPASSES, INFLOW & INFILTRATION (I&I) – PREVENTION/REDUCTION:

Sanitary Sewer Systems (SSSs) are municipal wastewater collection systems that convey domestic, commercial, and industrial wastewater, and limited amounts of infiltrated groundwater and storm water (i.e. I&I), to a POTW. SSSs are not designed to collect large amounts of storm water runoff from precipitation events.

Untreated or partially treated discharges from SSSs are commonly referred to as SSOs. SSOs have a variety of causes including blockages, line breaks, sewer defects that allow excess storm water and ground water to overload the system, lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. A SSO is defined as an untreated or partially treated sewage release from a SSS. SSOs can occur at any point in an SSS, during dry weather or wet weather. SSOs include overflows that reach waters of the state. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations. SSSs can back up into buildings, including private residences. When sewage backups are caused by problems in the publicly-owned portion of an SSS, they are considered SSOs.

Not Applicable ;

This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri State Environmental Laws and Regulations to allow untreated wastewater to discharge to waters of the state.

SCHEDULE OF COMPLIANCE (SOC):

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

- Not applicable: There are no Schedules of Compliance in this operating permit.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.

- Applicable: A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.

TEMPERATURE LIMITS CONSIDERATIONS:

The temperature limits contained in this operating permit are based on Missouri's Temperature Guidance (**see Appendix A**). Missouri's Water Quality Standards establish Temperature Criteria that provide several forms of protection from the impacts of heat energy on receiving water bodies. The purpose of the Temperature Limit Guidance is to provide an approach to help both permit writers and the public understand Temperature Criteria and how they are applied in Missouri State Operating Permits.

This approach assumes that the receiving water consumes 100% of the heat energy being discharged. At any time the permittee has reason to believe that their facility discharge may exceed their permit temperature limits or if the permittee does exceed their permit limit, the permittee may determine it necessary to take action that may include, but not limited to, seeking a 316(a) Variance, a Mixing Zone Study, or conduct a "Heat Model".

If action is taken by the permittee that warrants a modification to this operating permit, then the permittee will need to submit an application for a permit modification. Submitting an application for permit modification does not guarantee approval of said action and does not directly indicate that the result of said action will be implemented into an operating permit. A Quality Assurance Project Plan (QAPP) must be submitted for any alternative compliance approach.

VARIANCE:

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

- Not Applicable: This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable :

Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

WLA MODELING:

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

Not Applicable :

A WLA study was either not submitted or determined not applicable by Department staff.

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Applicable ;

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(3)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by all facilities meeting the following criteria:

- Facility is a designated Major.
- Facility continuously or routinely exceeds its design flow.
- Facility (industrial) that alters its production process throughout the year.
- Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH₃)
- Facility is a municipality or domestic discharger with a Design Flow \geq 22,500 gpd.
- Other – please justify.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

Applicable ;

The Mississippi River is listed on the 2006 and 2006 303(d) List of impaired waters for Mercury from Atmospheric Deposition.

– This facility’s effluent is not considered to be a source of the above listed pollutant(s) or considered to contribute to the impairment of the Mississippi River.

316(a) THERMAL VARIANCE

Section 316(a) of the Clean Water Act (CWA) applies to point sources with thermal discharges. It authorizes the NPDES permitting authority to impose alternative effluent limitations for the control of the thermal component of a discharge in lieu of the effluent limits that would otherwise be required under section 301 or 306 of the CWA.

Regulations implementing section 316(a) are codified at 40 CFR Part 125, subpart H. These regulations identify the criteria and process for determining whether an alternative effluent limitation (i.e., thermal variance from the otherwise applicable effluent limit) may be included in a permit and, if so, what that limit should be. This means that before a thermal variance can be granted, 40 CFR Parts 125.72 and 125.73 require the permittee to demonstrate that the protection and propagation of the waterbody’s balanced, indigenous population (BIP) of shellfish, fish, and wildlife is being attained.

The burden of proof is on the permittee to demonstrate that it is eligible to receive an alternative thermal effluent limit under section 316(a). This means the permittee must demonstrate to the Missouri Department of Natural Resources that a thermal effluent limit necessary to meet the requirements of sections 301 or 306, specifically 10 CSR 20-7.031(4)(D)1 and 10 CSR 20-7.031(4)(D)5, is more stringent than necessary to assure the protection and propagation of a BIP in and on the body of water into which the discharge is made.

316(a) Thermal Variance (continued):

- No Demonstration of 316(a) Variance

At this time, the permittee is not operating under a 316(a) Variance and has not requested a 316(a) Variance. If during the cycle of this operating permit the permittee determines that a 316(a) Variance is needed, the permit will contain language indicating that the permit can be reopened and modified, or alternatively revoked and reissued to: incorporate new or modified requirements applicable to implementing a department approved 316(a) Variance.

316(b) COOLING WATER INTAKE STRUCTURE

Section 316(b) of the Clean Water Act (CWA) applies to new or existing facilities operating a cooling water intake structure (CWIS). Section 316(b) requires that location, design, construction, and capacity of CWISs reflect the best technology available (BTA) for minimizing adverse environmental impacts (AEI). Under current regulations, existing facilities are subject to section 316(b) conditions that reflect BTA for minimizing AEI on a case-by-case, best professional judgment (BPJ) basis.

The Environmental Protection Agency's (EPA) Phase II Section 316(b) Existing Facilities Rule was remanded to the EPA in *Riverkeeper, Inc. et al. v EPA* 475 F.3d 83 (2d Cir. 2007). The Federal Water Pollution Control Act Amendments of 1972 require cooling water intake structures to reflect the best available technology for minimizing adverse environmental impact. Best technology available must consider intake design, location, construction, and capacity.

The New Madrid Power Plant is equipped with once-through condenser cooling systems. Water is drawn in through two off shore intake structures located in the Mississippi River near the main channel. Under normal flow conditions, these structures are under water. To minimize impingement and entrainment of fish and shellfish, the intake structures are designed to promote horizontal flow while minimizing vertical flow. Each structure has three sides open to horizontal flow and a concrete panel velocity cap. When river levels are low, floating, horizontal supplemental pumps are used to pump water into the intake structures. The physical locations of the intakes are away from principal spawning areas, nursery/feeding areas, and high fish population areas. Being located off shore fish

316(b) Cooling Water Intake Structure (continued):

...migratory pathways are not affected. This area of the Mississippi River, near the main channel, is characterized by swift current and shifting substratum which does not present a preferred fish habitat.

An impingement study was conducted in 2005 along with a biological characterization study conducted in 2005/2006. The biological characterization study was to provide a description of the abundance and temporal and spatial characterization of the community potentially vulnerable to impingement. Historical studies conducted between 1975 and 1979 concluded the intake structures did not have significant adverse environmental impacts and that the structures met the requirements of Section 316(b). Because the intake structure equipment and operation are essentially the same as the time of the original study, Associated Electric Cooperative, Inc. believes that the conclusion of the 1970s study is still valid.

