Permit No. CP0002539

# STATE OF MISSOURI

## DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

## CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

BLACK & VEATCH CONSTRUCTION, INC.
AECI – Turney Energy Center
3439 NE 288th St.
Turney, MO 64465

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (department).

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

September 18, 2025
Effective Date

September 17, 2027
Expiration Date

**Heather Peters, Director, Water Protection Program**

# CONSTRUCTION PERMIT

## I. CONSTRUCTION DESCRIPTION

Construction of a detention basin to serve AECI-Turney Energy Center, a new natural gas peaking power plant. The detention basin is to receive process wastewater from the power plant and stormwater runoff from the site. The detention basin will be a single rectangular cell approximately 1.2 acres, with a depth of 7.4 feet from the spillway; volume at spillway elevation is approximately 2.275 million gallons; liner to be 60 mil. HDPE. The detention basin will equalize discharges with weirs and orifices; flows can be controlled with valves but basin has the ability to drain completely (dry) by gravity.

This project will also include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make a complete and usable wastewater and stormwater control facility to serve a flow of 200,000 gallons per day (gpd). Flows are highly dependent on use of facility and precipitation. Process wastewater is primarily reject water from reverse osmosis and demineralization of drinking water from public water supply district; and evaporative cooler blowdown water. Discharge is to a Tributary to Little Platte River in Sec. 2, T55N, R31W, Clinton County.

## II. COST ANALYSIS FOR COMPLIANCE

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a "finding of affordability" on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

The department is not required to complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

## III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.

2. All construction shall be consistent with plans and specifications signed and sealed by Leslie Cerny-Robben, P.E. with Black & Veatch and as described in this permit.

3. The department must be contacted in writing prior to making any changes to the plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's Kansas City Regional Office per 10 CSR 20-7.015(9)(G).

5. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at https://dnr.mo.gov/data-e-services/missouri-gateway-environmental-management-mogem. See https://dnr.mo.gov/data-e-services/water/electronic-permitting-epermitting for more information.

6. A United States Army Corps of Engineers (USACE) Clean Water Act Section 404 Department of the Army permit and a Section 401 Water Quality Certification issued by the department may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied or notification is provided that no Section 404 permit is required by the USACE. You must contact your local USACE district since they determine what waters are jurisdictional and which permitting requirements may apply. You may call the department's Water Protection Program, Operating Permits Section at 573-522-4502 for more information. See https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/section-401-water-quality for more information.

7. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.

    - Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the 100- year flood elevation. 10 CSR 20-8.140(2)(B)
    - Unless another distance is determined by the Missouri Geological Survey or by the department's Public Drinking Water Branch, the minimum distance between wastewater treatment facilities and all potable water sources shall be at least 300 feet. 10 CSR 20-8.140(2)(C)1.

- Facilities shall be readily accessible by authorized personnel from a public right–of-way at all times. 10 CSR 20-8.140(2)(D)
- All sampling points shall be designed so that a representative and discrete 24 hour automatic composite sample or grab sample of the effluent discharge can be obtained at a point after the final treatment process and before discharge to or mixing with the receiving waters. 10 CSR 20-8.140(6)(B).
- All outfalls shall be posted with a permanent sign indicating the outfall number (i.e., Outfall #001). 10 CSR 20-8.140(6)(C).
- No piping or other connections shall exist in any part of the wastewater treatment facility that might cause the contamination of a potable water supply. 10 CSR 20-8.140(7)(D)1.
- Lagoon berms shall be constructed of relatively impervious material and compacted to at least 95% maximum dry density test method to form a stable structure. 10 CSR 20-8.200(5)(A)1.
- The minimum berm width shall be eight feet to permit access of maintenance vehicles. 10 CSR 20-8.200(5)(A)2.
- Minimum freeboard shall be two feet. 10 CSR 20-8.200(5)(A)3.
- An emergency spillway shall be provided that—
  - Prevents the overtopping and cutting of berms; 10 CSR 20-8.200(5)(A)4.A.
  - Is compacted and vegetated or otherwise constructed to prevent erosion; 10 CSR 20-8.200(5)(A)4.B. and
  - Has the ability for a representative sample to be collected, if discharging. 10 CSR 20-8.200(5)(A)4.C.
- The soil of the lagoon bottom shall be compacted with the moisture content between 2% below and 4% above the optimum water content and compacted to at least 95% maximum dry density test method. 10 CSR 20-8.200(5)(B)
- Synthetic seals thickness may vary due to liner material but the liner thickness shall be no less than 0.02” or 20 mil and be the appropriate material to perform under existing conditions. 10 CSR 20-8.200(5)(C)3.
- Seep collars shall be provided on drainpipes where they pass through the lagoon seal. 10 CSR 20-8.200(5)(C)4.

8. Upon completion of construction:

   A. ASSOCIATED ELECTRIC COOPERATIVE, INC. (AECI) will become the continuing authority for operation and maintenance of these facilities;

   B. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications; and

C. Submit the Statement of Work Completed form to the department in accordance with 10 CSR 20-6.010(5)(N) (https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155) and request the operating permit modification public noticed on August 8, 2025, be issued.

## IV. REVIEW SUMMARY

### 1. CONSTRUCTION PURPOSE

A new peaking power generation facility is being installed. A natural gas simple-cycle combustion turbine with a generating capacity of 420-445 MW. The detention basin will serve to equalize all process water flow from the power generation facility and also stormwater from the site.

### 2. FACILITY DESCRIPTION

This is a new industrial facility. Process wastewater consists of reverse osmosis (RO) reject water; electro-deionization reject water, evaporative cooler blowdown water, and floor drains from inside buildings. Storm water is from the facility grounds including secondary containment structures. Wastewater treatment will consist of an oil-water separator and a large detention basin where process water and stormwater will comingle. Basin will have a maximum volume of approximately 2.275 million gallons at the spillway elevation. The generator is expected to operate only during peak energy demand times; generally during exceptionally hot or exceptionally cold periods.