The operating permit will contain language indicating that the BTA in use by the New Madrid Power Plant is sufficient for minimizing AEI. Additionally, the operating permit will contain language indicating the established BTA's in use at this facility are adequate. The operating permit will also contain language indicating that the permit may be reopened and modified, or alternatively revoked and reissued to: incorporate new or modified requirements applicable to existing cooling water intake structures under Section 316(b) of the Clean Water Act consistent with any standard established pursuant to section 1311 or section 1316 of 33 USC 1326. In the event that, it is necessary for this permit to be reopened and modified, or alternatively revoked and reissued, permittee shall comply with any such new or modified requirements or standards applicable to existing cooling water intake structures under 316(b) of the Clean Water Act.

Part V – Effluent Limits Determination

Outfall #001 & #002 – Once Through Cooling Water Outfalls.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW (EFFLUENT)	CFS	1	*		*	NO	
TEMPERATURE (EFFLUENT)	°F	3,9	*			YES	**
WHOLE EFFLUENT TOXICITY (WET) TEST	% Survival	11	Please see WET Test in the Derivation and Discussion Section below.				
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #001 & #002 – DERIVATION AND DISCUSSION OF LIMITS:

With regard to the monitoring conditions above, the permit shall state that the above parameters are not to be averaged between Outfall #001 and #002 and reported separately. Because the two (2) outfalls discharge in close proximity to each other, compliance determination is the combination of the two (2) outfalls. The combination of these two (2) outfalls is contained in the newly formed Outfall #007.

Missouri’s Water Quality Standards (WQS) Temperature Criteria [10 CSR 20-7.031(4)(D)] establishes two (2) main areas of compliance for general and limited warm-water fisheries. The first compliance requirement deals with the rise of temperature in the stream, and the second compliance requirement deals with the overall stream’s temperature. The below parameters will aid in the determination of compliance for this facility.

- **Flow (Effluent).** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Temperature (Effluent).** Daily monitoring only requirement in °F. Temperature (Effluent) is the measured temperature of the discharge and is not the measured difference between the intake temperature and the discharge temperature.
- **WET Test.** This facility is not required to be conduct WET Testing for Outfalls #001 and #002 due to the fact that this facility does not chlorinate or use pesticides for the removal of organisms (e.g., zebra mussels) that obstruct or can obstruct their intake sources for cooling water. However, the permittee has requested the ability to conduct WET Testing should they believe that a need arises during the life of this operating permit. If the permittee determines the need for WET Testing, the operating permit will contain language that indicates they are to inform the department at a minimum of 30 days prior to testing to occur. Additionally, the WET Testing shall be established in the operating permit as an “Unscheduled Event” and the frequency can occur as determined by the permittee. However, if the permittee determines that WET Testing need to be conducted at a frequency of annually or more frequent, the permit should contain language that will require the permittee to submit a permit modification for the addition of WET testing into the permit, which will most likely be established at a frequency of once per year or more and may even be modified to include chronic WET testing.

WET test continued:

Additionally, due to the location of the outfalls #001 and #002, the permit will establish that WET testing and the use of chemicals for the cleaning of the intake, can not occur at the same time. The cleaning and the WET testing will need to be separate events in order to avoid the issue of mixing considerations and their outfalls. Additionally, in order to conduct cleaning and WET testing, Unit #1 flow (intake, condensers, outfall) will need to be closed to flows from Unit #2 and the same for Unit #2 with respect to Unit #1 flows.

Both outfalls will have Acute WET testing should the permittee determine the need for WET testing as follows:

Outfall #001

$$\text{Acute AEC\%} = ((\text{design flow}_{\text{cfs}} + \text{ZID}_{7\text{Q}10}) / \text{design flow}_{\text{cfs}})^{-1}] \times 100 = \text{##\%}$$
$$\text{Acute AEC\%} = ((852.5_{\text{cfs}} + 2692) / 852.5)^{-1}] \times 100 = 24.05\% \text{ rounded down to } 24 \%$$

Outfall #002

$$\text{Acute AEC\%} = ((\text{design flow}_{\text{cfs}} + \text{ZID}_{7\text{Q}10}) / \text{design flow}_{\text{cfs}})^{-1}] \times 100 = \text{##\%}$$
$$\text{Acute AEC\%} = ((847.1_{\text{cfs}} + 2692) / 847.1)^{-1}] \times 100 = 23.9\% \text{ rounded up to } 24 \%$$

The Dilution Series for both outfalls is as follows:

96%, 48%, 24%, 12%, 6%.

- **Minimum Sampling and Reporting Frequency Requirements.** For the parameters of Flow (effluent), Temperature (effluent), and pH, the minimum monitoring requirement will be established as once per day. The WET testing will be conducted as determined appropriate by the permittee.

Outfall #007 (Outfall #001 + #002) – Combined Once Through Cooling Water Outfalls

Outfall #007 is not an actual outfall, but is the combined discharge of Outfall #001 and #002. Parameters from Outfall #001 and #002 will be combined and/or averaged to determined compliance with Missouri Water Quality Standards' Temperature Criteria.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
STREAM FLOW	CFS	2,3	*			YES	**
TEMPERATURE (STREAM)	°F	2,3	*			YES	**
DELTA TEMPERATURE (ΔT)	°F	2,3	5		5	YES	**
TEMPERATURE CAP							
JANUARY			50		50		
FEBRUARY			50		50		
MARCH			60		60		
APRIL			70		70		
MAY			80		80		**
JUNE	°F	2,3	87		87	YES	Previous permit had heat rejection limit only.
JULY			89		89		
AUGUST			89		89		
SEPTEMBER			87		87		
OCTOBER			78		78		
NOVEMBER			70		70		
DECEMBER			57		57		
TEMPERATURE MAX***							
JANUARY			53		53		
FEBRUARY			53		53		
MARCH			63		63		
APRIL			73		73		
MAY			83		83		**
JUNE	°F	2,3	90		90	YES	Previous permit had heat rejection limit only.
JULY			92		92		
AUGUST			92		92		
SEPTEMBER			90		90		
OCTOBER			81		81		
NOVEMBER			73		73		
DECEMBER			60		60		
TEMPERATURE PERCENT (%) DEVIATION	HOURS	2/3	*		*	YES	3 DAYS
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

** - Parameter was not established in the previous state operating permit.

*** - If a facility is in compliance with their Tcap limit, there is no need to calculate the Tcap (they would indicate No Flow).