Potable water is from Consolidated Public Water Supply District No. 4 of Clinton, Caldwell, Ray, and Clay Counties.

Domestic waste flows from facility are less than 3,000 gpd and to be disposed in an on-site soil absorption system under jurisdiction of Clinton County.

The AECI – Turney Energy Center is located at NE Breckenridge Rd. and NE 288th Street, Turney, in Clinton County, Missouri. The facility has a design average flow of 200,000 gpd. Outfall location: UTM Coordinates X = 384326, Y = 4385384

## 3. COMPLIANCE PARAMETERS

The limits following the completion of construction will be applicable to the facility:

| Parameter | Units | Monthly average limit |
|---|---|---|
| Total Residual Chlorine | µg/L | 9 (50 ML) |
| Oil & Grease | mg/L | 10 |
| pH | SU | 6.5-9.0 |
| Total Suspended Solids | mg/L | 30 |
| Chloride | mg/L | 188.3 |
| Chlorides + Sulfates | mg/L | 498.5 |

## 4. ANTIDEGRADATION

The department has reviewed the antidegradation report for this facility and issued the Water Quality and Antidegradation Review dated May 20, 2025, due to a new discharge. See **APPENDIX A– ANTIDEGRADATION ANALYSIS** .

## 5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Detention Basin – flow enters basin by gravity sewers. The basin is rectangular with an area of approximately 54,709 square feet (sq. ft.) at top of berms, area near bottom is approximately 39,000 sq. ft. but basin slopes and funnels to the outlet structure. The total depth is 8.06 feet, with a 3:1 inner-berm side slope. The basin seal is a HDPE synthetic liner with a thickness of 60 mil. The surface area at spillway elevation is approximately 53,276 sq. ft. with a depth of 7.42 ft., the volume at spillway elevation is approximately 2.275 million gallons. The spillway is 14 ft. wide and 0.66 ft. deep. Pond outfall structure is built inside of basin with flow limiting orifices and weirs at various specific elevations; a slide gate valve on outfall pipe will also control flow; basin is designed to empty completely and be operated as a dry detention basin; approximately 103 ft. of 30-inch CHDPE outfall pipe to discharge structure (outfall #001).

The detention basin and outfall structure are sized to attenuate a 10 year, 24-hr storm to predevelopment discharge conditions. It also has the capacity to pass the 24-hr 100 year storm event.

Flows vary based on demand, time of year, and weather events. The design is based on peak process water flows up to 77 gallons per minute (gpm) (110,880 gpd) operation plus stormwater events for a total daily design flow of 200,000 gpd.

## 6. OPERATING PERMIT

Operating Permit MO-0140937 was successfully public noticed from August 8, 2025, to September 8, 2025, with no comments received. After completion of construction project submit: statement of work completed, as-builts if the project was not constructed in accordance with previously submitted plans and specifications, and ensure that the initial annual fee of $1800.00 has been submitted. Missouri State Operating Permit, MO-0140937, will be issued after receipt of the above documents.

## V. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

Andrew Appelbaum, P.E.
Engineering Section
andy.appelbaum@dnr.mo.gov

## APPENDICES

- **Antidegradation Analysis**
- **Map of Discharge Location & Process Flow Diagram**

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Mike Kehoe
Governor

Kurt U. Schaefer
Director

**OFFICIAL COPY VIA EMAIL: jjones@aeci.org**

May 20, 2025

Jenny Jones
P.O. Box 754
Springfield, MO 65801

RE: Direct Discharge to Presumed Use Stream – AECI Turney Energy Center, MONEW, Water Quality and Antidegradation Review Preliminary Determination, ACT1723, Clinton County

Dear Jenny Jones:

Enclosed please find the finalized Water Quality and Antidegradation Review (WQAR) for the *Antidegradation Review for Associated Electric Cooperative, Inc Turney Energy Center* received on January 14, 2025. The WQAR contains pertinent antidegradation review information for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Implementation Procedure* (AIP) dated July 13, 2016, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources' (department's) initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

The WQAR identifies the establishment of Outfall #001, discharging to a Presumed Use Stream with a lagoon-based treatment system as the preferred alternative. Table 2-1 limits are applicable to the proposed facility, with the receiving stream being classified as gaining based on the 2025 Geohydrologic Evaluation. The proposed discharge will have a design average flow of 0.2 million gallons per day (MGD).

Following the department's public notice of a draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and determinations will be considered final.

Following issuance of the construction permit and completion of the actual facility construction, the department will proceed with the issuance of the operating permit.

If you should have questions regarding the enclosed WQAR, please contact the Engineering Section by telephone at 573-751-1599, by e-mail at DNR.WPPEngineerSection@dnr.mo.gov, or by mail at the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM

Cindy LePage

Cindy LePage, P.E., Chief
Engineering Section

CL:lmj

MISSOURI DEPARTMENT OF NATURAL RESOURCES

**Water Protection Program**
**Water Pollution Control Branch**
**Engineering Section**

# Water Quality and Antidegradation Review

For the Protection of Water Quality
and Performance Based Discharge Level Determination for

Tributary to Presumed Use Stream to Little Platte River

Requested by
Sarah Eastin
Black & Veatch

For
AECI Turney Energy Center
Associated Electric Cooperative Inc.

May 2025

TABLE OF CONTENTS

## PURPOSE OF ANTIDEGRADATION REVIEW REPORT

An Antidegradation Review Request was submitted by Sarah Eastin with Black & Veatch for Associated Electric Cooperative, Inc. (AECI) for the AECI- Turney Energy Center to evaluate construction of a wastewater treatment facility to serve the proposed Turney Energy Center and designed to treat 200,000 gallons per day (gpd) of process wastewater and incidental stormwater. Flows vary based on demand, time of year, and weather events. Design is based on peak process water flows for a total daily design flow of 200,000 gpd.

In accordance with Missouri's Water Quality Standards [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the department developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review that documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, and revised July 13, 2016, a facility is required to use Missouri's Antidegradation Implementation Procedure (AIP) for new and expanded wastewater discharges.

The AIP specifies that when the proposed activity results in a reduction by 10% or more of the:

- facility assimilative capacity for any pollutant as a result of any single discharge;
- segment assimilative capacity for any pollutant as a result of all discharges combined after existing water quality (EWQ); or
- any new or expanded discharge that the department determines will likely result in the increased accumulation of pollutants or their degradation products in sediment or fish tissue,

then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required.

The applicant elected to determine that all pollutants of concern (POC) require a demonstration of necessity and a determination of social and economic importance in the absence of existing water quality data for the receiving stream. An alternatives analysis was conducted to fulfill the requirements of the Antidegradation Implementation Policy (AIP).

The preferred treatment technology is a lagoon-based system with an oil/water separator to handle the demineralization tank reject water and stormwater inputs. As a peaking facility, wastewater will not be generated daily, as the system will only operate during peak demand times, typically a few days to a couple of weeks at a time each summer and winter. The system operates as a peak flow system with potable water supplied by Consolidated Water Supply District #4. The receiving waterbody is tributary to Presumed Use Stream to Little Platte River. The proposed discharge is approximately 2.8 miles upstream of the Little Platte River. The proposed design flow is 200,000 gpd.

The following is a review of the *Wastewater Treatment Facility Antidegradation Review Report* for AECI Turney Energy Center prepared by Sarah Eastin of Black and Veatch dated January 14, 2025, with additional information supplied on March 24, 2025, by Keslie Inman of AECI.

## PERMIT LIMITS AND MONITORING INFORMATION

Domestic wastewater will be handled with an onsite system approved through the Clinton County Health Department. This Antidegradation is for process wastewater flows and stormwater flows from the site.

**Table 0-1: Performance Based Limits**

| PARAMETER | Unit | Basis | Daily Maximum | Monthly Average |
|---|---|---|---|---|
| Flow | MGD | FSR | - | * |
| TSS | mg/L | FSR/ PBEL | 100 | 30 |
| Copper, Total Recoverable | µg/L | WQBEL | * | * |
| Chloride | mg/L | WQBEL/PBL | 377.8 | 188.3 |
| Sulfate | mg/L | WQBEL/PBL | * | * |
| Chlorides+Sulfate | mg/L | WQBEL/PBL | 1,000 | 498.5 |
| Oil & Grease | mg/L | FSR/PBL | 15 | 10 |
| Chlorine, Total Residual | µg/L | WQBEL/PBL | 18<br><50 | 9<br><50 |
| Total Kjeldahl Nitrogen | mg/L | FSR | * | * |
| Ammonia as N | mg/L | FSR | * | * |
| Nitrite+Nitrate | mg/L | FSR | * | * |
| Nitrogen, Total | mg/L | FSR | * | * |
| Total Phosphorus | mg/L | FSR | * | * |
| PARAMETER | Unit | Basis for Limits | | Minimum/ Maximum |
| pH | SU | FSR/PBEL | - | 6.5-9.0 |

* - Monitoring requirement only

**Basis for Limitations Codes**:

TBEL – Technology-Based Effluent Limit
WQBEL – Water Quality-Based Effluent Limit
PBL – Performance Based Limit
FSR – Federal or State Regulation
BPJ – Best Professional Judgment

## FACILITY INFORMATION

AECI is proposing to construct a 420-445 MW simple cycle gas turbine peaking facility to provide power when needed, typically to serve sudden surges in electricity use. The proposed Turney Energy Center will be supplied with natural gas from the Rocky Mountain Express gas pipeline. Potable water to the site will be provided through a 1.5 mile 6-inch HDPE pipeline from Consolidated Public Water Supply District #4.

Peaking facilities reliably serve members during periods of peak energy use. Seasonal peak energy use typically occurs during very hot or very cold weather, while daily peaks tend to occur early in the morning and evening hours when people are at home and using larger appliances. The proposed energy center will have quick-start capability to meet fluctuating energy demand, needing just 13 minutes to reach full capacity. While the main fuel will be natural gas, the facility will have the ability to burn fuel oil as well.

When considering potential locations for this energy center, proximity to natural gas supply lines and the cooperative's high-voltage transmission lines are key. This site, located two miles southwest of Turney, best meets those requirements to construct the energy center at the lowest-cost possible to members.

| | |
|---|---|
| Facility Name: | AECI- Turney Energy Center |
| Address: | NE Breckenridge Rd and NE 288th Street, Turney, MO |
| Permit #: | New site specific, MO-new |
| County: | Clinton |
| Facility Type: | Industrial: Major, Primary |
| Owner & Continuing Authority: | Associated Electric Cooperative, Inc. (AECI) |
| Sec. of State Charter No: | Q00101340 |
| UTM Coordinates: | X = 384326; Y = 4385384 |
| Legal Description: | Sec.2 , T55N, R31W |
| 12-digit watershed: | 10240012-0703 Grindstone Creek-Little |
| Ecological Drainage Unit: | Central Plains/Nishnabotna/Platte |
| EcoRegion: | Central Irregular Plains |

**A. Facility Performance History:**

There is no performance history for this facility since it is a new and proposed discharging facility.

**B. Natural Heritage Review**

A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant. Records of state-listed (not federal-listed) endangered species AND / OR state-ranked (not state-listed endangered) species and natural communities of conservation concern, were identified in the area- the American badger and the easter tiger salamander. Two species of bats, Indiana and Northern Long-Eared, may be present in the project area. The following recommendations were made for construction activities:

- Manage construction to minimize sedimentation and run-off to nearby streams.
- At stream and drainage crossings, avoid erosion, silt introduction, petroleum or chemical pollution, and disruption or realignment of stream banks and beds.
- If any trees need to be removed for the project, contact the U.S. Fish and Wildlife Service for coordination under the Endangered Species Act.