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #007– DERIVATION AND DISCUSSION OF LIMITS:

- **Stream Flow.** Daily monitoring only requirement in cfs. It is the Department’s expectations that the permittee will obtain stream flow data from appropriate and applicable upstream USGS or COE (or both) Gauging Stations. If there is a significant distance from the facility to the nearest gauging station, it may be in the best interest of the permittee to fund a new gauging station; however, it is not required. Additionally, the Department will only use gauging station data as a viable source of stream flow. Meaning that flows (design or actual) from other point sources will not be considered (i.e., added to the flow determination). If the nearest gauging station is below the facility, then the permittee can use this data but must subtract their daily flow discharge from the receiving stream flow.
- **Temperature (Stream).** Daily monitoring only requirement in °F. For most facilities, the intake temperature can be used to determine stream’s temperature. However, in some cases, the ambient stream temperature can be used. The permittee will need to inform the Department that they may use the actual stream’s temperature.
- **Delta Temperature (ΔT).** The permittee shall not cause the temperature of the receiving stream to change by +/- 5°F, in accordance with [10 CSR 20-7.031(4)(D)1.]. ΔT is calculated as follows:

$$\Delta T = [(Q_s/4)T_s + Q_e T_e] / ((Q_s/4) + Q_e) - T_s$$

Where,

$Q_s/4$ = is the receiving stream flow in cfs divided by 4 in accordance with [10 CSR 20-7.031(4)(D)6.], 25% of the flow.

Q_e = Effluent Flow. For this facility it is the combined flow per day for both Outfall #001 and #002.

T_s = Receiving stream’s ambient temperature. A facility’s intake temperature can be used for this parameter if the facility believes that it is representative of the receiving stream’s actual temperature.

T_e = Temperature of the Effluent. For this facility it is the average of the temperatures from Outfall #001 and #002.

If the ΔT is greater than 5 °F, then the facility is in non-compliance. For additional description, please see **Appendix A – Temperature Limit Derivation Method.**

- **Temperature Cap (T_{cap}).** In accordance with 10 CSR 20-7.031(4)(D)5., this facility shall not exceed the monthly temperature criteria established for Zone C (also known as Zone 2) for the Mississippi River, as listed below:

Month	Zone C Criteria in °F	Month	Zone C Criteria in °F
January	50	July	89
February	50	August	89
March	60	September	87
April	70	October	78
May	80	November	70
June	87	December	57

T_{cap} is calculated as follows:

$$T_{cap} = [(Q_s/4)T_s + Q_e T_e] / ((Q_s/4) + Q_e)$$

Where,

$Q_s/4$ = is the receiving stream flow in cfs divided by 4 in accordance with [10 CSR 20-7.031(4)(D)6.], 25% of the flow.

Q_e = Effluent Flow. For this facility it is the combined flow per day for both Outfall #001 and #002.

T_s = Receiving stream’s ambient temperature. A facility’s intake temperature can be used for this parameter if the facility believes that it is representative of the receiving stream’s actual temperature.

T_e = Temperature of the Effluent. For this facility it is the average of the temperatures from Outfall #001 and #002.

For additional description, please see **Appendix A – Temperature Limit Derivation Method.**

- **Temperature Max (T_{max}).** In addition to the T_{cap} , 10 CSR 20-7.031(4)(D)5. also establishes that a facility may exceed their T_{cap} for a certain amount of time (please see **Percent Deviation Allowance** below). However, it can not exceed the T_{cap} by more than 3°F, which is considered the T_{max} . The T_{max} is the Zone C criteria + 3°F and can not be exceeded. T_{max} is calculated with the same method of T_{cap} , but is compared to Zone C criteria +3°F.

$$T_{max} = [(Q_s/4)T_s + Q_e T_e] / ((Q_s/4) + Q_e)$$

For additional description, please see **Appendix A – Temperature Limit Derivation Method.**

- **Percent Deviation Allowance.** In accordance with 10 CSR 20-7.031(4)(D)5, facilities in Zone 2 are allowed to exceed the Monthly Temperature Criteria one percent (1%) of the time in any given calendar year. To determine compliance with this regulation, a year (365 days) is multiplied by 24 to obtain the number of hours per year, which is 8,760 hours. In order to obtain 1% in hours, 8,760 is multiplied by 0.01, which is approximately 88 hours. This parameter will not be established in the Limitation table, but will be established as a Special Condition. .

For additional description, please see **Appendix A – Temperature Limit Derivation Method.**

**Outfall #003 – Ash Pond; and
 Outfall #004 – Boiler Slag Dewatering Pond.**

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW (EFFLUENT)	MGD	1	*		*	NO	
TOTAL SUSPENDED SOLIDS (INTAKE)	MG/L	9	*			YES	**
TOTAL SUSPENDED SOLIDS (NET)	MG/L	1	100		30	NO	100 / 30 MG/L
TOTAL SUSPENDED SOLIDS (GROSS)	MG/L	9	*			YES	**
pH	SU	1,2	6.5 – 9.0		6.5 – 9.0	YES	6.0 – 9.0
OIL & GREASE	MG/L	1,2	15		10	YES	20 / 15
\WHOLE EFFLUENT TOXICITY (WET) TEST	% Survival	11	Please see WET Test in the Derivation and Discussion Section below.				
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALLS #003 & #004 – DERIVATION AND DISCUSSION OF LIMITS:

Technology-based Effluent Limits (TBEL)

TBELs are compared to WQBEL below. Additionally, due to the fact that the ELG limits for Ash Ponds and Boiler Slag Dewatering are the same, the calculations TBEL are the same.

- **Total Suspended Solids (Intake, Net, & Gross).** Due to the fact that there are several sources with differing flows subject to different ELGs, effluent limitations for TSS will be established in concentration (mg/L) rather than mass (lb/day), in accordance with 40 CFR 423.12(b)(11). Additionally, TSS is to be reported as a net and/or gross limit in accordance with 40 CFR 122.45(g). Therefore, TSS limits are 100 mg/L as a Daily Maximum and 30 mg/L as a Monthly Average, in accordance with 40 CFR 423.12(b)(3) and (4). The following conditions apply to TSS limits for determining compliance with regards to credit for TSS from intake waters.

1. Only water withdrawn from the Mississippi River that is used for process (e.g., fly ash transport) water and discharged to the Mississippi River is to be used in calculating the net discharge of TSS. Credit for TSS from other sources of water (including rainwater) can not be used for credit.
2. Credit may be taken only to the extent necessary to meet effluent limits.

TSS (continued):

3. The maximum credit may not exceed the concentration in the intake water after any treatment of the intake water.
4. All measures for flow and TSS must be made the same day.

Net discharge is to be calculated as follows:

$$(Q_d \times 8.34 \times C_d) - (Q_r \times 8.34 \times C_r) / (Q_d \times 8.34) = \text{Net discharge in mg/L}$$

Where:

Q_d = Flow from Outfall #003 or #004 (in MGD);

C_d = Concentration of TSS measure in the final effluent from Outfall #003 or #004 in mg/L;

Q_r = Intake flow (in MGD) that flows to Outfall #003 or #004;

C_r = Intake flow TSS concentration.