**C. Geohydrologic Evaluation**

A Geohydrologic Evaluation was submitted with the request and the receiving stream is gaining for discharge purposes (see Appendix B). The site is located on hillslope approximately half a mile east of Breckenridge Road and 2 miles southwest of the city of Turney. Surface water runoff from the site drains southeast towards a tributary to Little Platte River. Surficial materials on-site were identified with a handheld auger and observed in the bank of the tributary to Little Platte River. Surficial materials consist of glacial till, including low to moderately permeable brown silt loam and silty clay, and silty clay loam. According to local well logs, glacial drift materials are approximately 60 to 115 feet thick. There are no known springs, sinkholes, or geologic features within one mile of the proposed site or the receiving stream.

**RECEIVING WATERBODY INFORMATION**

**Receiving Waterbody**

**Table 0-2: Outfall Table**

| OUTFALL | DESIGN FLOW (CFS) | TREATMENT LEVEL | EFFLUENT TYPE |
|---|---|---|---|
| 001 | 0.31 | Settling | Industrial plus stormwater |

**Table 0-3: Receiving Stream(s)**

| WATER-BODY NAME | CLASS | WBID | DESIGNATED USES* | 12-DIGIT HUC | DISTANCE TO CLASSIFIED SEGMENT (MI) |
|---|---|---|---|---|---|
| Tributary to Presumed Use Stream | - | - | General Criteria | 10240012-0703 | 0.10 |
| Presumed Use Stream [Tributary to Little Platte River] | C | 5043 | AHP-WWH, WBC-B, SCR, HHP, IRR, LWP | | |
| Little Platte River | C | 352 | AHP-WWH, WBC-A, SCR, HHP, IRR, LWP | | 3.26 |

* **AHP** = Aquatic Habitat Protection - To ensure the protection and propagation of fish, shellfish, and wildlife. AHP is further subcategorized as: **WWH** = Warm Water Habitat; **CLH** = Cool Water Habitat; **CDH**= Cold Water Habitat; **EAH** = Ephemeral Aquatic Habitat; **MAH** = Modified Aquatic Habitat; **LAH** = Limited Aquatic Habitat; **DWS** = Drinking water supply; **GRW** = Groundwater; **HHP** = Human Health Protection as it relates to the consumption of fish; **IND** = Industrial water supply; **IRR** = Irrigation - Application of water to cropland or directly to cultivated plants that may be used for human or livestock consumption; **LWP =** Livestock and wildlife protection - Maintenance of conditions in waters to support health in livestock and wildlife; **WBC** = Whole Body Contact recreation where the entire body is capable of being submerged. WBC is further subcategorized as: **WBC-A** = Whole body contact recreation that supports swimming uses and has public access; **WBC-B** = Whole body contact recreation that supports swimming; **SCR** = Secondary Contact Recreation (like fishing, wading, and boating).

**Table 0-4: Receiving Stream Segments**

| Receiving Water Body Segment Outfall #1: | | |
|---|---|---|
| Upper end segment* UTM coordinates: | X = 384326; Y = 4385384 | Outfall |
| Lower end segment* UTM coordinates: | X = 384355; Y = 4385303 | downstream confluence with the Presumed Use Stream |

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

**A. Mixing Considerations and Low Flow Values**

The proposed first classified waterbody is a Presumed Use Stream, which is a class C stream. No mixing considerations were provided for the discharge.

**B. Mixing Considerations**

Mixing Zone: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(b)].

**C. Existing Water Quality**

No existing water quality data was submitted.

**D. Receiving Water Monitoring Requirements**

No receiving water monitoring requirements recommended at this time.

## ANTIDEGRADATION REVIEW INFORMATION

### A. Tier Determination

Waterbodies are assigned Tier 1, 2, or 3 protection levels.

Tier 1 protection is applied to a waterbody on a pollutant by pollutant basis for pollutants which may cause or contribute to the impairment of a beneficial use or violation of Water Quality Criteria (WQC); and prohibit further degradation of Existing Water Quality (EWQ) where additional pollutants of concern (POCs) would result in the water being included on the 303(d) List. According to the AIP, the waters may receive the POCs that are causing impairments if 1) the discharge would not cause or contribute to a violation of the WQS, 2) all other conditions of the state permitting requirements are met (i.e., no discharge options are explored and technology based requirements (including ELGs) are met); and 3) the permit is issued with the highest statutory and regulatory requirements.

- As this proposed discharge is located in Clinton County discharging to a Presumed Use Stream that is a tributary to Little Platte River, the receiving waterbody is not on the 2022 303(d) list for impairments or the 2022 305(b) list. There is no TMDL for the Presumed Use Stream or Little Platte River.

Tier 2 level protection is assigned to the waterbody on a pollutant-by-pollutant basis that prohibits the degradation of water quality of a surface water unless a review of reasonable alternatives and social and economic considerations justifies the degradation in accordance with the methods presented in the AIP.

- Tier 2 Pollutants for this review include: total suspended solids, pH, total residual chlorine, chlorides, sulfates, total nitrogen, oil and grease, total phosphorus, and copper.

Tier 3 protection prohibits any degradation of water quality of Outstanding National Resource Waters and Outstanding State Resource Waters as identified in Tables D and E of the Water Quality Standards (WQS). Temporary degradation of water receiving Tier 3 protection may be allowed by the department on a case-by-case basis as explained in Section VI of the AIP.

- As this proposed discharge is located in Clinton County discharging to a Tributary to Little Platte River, the receiving waterbody is not an Outstanding National Resource Water or an Outstanding State Resource Water, and as such Tier 3 is not applicable.

Below is a list of POCs reasonably expected and identified by the permittee in their application to be in the discharge. Pollutants of concern are defined as those pollutants "proposed for discharge that affect beneficial use(s) in waters of the state." They include pollutants that "create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge" (AIP, Page 6).

Domestic wastewater will be handled with an onsite system approved through the Clinton County Health Department.

**Table 0-5: Pollutants of Concern and Tier Determinations**

| Pollutant of Concern | Tier | Review Type | Comment |
|---|---|---|---|
| Total Suspended Solids | ** | Alternatives Analysis | |
| Copper, Total Recoverable | 2* | Alternatives Analysis | Potential from source water |
| Chloride | 2* | Alternatives Analysis | |
| Sulfate | 2* | Alternatives Analysis | |
| Chlorides+Sulfate | 2* | Alternatives Analysis | |
| Oil & Grease | 2* | Alternatives Analysis | |
| Chlorine, Total Residual | 2* | Alternatives Analysis | |
| Total Kjeldahl Nitrogen | 2* | Alternatives Analysis | |
| Ammonia as N | 2* | Alternatives Analysis | 10 CSR 20-7.015(9)(D)8 applied |
| Nitrite+Nitrate | 2* | Alternatives Analysis | 10 CSR 20-7.015(9)(D)8 applied |
| Nitrogen, Total | 2* | Alternatives Analysis | 10 CSR 20-7.015(9)(D)8 applied |
| Total Phosphorus | 2* | Alternatives Analysis | 10 CSR 20-7.015(9)(D)8 applied |
| pH | 2* | Alternatives Analysis | 10 CSR 20-7.0.31(5)(E) applied |

* Tier assumed.
** Tier determination not possible: No in-stream standards for these parameters.
*** Standards for these parameters are ranges.

**B. Necessity of Degradation**

The AIP specifies that if the proposed activity does result in a reduction by 10% or more of the assimilative capacity then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Part of that analysis as shown below is the evaluation of non-degrading alternatives, such as regionalization or no discharge systems.

The applicant has the option of assuming discharge will result in a reduction by 10% or more of the assimilative capacity and proceeding directly to the alternatives analysis, thereby avoiding the determination of the assimilative capacity of the receiving water. The applicant has elected this option.

**Regionalization**

The proposed Turney Energy Center is located in rural Clinton County and there is not a permitted facility nearby with the ability to handle flows generated by the power plant. Costs for connection were not provided due to the distances and the limited capacity of existing treatment plants. The closest permitted facilities are:

- City of Lathrop, MO-0112704, which is approximately 5.50 miles away, down NE A Hwy with a design average flow of 290,400 gpd.
- City of Plattsburg, MO-0030805, which is approximately 11 miles away with a design average flow of 268,000 gpd.
- City of Cameron, MO0104299, which is approximately 15 miles away with a design average flow of 1.60 MGD. While Cameron theoretically has capacity available, the distance to connect plus the requirement to cross Hwy 35 makes it infeasible.

**No Discharge Evaluation**

The proposed Turney Energy Center is surrounded by farmland, however with the proposed flows of 200,000 gpd when operating, the facility would need approximately 73 acres of land. Being located in Clinton County, the facility would be required to store water for 120 days, which is approximately 24 MG. From the University of Missouri, the 2024 irrigated farmland costs in Clinton County averages $11,037 per acre (https://extension.missouri.edu/publications/g401). Estimated land costs alone would be $805,711, not including the infrastructure for establishing an irrigation system.

Additionally, the facility would be subject to the new statute, 644.044, RSMo as an industrial facility, requiring the facility to develop a land application management plan. As nutrients are not a main pollutant of concern at the facility, there would be limited benefits for land application of generated wastewater at the facility.

Other no-discharge alternatives considered were evaporative ponds or reuse and recycling. An evaporative pond is not a feasible option as Missouri is a precipitation positive state in most years, thus precipitation exceeds evaporation, and rainwater would accumulate within the pond. Recycle or reuse is not a feasible alternative in some locations, but for simple cycle plants, this would require significant infrastructure and the need for high quality feed water makes it not a feasible option. Reuse of water for dust suppression is not needed at this site.

**Alternatives to No discharge**

**Alternative #1: Base Case**

The base case alternative is to have the municipal potable water initially flow into the Service Water Tank. A demineralization system including a 2-pass reverse osmosis (RO) and electro-deionization system (EDI) is used to remove dissolved solids and produce demineralized water. This water is stored in the Demin Water Tank.

The demineralization (demin) system will produce a waste stream with the rejected dissolved solids. It is estimated based on the water quality the demin system will operate at approximately 63% overall recovery, meaning that 37% of the influent flow is sent to waste. This is one of the sources of process wastewater.

An evaporative cooler is used to provide air cooling to equipment onsite based on ambient temperatures and humidity conditions. This evaporative cooler is supplied a blend of service water and demin water to meet water quality requirements for the evaporative cooler. To maximize water usage onsite, the evaporative cooler cycles the water until a certain conductivity is reached, and then a blowdown sequence is completed to discharge a waste volume. This is a second source of process wastewater.

Service water is used at various locations throughout the site and primarily would include water drained from piping or equipment during routine maintenance. Because of the potential for oil from equipment, these drains are all sent to an oil water separator which reduces any oil in the service water prior to discharge. This is the third source of process wastewater. These three discharges are collected and are collectively referred to as the process wastewater and are sent to the process stormwater pond. Because the demin trailer volume is the majority of the waste, the overall waste only concentrates. See Appendix A for proposed process flow diagram. The estimated cost is $1.5 million for the construction of the settling basin.

**Alternative #2: Zero Liquid Discharge**

Constructing the Turney Energy Center as a zero liquid discharge would require additional staffing for operations, long-term operation and maintenance costs, and would involve significant upgrades to the plant (heat source and power to the system). Zero liquid discharges involve advanced treatment, reuse, recycling, and reuse to prevent remove liquids and leave concentrated solids. Additionally, the climate of Missouri, is not conducive to an efficient, cost-effective, and reliable zero liquid discharge system. High humidity, high precipitation, and highly variable seasonal temperatures would negate the zero liquid discharge effectiveness and cause high reliability risk. Since Turney Energy Center is a peaking plant to provide reliability to the power grid, this is not a feasible option for AECI. At other peaking facilities, the estimated costs for zero liquid discharge treatment systems exceeded $20 million.