When taking credit for TSS in the intake water, the permittee will be required to document all measurements and calculations used to determine the amount of the credit and shall report the gross and the net discharge of TSS on the discharge monitoring report; therefore TSS intake and gross are required to have monitoring conditions only. The TSS Net discharge shall never be less than 0 mg/L.

- **pH.** In accordance with 40 CFR 423.12(b)(1), pH shall be maintained in the range of 6.0 – 9.0.
- **Oil & Grease.** Due to the fact that there are several sources with differing flows subject to different ELGs, effluent limitations for TSS will be established in concentration (mg/L) rather than mass (lb/day), in accordance with 40 CFR 423.12(b)(11). 20 mg/L as a Daily Maximum and 15 mg/L as a Monthly Average in accordance with 40 CFR 423.12(b)(3) & (4).

MDL = 20 mg/L

AML = 15 mg/L

Water Quality-based Effluent Limit

TBELs are compared to WQBEL below.

- **Flow (Effluent).** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **pH.** In accordance with 10 CSR 20-7.031(4)(E), pH shall be maintained in the range of 6.5 – 9.0 pH SU, and pH is not to be averaged. DMRs for the past 5 years were reviewed and document that this facility can meet the new more protective limits with only one documented below 6.5 pH result. Therefore, pH limitation range will be applicable upon issuance of this operating permit.
- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum. DMRs for the past 5 years were reviewed and document that this facility can meet the new more protective limits. Therefore, O&G limits will be applicable upon issuance of this operating permit.
- **WET Test.** WET testing is to be conducted on Outfall #003 and not Outfall #004. This is due to the fact that the wastestreams for these outfalls are similar but with Outfall #003 having more potential for being more toxic. WET Testing schedules and intervals are established in accordance with the Department's Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.
 - Acute
 - No less than **ONCE/YEAR:**
 - Facility is designated as a Major facility or has a design flow ≥ 1.0 MGD.
 - Facility continuously or routinely exceeds their design flow.
 - Facility exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
 - Facility has Water Quality-based effluent limitations for toxic substances (other than NH₃).

$$\text{Acute AEC\%} = ((\text{design flow}_{\text{cfs}} + \text{ZID}_{7Q10}) / \text{design flow}_{\text{cfs}})^{-1} \times 100 = \#\%$$

$$\text{Acute AEC\%} = ((58.9_{\text{cfs}} + 2692) / 58.9)^{-1} \times 100 = 2.1\% \text{ rounded down to } 2\%$$

Therefore, the Dilution Series will be as follows:

8%, 4%, 2%, 1%, and 0.5%

Technology-based Effluent Limit versus Water Quality-based Effluent Limit

Limitations in bold signify they are more protective and will be established as a permit limit.

Pollutant	TBEL		WQBEL	
	Daily Maximum	Monthly Average	Daily Maximum	Monthly Average
TSS	100 mg/L	30 mg/L	N/A	N/A
pH	6.0 – 9.0	6.0 – 9.0	6.5 – 9.0	6.5 – 9.0
Oil & Grease	20	15	15	10

- **Minimum Sampling and Reporting Frequency Requirements.** Sampling and reporting frequency requirements have been retained from previous state operating permit.

Outfall #005 – Storm water run-off from facility’s grounds (non-coal)

DERIVATION AND DISCUSSION OF BENCHMARKS:

This operating permit will contain a SWPPP, BMPs, and Benchmarks in place of effluent limitations for stormwater run-off for Outfall #005. Pollutants established for this facility to be monitored for are TSS, pH, Settleable Solids, and Oil & Grease. The Benchmark levels (contained in the Benchmark Table below) are to be established in the operating permit to ensure Missouri’s Water Quality Standards will not be violated. The Benchmark levels below have been documented as attainable with sound SWPPP’s and BMP’s. Additionally, the permit will need to require a reporting regiment to ensure that Benchmarks are being attained; and if not, then to document that the permittee has taken steps to address the benchmark when storm water run-off water samples are above the below benchmarks.

Benchmarks Table

Parameter	Benchmark
Settable Solids	1.5 mL/L/hr
Total Suspended Solids	50 mg/L
pH – Units	6.5-9.0 Standard Units
Oil & Grease	10 mg/L

Part VI – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

PUBLIC NOTICE:

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- The Public Notice period for this operating permit was from December 17, 2010, to February 15, 2011. The extended Public Notice Period was granted based on 3rd party request to allow them to review the working permit file for this facility to ensure that a sound comment response could be given. During this period, the Water Protection Program received comment letters from the permittee and from Great River Environmental Law Center. Comments received did require that the draft operating permit be modified. Modification include (1) the removal of limits from the storm water outfall #005 and the establishment of Benchmarks in place of the limits; (2) corrections to some calculations; (3) minor error corrections; (4) additional requirements to groundwater monitoring due to Coal Ash Impoundments.

The modifications made to this operating permit do not constitute an additional Public Notice. The operating permit is to be issued.

DATE OF FACT SHEET: DECEMBER 8, 2010

REVISED: APRIL 8, 2011

COMPLETED BY:

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Part VII – Appendices

APPENDIX A – TEMPERATURE LIMIT DERIVATION METHODS

Temperature Limits Derivation **General & Limited Warm-Water Fisheries**

Introduction

Missouri's Water Quality Standards (WQS) establish Temperature Criteria that provide several forms of protection from the impacts of heat energy on receiving water bodies. The purpose of the Temperature Limit Guidance is to provide a simplistic approach to help both permit writers and the public understand Temperature Criteria and how they are applied in Missouri State Operating Permits.

Missouri's WQS Temperature Criteria [10 CSR 20-7.031(4)(D)] establish two (2) main areas of compliance for general and limited warm-water fisheries. The first compliance requirement deals with the rise of temperature in a stream, and the second compliance requirement deals with the overall stream's temperature not to exceed. Both compliance requirements are to be established beyond the regulatory mixing zone (if applicable). These two (2) compliance requirements are located in Missouri WQS [10 CSR 20-7.031(4)(D)1. & 5.].

Missouri WQS Temperature Criteria [10 CSR 20-7.031(4)(D)1.] contains both compliance requirements for all streams. However, the overall stream's temperature not to exceed in this specific regulation does not cover the Mississippi River. Missouri WQS Temperature Criteria for the Mississippi River is established in [10 CSR 20-7.031(4)(D)5.], which also establishes a Percent Deviation Allowance to the Mississippi River and a maximum temperature not to exceed.