**C. Stormwater Contributions**

The facility is proposing to add stormwater in with the process wastewater from the site. As a simple cycle system, stormwater is not identified as a categorical industrial. However, as it was identified as contributing

to the discharge, the facility will need to select, install, use, operate and maintain Best Management Practices (BMPs), which will be described in the operating permit. The BMPs selected must be the most reasonable and effective management strategy for the site, while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The minimum BMPS are:

a) Provide good housekeeping practices on the site to keep trash from entry into waters of the state. It is expected onsite dumpsters are closed when not in use.
b) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, warehouse activities, and other areas, to prevent the contamination of stormwater from these substances.
c) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
d) Ensure adequate provisions are provided to prevent surface water intrusion into the wastewater storage wastewater holding structure(s) and to divert stormwater runoff around the wastewater storage wastewater holding structure(s).
e) Provide sediment and erosion control sufficient to prevent or minimize sediment loss off of the property, and to protect embankments from erosion.

Stormwater runoff is based on frequency and intensity of precipitation and site conditions. BMPs are very site specific and dependent on the activities occurring onsite, the topography of the site, site size, county ordinances, the precipitation events, and wind direction. For potential BMPs for the site, the facility could utilize:

- National Menu of Best Management Practices for Stormwater
- Protecting Water Quality Field Guide
- Minnesota Pollution Control Agency's Industrial Stormwater BMP Guidebook
- Nevada Best Management Practices Handbook,
- Idaho Catalog of Storm Water Best Management Practices
- EPA's Sector O: Steam Electric Power Generating Facilities Fact Sheet Series

## D. Social and Economic Importance

The affected community consists of the Village of Turney and the surrounding area of Clinton County. During peak construction, activities related to building the energy center will require 300-400 people. Traffic and activity during that phase will be noticeable, but of variable duration and only during construction. After the unit is in-service, estimates are less than 12 people will usually be on-site at any given time. Traffic impact will be minimal. Below is a snapshot of the community indicators for the Village of Turney and Clinton County as a whole from the department's prescreening tool that is utilized in cost of compliance determinations. It shows that both Turney and Clinton County are experiencing growth above the state average, and having the infrastructure such as this peaking plant will provide a benefit to the area with the necessary electricity, along with supplying jobs during construction and post-construction of the energy center.

**Table 0-3: Village of Turney Socio-Economic Data**

| Administrative Unit | Turney Village | Missouri State | United States |
|---|---|---|---|
| Population (2023) | 181 | 6,168,181 | 332,387,540 |
| Percent Change in Population (2000-2023) | 16.8% | 10.2% | 18.1% |
| 2023 Median Household Income (in 2024 Dollars) | $83,003 | $70,567 | $80,011 |
| Percent Change in Median Household Income (2000-2023) | 20.7% | -1.2% | 1.2% |
| Median Age (2023) | 38.6 | 38.9 | 38.7 |
| Change in Median Age in Years (2000-2023) | 1.0 | 2.8 | 3.4 |
| Unemployment Rate (2023) | 3.3% | 4.1% | 5.2% |
| Percent of Population Below Poverty Level (2023) | 11.6% | 12.6% | 12.4% |
| Percent of Household Received Food Stamps (2023) | 8.2% | 9.9% | 11.8% |
| (Primary) County Where the Community Is Located | Clinton County | | |

**Table 0-4: Clinton County Socio-Economic Data**

| Administrative Unit | Clinton County | Missouri State | United States |
|---|---|---|---|
| Population (2023) | 21,259 | 6,168,181 | 332,387,540 |
| Percent Change in Population (2000-2023) | 12.0% | 10.2% | 18.1% |
| 2023 Median Household Income (in 2024 Dollars) | $72,708 | $70,567 | $80,011 |
| Percent Change in Median Household Income (2000-2023) | -9.1% | -1.1% | 1.9% |
| Median Age (2023) | 42.1 | 38.9 | 38.7 |
| Change in Median Age in Years (2000-2023) | 3.2 | 2.7 | 3.5 |
| Unemployment Rate (2023) | 4.4% | 4.1% | 5.2% |
| Percent of Population Below Poverty Level (2023) | 12.8% | 12.6% | 12.4% |
| Percent of Household Received Food Stamps (2023) | 7.3% | 9.9% | 11.8% |

## DERIVATION AND DISCUSSION OF PARAMETERS, LIMITS, AND PERFORMANCE BASED EFFLUENT LEVELS

Wasteload allocations and limits were calculated using two methods:

A. **Water quality-based** – Using water quality criteria or water quality model results and the dilution equation below:

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

Where C = downstream concentration (mg/L)
$C_s$ = upstream concentration (mg/L)
$Q_s$ = upstream flow (cfs)
$C_e$ = effluent concentration (mg/L)
$Q_e$ = effluent flow (cfs)

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).

B. **Alternative Analysis-based** – Using the preferred alternative's treatment capacity for conventional pollutants such as $BOD_5$ and TSS that are provided by the consultant as the WLA, the performance based effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 to derive the average weekly limit (AWL).

Note: Performance based effluent limits have been based on the authority included in Section I.A. of the AIP. Also under 40 CFR 133.105, permitting authorities shall require more stringent limitations than equivalent to secondary treatment limitations for 1) existing facilities if the permitting authority determines that the 30-day average and 7-day average $BOD_5$ and TSS effluent values could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average $BOD_5$ and TSS effluent values could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

**PHYSICAL:**

**Flow.** Per 40 CFR Part 122.44(i)(1)(ii) the volume of effluent discharged from each outfall is needed to ensure compliance with permitted effluent limitations. The facility will report the total maximum daily flow and average in millions of gallons per day (MGD). Flows based on demand, time of year, and weather events. Design is based on peak process water flows up to 77 gpm (110,880 gpd) operation plus stormwater events.