In addition to establishing temperature limits in an operating permit, Missouri's WQS Temperature Criteria also establish Mixing Zone regulations contain in [10 CSR 20-7.031(4)(D)6.]. In comparison to Missouri's WQS Toxic Mixing Considerations that use low-flow considerations (i.e, 1Q10, 7Q10, & 30Q10), the Missouri WQS Temperature regulations require the Missouri Department of Natural Resources (Department) to establish a Thermal Mixing Zone limited to either 25% of the cross-sectional area or 25% volume of a river. Meaning that the Thermal Mixing Zone can only be established on a daily basis per [10 CSR 20-7.031(4)(D)6.], unless the facility conducts a biological survey performed in response to Section 316(a) of the federal Clean Water Act (or equivalent). For this guidance and operating permits, the Department has determined that the regulatory Mixing Zone (unless otherwise specified) is 25% of the volume of the receiving stream.

This approach assumes that the receiving water consumes 100% of the heat energy being discharged.

APPENDIX A (CONTINUED):

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APPENDIX A (CONTINUED):

A. COMPLIANCE DETERMINATION WITH $\Delta T^{\circ}F$

Missouri WQS Temperature Criteria [10 CSR 20-7.031(4)(D)1.] establishes that point sources discharging to streams in Missouri shall not raise the temperature of the receiving stream by +/- 5°F at the end of the regulatory Mixing Zone. In the determination of compliance with the temperature criteria of ΔT , several factors/conditions need to be obtained (i.e., intake temperature, stream flow, effluent flow, & effluent temperature).

The following calculation determines compliance with the +/- 5°F.

$$\Delta T = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)] - T_s$$

Where:

$Q_s/4$: is the daily receiving stream's mixing zone flow in cfs minus the Intake flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

ΔT : is the amount in T°F that the facility is causing the receiving stream's temperature to rise at the end of the regulatory mixing zone.

If the ΔT is greater than 5°F, then the facility is in non-compliance.

The term Q_s will be established in operating permits as Ambient Stream Flow in the unit of cfs. It is the Department's expectation that the permittee will obtain the Q_s data from appropriate and applicable the nearest upstream USGS or Corp. or Engineers (or both) Gauging Stations.

If there is a significant distance from the facility to the nearest upstream gauging station, it may be in the best interest of the permittee to fund a new gauging station; however, it is not required. Additionally, the Department will only use gauging station data as a viable source of receiving stream flow. Meaning that flows (design or actual) from other point sources will not be considered (i.e., added) to the flow determination.

If there is a near-by gauging station downstream of the facility, then the permittee can use this data but must subtract their daily effluent discharge from the receiving stream flow.

The term Q_e will be established in the operating permit as Flow and reported in the unit cfs. It is recommended that effluent flow be used; however, Intake flow can be used for this determination.

The term T_s will be established in the operating permit as Temperature (Stream) and reported in the unit °F. For most facilities, the intake temperature can be used to determine T_s . However, in some cases, ambient stream temperature can be used. The permittee only need inform the department that they may or may not use ambient stream temperature. Remember, that we are discussing compliance with the receiving stream's temperature and not their intake structure's water temperature.

The term T_e will be established in the operating permit as Temperature (Effluent) and reported in the unit °F. This is not a measurement of the change in temperature from the intake to the effluent, but as it sounds – the temperature of the effluent.

APPENDIX A (CONTINUED):

B. COMPLIANCE DETERMINATION WITH 90°F (TEMPERATURE CAP):

Missouri WQS Temperature Criteria [10 CSR 20-7.031(4)(D)1.] also establishes that point sources discharging to streams (other than the Mississippi River) shall not cause or contribute to the receiving stream in excess of 90°F. In order to determine compliance with the T_{cap} , the same equation used for ΔT compliance, with some modification, is used.

The following equation determines compliance with Temperature Cap Criteria of 90°F.

$$T_{cap} = [(Q_s/4)T_s + Q_e T_e] / [(Q_s/4) + Q_e]$$

Where:

$Q_s/4$: is the daily receiving stream's mixing zone flow in cfs minus the Intake flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

T_{cap} : is the temperature of the receiving stream at the end of the regulatory mixing zone.

If the T_{cap} is greater than 90°F, then the facility is in non-compliance.

The term Q_s will be established in operating permits as Ambient Stream Flow in the unit of cfs. It is the expectation of the Department that the permittee will obtain the Q_s data from appropriate and applicable the nearest upstream USGS or Corp. or Engineers (or both) Gauging Stations.

If there is a significant distance from the facility to the nearest upstream gauging station, it may be in the best interest of the permittee to fund a new gauging station; however, it is not required. Additionally, the Department will only use gauging station data as a viable source of receiving stream flow. Meaning that assumptions (e.g., other point sources) will not be considered as an added flow determination.

If there is a near-by gauging station downstream of the facility, then the permittee can use this data but must subtract their daily effluent discharge from the receiving stream flow.

The term Q_e will be established in the operating permit as Flow and reported in the unit cfs. It is recommended that effluent flow be used; however, Intake flow can be used for this determination.

The term T_s will be established in the operating permit as Temperature (Stream) and reported in the unit °F. For most facilities, the intake temperature can be used to determine T_s . However, in some cases, ambient stream temperature can be used. The permittee only need inform the department that they may or may not use ambient stream temperature. Remember, that we are discussing compliance with the receiving stream's temperature and not their intake structure.

The term T_e will be established in the operating permit as Temperature (Effluent) and reported in the unit °F. This is not a measurement of the change in temperature from the intake to the effluent, but as it is – the temperature of the effluent.

APPENDIX A (CONTINUED):

C. COMPLIANCE DETERMINATION WITH MISSISSIPPI RIVER TEMPERATURE CAP CRITERIA:

Missouri WQS Temperature Criteria [10 CSR 20-7.031(4)(D)5.] establishes that point sources discharging to the Mississippi River shall not cause or contribute to the receiving stream in excess of a Monthly Temperature Criteria. The methodology for the determination of compliance is similar to the T_{cap} for 90°F established above. However, the fundamental difference is the Monthly Temperature not to be exceeded. Thus the criteria is established per calendar month and per Mississippi River Zone, as follows:

Month	A & B		C	
	°F	°C	°F	°C
January	45	7 2/9	50	10
February	45	7 2/9	50	10
March	57	13 8/9	60	15 5/9
April	68	20	70	21 1/9
May	78	25 5/9	80	26 6/9
June	86	30	87	30 5/9
July	88	31 1/9	89	31 6/9
August	88	31 1/9	89	31 6/9
September	86	30	87	30 5/9
October	75	23 8/9	78	25 5/9
November	65	18 3/9	70	21 1/9
December	52	11 1/9	57	13 8/9

Zone A = Zone 1A: Des Moines River to Lock and Dam No. 25.

Zone B = Zone 1B: Lock and Dam No. 25 to Lock and Dam No. 26.