**CONVENTIONAL:**

**Chlorine, Total Residual (TRC)**
Facility receives potable water from public water supply which is chlorinated. Potable water is required to meet minimum residual chlorine limits under the Safe Drinking Water Act; however, the water quality based effluent limits in 10 CSR 20-7.031 are more protective for aquatic life. With the settling pond after the treatment process, there may be sufficient time for the chlorine to dissipate prior to discharge. However, the facility may decide to install a dechlorination unit within their process to ensure the chlorine residual is below the method detection limit. The department has established a minimum detection level (ML) for this parameter; the ML is 50 µg/L.

Acute AQL: 19 µg/L
Chronic AQL: 11 µg/L

Acute WLA: Ce = ((0.309 cfsDF + 0 cfsZID) * 19 – (0 cfsZID * 0 background)) / 0.309 cfsDF = 19
Chronic WLA: Ce = ((0.309 cfsDF + 0 cfsMZ) * 11 – (0 cfsMZ * 0 background)) / 0.309 cfsDF = 11
LTAa: WLAa * LTAa multiplier = 19 * 0.321 = 6.101 [CV: 0.6, 99th %ile]
LTAc: WLAc * LTAc multiplier = 11 * 0.527 = 5.802 [CV: 0.6, 99th %ile]
use most protective LTA: 5.802
Daily Maximum: MDL = LTA * MDL multiplier = 5.802 * 3.114 = 18.069 µg/L [CV: 0.6, 99th %ile]
Monthly Average: AML = LTA * AML multiplier = 5.802 * 1.552 = 9.007 µg/L [CV: 0.6, 95th %ile, n=4]

This antidegradation contains a Total Residual Chlorine (TRC) limit. The effluent limit is below the minimum quantification level of the most sensitive EPA approved CLTRC methods. The department has determined the current acceptable minimum level (ML) for total residual chlorine is 50 µg/L when using the DPD Colorimetric Method #4500 – CL G from Standard Methods for the Examination of Waters and Wastewater. The facility will

conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured and detection values greater than or equal to the ML of 50 µg/L will be considered violations of the permit and non-detect values less than the ML of 50 µg/L will be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits.

**Oil & Grease**
The water quality based effluent limit is Daily Maximum of 15 mg/L and monthly average of 10 mg/L. Oil and grease is a comprehensive test which measures for gasoline, diesel, crude oil, creosote, kerosene, heating oils, heavy fuel oils, lubricating oils, waxes, and some asphalt and pitch.

**pH**
6.5 to 9.0 SU – instantaneous grab sample. Water quality limits per 10 CSR 20-7.031(5)(E) are appropriate as WQBEL is more protective than the TBEL.

**Total Suspended Solids (TSS)**
While the facility is not subject to the federal effluent limit guideline in 40 CFR 423.15(b)(3), the daily maximum of 100 mg/L and monthly average of 30 mg/L is commonly applied at other single cycle natural gas plants in the state that utilize basins for settling. Since there is not a numeric Water Quality Standard for TSS in Missouri, the technology based effluent limit of 30 mg/L monthly average established in the federal effluent limit guideline was used as the basis used for establishing effluent limits.

**METALS:**

**Copper, Total Recoverable.**
Monitoring only. Copper was present in the potable drinking water results provided as part of the Antidegradation Review. The facility is collecting additional samples. Effluent limits are listed below for the facility's awareness.

Acute AQL: e^(1.0166 * ln200 – 3.062490) * (1.136672 – ln200 *0.041838) = 25.815 µg/L [at hardness 200]

Chronic AQL: e^(0.7977 * ln200 – 3.909) * (1.101672 – ln200*0.041938) = 16.193 µg/L

TR Conversion: AQL/Translator = 25.815 / 0.96 = 26.891

TR Conversion: AQL/Translator = 16.193 / 0.96 = 16.868

Acute WLA: Ce = ((0.309 cfsDF + 0 cfsZID) * 26.891 – (0 cfsZID * 0 background)) / 0.309 cfsDF = 26.891

Chronic WLA: Ce = ((0.309 cfsDF + 0 cfsMZ) * 16.868 – (0 cfsMZ * 0 background)) / 0.309 cfsDF = 16.868

LTAa: WLAa * LTAa multiplier = 26.891 * 0.321 = 8.634 [CV: 0.6, 99th %ile]

LTAc: WLAc * LTAc multiplier = 16.868 * 0.527 = 8.897 [CV: 0.6, 99th %ile]

use most protective LTA: 8.634

Daily Maximum: MDL = LTA * MDL multiplier = 8.634 * 3.114 = 26.9 µg/L [CV: 0.6, 99th %ile]

Monthly Average: AML = LTA * AML multiplier = 8.634 * 1.552 = 13.4 µg/L [CV: 0.6, 95th %ile, n=4]

**NUTRIENTS:**

**Ammonia, Total as Nitrogen.**
Monitoring only. Nitrogen is expected to be present in this discharge, especially as the facility will be collecting a portion of stormwater on the site that potentially be running off surrounding agricultural lands, therefore monitoring is required per 10 CSR 20-7.015(9)(D)8.B.

**Kjeldahl Nitrogen, Total (TKN)**
Monitoring only. Nitrogen is expected to be present in this discharge, especially as the facility will be collecting a portion of stormwater on the site that potentially be running off surrounding agricultural lands, therefore monitoring is required per 10 CSR 20-7.015(9)(D)8.B.

**Nitrate plus Nitrite**
Monitoring only. Nitrogen is expected to be present in this discharge, especially as the facility will be collecting a portion of stormwater on the site that potentially be running off surrounding agricultural lands, therefore monitoring is required per 10 CSR 20-7.015(9)(D)8.B.