Zone C = Zone 2: Lock and Dam No. 26 to the Missouri-Arkansas state line.

In addition to the Monthly T_{cap} , [10 CSR 20-7.031(4)(D)5.] establishes a Percent Deviation Allowance. The Percent Deviation Allowance provides a specific amount of time (in hours) that a facility can be out-of-compliance with their Monthly T_{cap} . Finally, [10 CSR 20-7.031(4)(D)5.] establishes a Maximum T_{cap} (T_{max}) that is never to be exceeded. The $T_{max} = T_{cap} + 3°F$. Meaning that if a facility located in Zone C is discharging their cooling water during the month of January, their T_{cap} would be 50°F and their T_{max} would be 53°F as long as they had time available for deviation from their T_{cap} .

The following equation determines compliance with Monthly T_{cap} .

$$T_{cap} = [((Q_s/4)T_s + Q_e T_e)] / ((Q_s/4) + Q_e)]$$

Where:

$Q_s/4$: is the daily receiving stream's mixing zone flow in cfs minus the Intake flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

T_{max} : is the temperature of the receiving stream at the end of the regulatory mixing zone.

APPENDIX A (CONTINUED):

C. COMPLIANCE DETERMINATION WITH MISSISSIPPI RIVER TEMPERATURE CAP CRITERIA (CONTINUED):

The following equation determines compliance with Monthly T_{max} .

$$T_{max} = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)]$$

Where:

$Q_s/4$: is the daily receiving stream's mixing zone flow in cfs minus the Intake flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

T_{max} : is the temperature of the receiving stream at the end of the regulatory mixing zone.

If the T_{max} is greater than the Monthly Temperature Criteria, then the facility is in non-compliance and the "clock is ticking" with regards to Percent Deviation Allowance time.

The term Q_s will be established in operating permits as Ambient Stream Flow in the unit of cfs. It is the expectation of the Department that the permittee will obtain the Q_s data from appropriate and applicable the nearest upstream USGS or Corp. or Engineers (or both) Gauging Stations.

If there is a significant distance from the facility to the nearest upstream gauging station, it may be in the best interest of the permittee to fund a new gauging station; however, it is not required. Additionally, the Department will only use gauging station data as a viable source of receiving stream flow. Meaning that assumptions (e.g., other point sources) will not be considered as an added flow determination.

If there is a near-by gauging station downstream of the facility, then the permittee can use this data but must subtract their daily effluent discharge from the receiving stream flow.

The term Q_e will be established in the operating permit as Flow and reported in the unit cfs. It is recommended that effluent flow be used; however, Intake flow can be used for this determination.

The term T_s will be established in the operating permit as Temperature (Stream) and reported in the unit °F. For most facilities, the intake temperature can be used to determine T_s . However, in some cases, ambient stream temperature can be used. The permittee only need inform the department that they may or may not use ambient stream temperature. Remember, that we are discussing compliance with the receiving stream's temperature and not their intake structure.

The term T_e will be established in the operating permit as Temperature (Effluent) and reported in the unit °F. This is not a measurement of the change in temperature from the intake to the effluent, but as it is – the temperature of the effluent.

APPENDIX A (CONTINUED):

Percent Deviation Allowance

The site-specific criteria for the Mississippi River allows the permittee to exceed their applicable criteria either 1% of the year for Zone 1A and 2; and 5% of the year for Zone 1B. It has been determined that this percent exceedances allowance should be tracked in hours for a calendar year.

Zone 1A and 2 = 1% = $[(365)(24)(0.01)] = 87.6 \text{ hours} = 88 \text{ hours}$

Zone 2A = 5% = $[(365)(24)(0.05)] = 438 \text{ hours}$.

Tracking of time used for Percent Deviation Allowance, will be captured and tracked via a permit Special Condition. If the permittee's T_{cap} exceeds the Monthly Temperature Criteria but is below the T_{max} and there is available time in the Percent Deviation Allowance, then the facility is in compliance. However, if the facility exceeds their T_{cap} and does not have any time remaining on their Percent Deviation Allowance, then the facility is in non-compliance. Finally, if a facility exceeds T_{cap} & T_{max} , they are in non-compliance and the Percent Deviation Allowance "clock" is running during the time of the excursion.

For every episode that the permittee uses their available time, the operating permit shall require that the permittee submit the time with their DMR that they exceeded their T_{cap} . This is very important to put this into the permit because it has implications for tracking and data entry in MoCWIS.

APPENDIX A (CONTINUED):

D. ESTABLISHING IN AN OPERATING PERMIT FOR A 90°F FACILITY:

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 2 of 8	
					PERMIT NUMBER MO-xxxxxxx	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow (Effluent)	cfs	*			once/day	grab
Stream Flow (Note 1)	cfs	*			once/day	grab
Temperature (Stream) (Note 2)	°F	*			once/day	grab
Temperature (Effluent)	°F	*			once/day	grab
ΔT (Note 3)	°F	5°F		5°F	once/day	grab
T _{cap} (Note 4)	°F	90°F		90°F	once/day	grab

A. Effluent Limitations and Monitoring Requirements (continued)

* - Monitoring requirement only.

Note 1: Stream flow. Stream flow is the daily flow of the receiving stream – intake flow.

Note 2: Temperature (Intake). It is recommended that if the Intake structure does not adequately provide a temperature of the receiving stream, then the facility should use the receiving stream’s ambient temperature.

Note 3: $\Delta T = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)] - T_s$

Where:

Q_s/4: is the daily receiving stream’s mixing zone flow in cfs minus the Intake flow in cfs.

Q_e: is the effluent’s flow in cfs.

T_s: is the stream’s temperature (ambient/intake temperature).

T_e: is the effluent’s temperature.

ΔT: is the amount in T°F that the facility is causing the receiving stream’s temperature to rise at the end of the regulatory mixing zone.

Note 4: $T_{cap} = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)]$

Where:

Q_s/4: is the daily receiving stream’s mixing zone flow in cfs minus the Intake flow in cfs.

Q_e: is the effluent’s flow in cfs.

T_s: is the stream’s temperature (ambient/intake temperature).

T_e: is the effluent’s temperature.

T_{cap}: is the temperature of the receiving stream at the end of the regulatory mixing zone.