**Nitrogen, Total (TN)**
Monitoring only. Nitrogen is expected to be present in this discharge therefore reporting is required utilizing best professional judgment per 10 CSR 20-7.015(9)(I)1.

**Total Phosphorus**
Monitoring only. Phosphorus is expected to be present in this discharge therefore monitoring is required per 10 CSR 20-7.015(9)(D)8.B. At this point, the proposed Turney Energy Center is not considered a major facility under EPA's rating framework and total phosphorus limits are not required.

**OTHER:**

**Chloride**
The facility utilizes a demineralization process. Chlorides are an expected pollutant of concern at the facility, which the facility proposed meeting the water quality based effluent limits, as the facility is a peaking facility that is not continuously operational.

Acute AQL: 860 mg/L
Chronic AQL: 230 mg/L

Acute WLA: Ce = ((0.309 cfsDF + 0 cfsZID) * 860 – (0 cfsZID * 0 background)) / 0.309 cfsDF = 860
Chronic WLA: Ce = ((0.309 cfsDF + 0 cfsMZ) * 230 – (0 cfsMZ * 0 background)) / 0.309 cfsDF = 230
LTAa: WLAa * LTAa multiplier = 860 * 0.321 = 276.132 [CV: 0.6, 99th %ile]
LTAc: WLAc * LTAc multiplier = 230 * 0.527 = 121.31 [CV: 0.6, 99th %ile]
use most protective LTA: 121.31

Daily Maximum: MDL = LTA * MDL multiplier = 121.31 * 3.114 = 377.8 mg/L [CV: 0.6, 99th %ile]
Monthly Average: AML = LTA * AML multiplier = 121.31 * 1.552 = 188.3 mg/L [CV: 0.6, 95th %ile, n=4]

**Sulfate**
Monitoring required to determine chloride plus sulfate below. The facility shall sample and independently report the analytical value of sulfate. There are no independent WQS applicable to this discharge for sulfate only.

**Chloride Plus Sulfate**
The facility utilizes a demineralization process. Chlorides and sulfates are an expected pollutant of concern at the facility, which the facility proposed meeting the water quality based effluent limits, as the facility is a peaking facility that is not continuously operational.

Acute AQL: 1000 mg/L

Acute WLA: Ce = ((0.309 cfsDF + 0 cfsZID) * 1000 – (0 cfsZID * 0 background)) / 0.309 cfsDF = 1000

LTAa: WLAa * LTAa multiplier = 1000 * 0.321 = 321.083 [CV: 0.6, 99th %ile]

Daily Max: MDL = LTA * MDL multiplier = 321.083 * 3.114 = 1000 mg/L [CV: 0.6, 99th %ile]
Monthly Avg: AML = LTA * AML multiplier = 321.083 * 1.552 = 498.5 mg/L [CV: 0.6, 95th %ile, n=4]

## GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDEGRADATION REVIEW

A. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(2) Continuing Authorities and 10 CSR 20-6.010(4)(A)5.B., consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
B. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
C. Changes to Federal and State Regulations (FSR) made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
D. Effluent limitations derived from FSR may be WQBEL or Effluent Limit Guidelines (ELG).
E. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
F. A WQAR does not allow discharges to waters of the State and shall not be construed as a National Pollution Discharge Elimination System (NPDES) or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
G. Limitations and other requirements in a WQAR may change as Water Quality Standards (WQS), Methodology, and Implementation procedures change.
H. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.
I. If the proposed treatment technology is not covered in 10 CSR 20-8 Design Guides, the treatment process may be considered a new technology. As a new technology, the permittee would need to work with the review engineer to ensure equipment is sized properly. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation. This Antidegradation Review is based on the information provided by the facility and is not a comprehensive review of the proposed treatment technology. If the review engineer determines the proposed technology will not consistently meet proposed effluent limits, the permittee will be required to revise their Antidegradation Report.

## ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

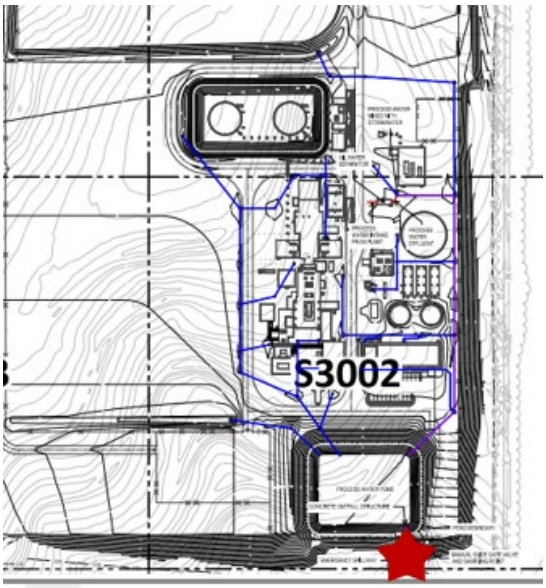
The proposed discharge location of the AECI- Turney Energy Center is expected to result in a reduction by 10 percent or more of the pollutant assimilative capacity of the unnamed tributary to the Presumed Use Stream, which flows into Little Platte Creek. As the discharge is based on utilizing the demineralization system for the simple cycle cooling, with the process wastewater discharged to a lagoon-based system to allow for heat dissipation and settling prior to discharge, was determined to be the base case technology (lowest cost alternative that meets technology and water quality based effluent limitations). The cost effectiveness of the other technology evaluated were not found to be cost effective due to the Turney Energy Center being a peaking plant and as such were not selected.

Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. The department has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewer: Leasue Meyers, EI
Date: May 2025
Reviewer: Cailie Carlile, P.E.

## APPENDIX B: MAP OF DISCHARGE LOCATION & PROCESS FLOW DIAGRAM

APPENDIX B-1: DISCHARGE MAP

# APPENDIX B-2: PROCESS FLOW DIAGRAM