APPENDIX A (CONTINUED):

E. ESTABLISHING IN AN OPERATING PERMIT FOR A MISSISSIPPI RIVER FACILITY:

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 2 of 8	
					PERMIT NUMBER MO-xxxxxxx	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow (Effluent)	cfs	*			once/day	grab
Flow (Stream) (Note 1)	cfs	*			once/day	grab
Temperature (Stream) (Note 2)	°F	*			once/day	grab
Temperature (Effluent)	°F	*			once/day	grab
ΔT (Note 3)	°F	5°F		5°F	once/day	grab
T_{cap} (Note 4) (<i>assumes zone c</i>)	°F				once/day	grab
January		50		50		
February		50		50		
March		60		60		
April		70		70		
May		80		80		
June		87		87		
July		89		89		
August		89		89		
September		87		87		
October		78		78		
November		70		70		
December		57		57		
T_{max} (Note 5) (<i>assumes zone c</i>)	°F				once/day	grab
January		53		53		
February		53		53		
March		63		63		
April		73		73		
May		83		83		
June		90		90		
July		92		92		
August		92		92		
September		90		90		
October		81		81		
November		73		73		
December		60		60		

APPENDIX A (CONTINUED):

A. Effluent Limitations and Monitoring Requirements (continued)

* - Monitoring requirement only.

Note 1: Stream flow. Stream flow is the daily flow of the receiving stream – intake flow.

Note 2: Temperature (Stream). It is recommended that if the Intake structure does not adequately provide a temperature of the receiving stream, then the facility should use the receiving stream's ambient temperature.

Note 3: $\Delta T = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)] - T_s$

Where:

$Q_s/4$: is the daily receiving stream's mixing zone flow in cfs minus the Intake flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

ΔT : is the amount in T°F that the facility is causing the receiving stream's temperature to rise at the end of the regulatory mixing zone.

Note 4: $T_{cap} = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)]$

Where:

$Q_s/4$: Daily receiving stream's flow divided by 4 (Mixing Considerations) in cfs minus the Intake Flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

T_{cap} : is the temperature of the receiving stream at the end of the regulatory mixing zone.

- (a) If the T_{cap} calculated temperature value is less than the specific month's Daily Maximum or Monthly Average T_{cap} , the permittee is to report the calculated temperature value as T_{cap} .
- (b) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} limit, but is below the T_{max} and there is time available in Percent Deviation Allowance (**see Note 6**); then the permittee is to report in accordance with **Note 5** below.
- (c) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} limit but is below the T_{max} , but there is no time available in Percent Deviation Allowance (**see Note 6**); then the permittee is to report the calculated temperature value as T_{cap} .
- (d) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} and T_{max} ; then the permittee is to report in accordance with **Note 5**.

Note 5: $T_{max} = [((Q_s/4)T_s + Q_e T_e) / ((Q_s/4) + Q_e)]$

Where:

$Q_s/4$ = Daily receiving stream's flow divided by 4 (Mixing Consideration) in cfs minus the Intake flow in cfs.

Q_e : is the effluent's flow in cfs.

T_s : is the stream's temperature (ambient/intake temperature).

T_e : is the effluent's temperature.

- (a) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} limit, but is below the T_{max} and there is time available in Percent Deviation Allowance (**see Note 8**); then the permittee is to report the calculated temperature value as T_{max} .
- (b) If the T_{cap} calculated result is greater than the specific month's Daily Maximum and/or Monthly Average T_{cap} and T_{max} ; then the permittee is to report the calculated temperature value as T_{max} .

APPENDIX A (CONTINUED):

Note 6: Missouri's Water Quality Standards allows permittees to exceed their applicable criteria for 1% of the year in Zone 2A (or C) in the Mississippi River. Percent Deviation Allowance shall be tracked in hours per year (please see **Special Condition # – Percent Deviation Allowance**).

SPECIAL CONDITIONS:

1. Percent Deviation Allowance

Site-specific temperature criteria for the thermal discharges to the Mississippi River allow the permittee to exceed their applicable temperature criteria for 1% of the year for Zone 1A and 2. This facility discharges to Zone 2 of the Mississippi River. Therefore, the permittee is authorized to exceed their Temperature Cap effluent limitation for 88 hours in one (1) calendar year. However, the permittee is not authorized to exceed their Temperature Max limitation at any time.

- (e) The permittee shall document the time in hours to the nearest minute that their calculated temperature values exceeded a specific month's Daily Maximum T_{cap} effluent limit. This time is to be subtracted from 88 hours to the nearest minute.
- (f) The permittee shall submit an annual report on January 28th of each year that includes the number of hours that the facility exceeded their Temperature Cap effluent limits for each month during the previous calendar year.
- (g) If the permittee exceeds their maximum allowed Percent Deviation Allowance of 88 hours prior to the end of the calendar year, then the permittee shall submit a Maximum Percent Deviation Exceeded Report to the Southeast Regional Office within 15 days of notice.
- (h) Percent Deviation Allowance is not applicable to the permit parameter of Temperature Maximum.

THIS IS THE END OF APPENDIX A

APPENDIX B – TBEL DETERMINATION

The EPA in 2009 published the "Steam Electrical Power Generating Point Source Category: Final Detailed Study Report (2009 Final Report). The 2009 Final Report summarizes data collected and analyzed from the EPA to review discharges from steam electrical power generating industry and to determine whether the current effluent guidelines for this industry and to determine whether current Effluent Limit Guidelines (ELGs) for this industry should be revised. From the 2009 Final Report, it determined a need existed to update the current effluent regulations specific to Steam Electrical Power Generating Point Sources [40 CFR Part 423]. The 2009 Final Report also concluded that the last updated version of this 1982 regulation does not adequately address the pollutants being discharged and have not kept pace with changes that have occurred in the power industry.

The 2009 Final Report identified pollutants that are commonly associated with the power industry (i.e., Flue Gas Desulfurization [FGD] & Coal Combustion Residuals [CCR]). The 2009 Final Report does not address how to determine a Pollutant of Concern (POC), but (as stated above) determined a need for the EPA to revise the current ELG 40 CFR 423. The EPA expects to complete this rulemaking and promulgate revised effluent guidelines in late 2013.

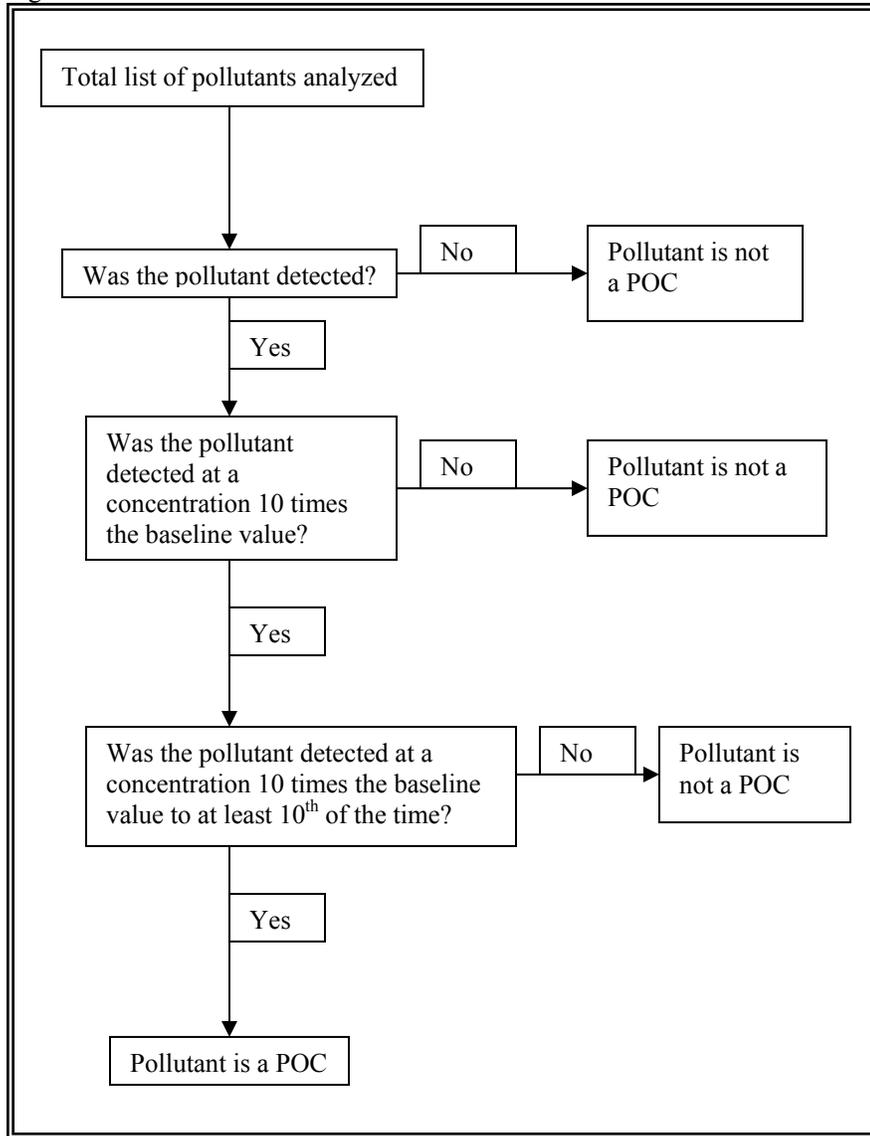
On June 7, 2010, the EPA's Office of Wastewater Management sent a memorandum with the purpose to provide interim guidance to assist permitting authorities to appropriately establish permit requirements for wastewater discharges from FGD systems and CCR impoundments at steam power plants. The 2010 EPA memo contained two (2) attachments: Appendix A – provided permitting authorities with information on how to establish TBELs for FGD; and Appendix B – was intended to assist permitting authorities to better address water quality impacts associated with discharges from coal ash impoundments. The 2010 EPA memo does not demonstrate how to determine if a pollutant needs to have TBEL limits.

Federal regulation 40 CFR Part 125.3(c) and 40 CFR Part 125.3(d) are the basis for establishing technology-based effluent limits and BPJ TBELs. To better understand these regulations, the EPA's Permit Writers Manual 5.2.3.2 discusses how to identify the need for case-by-case TBELs. In this section of the EPA Permit Writers Manual, it is the fourth bullet point that is specific to power plant industries with regard to the 2009 Final Report and the 2010 EPA memo. It states, "*When effluent guidelines are available for the industry category, but no effluent guidelines requirements are available for the pollutant of concern (e.g., a facility is regulated by the effluent guidelines for Pesticide Chemicals [Part 455] but discharges a pesticide that is not regulated by these effluent guidelines). The permit writer should make sure that the pollutant of concern is not already controlled by the effluent guideline and was not considered by the EPA when the Agency developed the effluent guideline.*"

Appendix B – TBEL Determination (continued):

In order to develop BPJ TBEL, POC should be determined first. The EPA Permit Writers Manual 5.2.1.2 informs staff to review the *Central Wastewater Treatment Category Technical Development Document*, Chapter 6, Figure 6-1 Pollutant of Concern Methodology (CWT Document). From the CWT Document, Figure 1 – How to Determine a POC has been created.

Figure 1 – How to Determine a POC



Baseline Values for the CWT Document are established in Chapter 15 of the same document. The baseline values for the potential POCs is located below. In accordance to Figure 1 and Chapter 6 of the CWT document, the baseline is multiplied by 10 prior to comparing with analyzed pollutants.

The below table documents the effluent samples from each of the applicable outfalls and the baseline values (x10) from Chapter 15. Outfalls #001, #004, #005 and #007 are not applicable to this review. Outfall #001 has the same process (once through cooling water) as Outfall #002. Often the cooling water is comingled in the cooling process. Outfall #004 is not applicable because it is comprised of the same makeup for Outfall #003. Outfall #005 is non-process storm water from this facility not related to any of the industrial process associated to the power plant industry. Finally, Outfall #007 is the combination of #001 and #002 and was created with the sole purpose of determining compliance with Missouri's Water Quality Standards Temperature Criteria.

Appendix B – TBEL Determination (continued):

Table 1

Pollutant	#002 mg/L	#003 mg/L	Baseline mg/L (x10)	Background mg/L
Aluminum	X	2.0	2.0	NR
Antimony	<0.02	<0.02	0.2	NR
Arsenic	<0.02	<0.02	0.1	NR
Boron	X	0.12	1.0	NR
Cadmium	<0.002	<0.002	0.05	NR
Chlorides**	X	X	10	NR
Chromium	<0.004	<0.004	0.1	NR
Cobalt	X	<0.005	0.5	NR
Copper	<0.01	<0.01	0.25	NR
Fluoride	X	0.62	1.0	NR
Iron	X	2.2	1.0	4.2***
Lead	<0.01	<0.01	0.5	NR
Manganese	X	0.089	0.15	NR
Mercury	<0.0002	<0.0002	0.002	NR
Molybdenum	X	<0.01	0.1	NR
Nickel	<0.01	<0.01	0.4	NR
Nitrogen*	X	X	0.5	NR
Phosphorus	X	X	10	NR
Selenium	<0.01	0.012	0.05	NR
Thallium	<0.01	<0.01	0.1	NR
Zinc	0.03	<0.01	0.2	NR

* = Nitrogen did not have a baseline, but nitrate/nitrite does

** = Total Residual Chlorine

*** = Background Total Iron was obtained from USGS Gauging Station Mississippi River at Thebes, IL., from 2001 to 2008.

X = believe absent – do not use

NR = Not required

Table 1 above clearly documents that the above pollutants do not meet the initial determination of being POCs. Table 1 does; however, document that Total Iron is approximately twice the Baseline value (x10); however, it is staff’s BPJ that this result is from intake water used for sluicing fly ash to the Coal Ash Impoundments utilized by the facility as documented with the 4.2 mg/l background level of Total Iron.

Therefore, it is staff’s BPJ that effluent from this facility does not contain pollutants in levels to trigger (1) additional monitoring, and (2) Technology-based Effluent Limitations.