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 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0000361
Owner:	Union Electric Company d/b/a Ameren Missouri
Address:	1901 Chouteau Avenue, P.O. Box 66149, MC 602, St. Louis, MO 63166-6149
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Ameren Missouri – Meramec Energy Center
Facility Address:	8200 Fine Road, St. Louis, MO 63129
Legal Description:	Sec. 3, T42N, R6E St. Louis County
UTM Coordinates:	See following page
Receiving Stream:	See following page
First Classified Stream and ID:	See following page
USGS Basin & Sub-watershed No.:	Carr Creek – Mississippi River 07140101-0603 (outfalls #006, #007)
	Meramec River 07140102-1004 (outfalls #003, #008, #009, #010, #011, #012)

authorizes activities pursuant to the terms and conditions of this permit in accordance with the Missouri Clean Water Law and/or the National Pollutant Discharge Elimination System; it does not apply to other regulated activities.

FACILITY DESCRIPTION

SIC # 4911; NAICS # 221112. No electrical generation occurring. The former ash ponds are capped. This facility does not require a certified wastewater operator per 10 CSR 20-9.030 as this facility is privately owned. Domestic wastewater is managed by piping to POTW. This facility no longer utilizes the cooling water intake structure or discharges cooling water; no longer 316(b). See next page.

June 1, 2024
Effective Date

May 31, 2029
Expiration Date

John Hoke, Chief, Water Pollution Program

FACILITY DESCRIPTION (CONTINUED)

For the purposes of this permit, non-contact stormwater is stormwater which has not contacted ash. Ash contact stormwater is not authorized for discharge under this permit. The bottom ash pond was closed September 2024. Coal pile runoff has been eliminated because all coal has been removed from the site, equipment washing is not occurring.

OUTFALL #003 – Historic ash retention pond discharges ash contact stormwater only., Outfall 003 will receive only stormwater that falls directly in the retention pond. All other sources of stormwater are pumped to Outfall 010. All wastewater sources onsite, were removed mid-September, 2023. Current authorized water discharge for outfall #003 is stormwater only with ash residuals.

UTM Coordinates:	X = 731964, Y= 4254430
Receiving Stream:	Tributary to Meramec River
First Classified Stream and ID:	Presumed Use Stream (C) WBID# 5027
Old Design Flow:	23.55 MGD
Average Flows:	now completely dependent on precipitation

OUTFALL #005 – Combined drain sump emergency overflow; no permission to discharge wastewater at this outfall. If a discharge from the combined sump occurs, that is considered an unauthorized discharge and must be reported pursuant to Standard Conditions I.

UTM Coordinates:	X = 732763, Y = 4253522
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) WBID# 1707.02

OUTFALL #006 – Caisson sump and screen wash discharge; no NPDES sampling required at this time. The pump removes collected river water and stormwater from the caisson; removal of this water will continue even though the facility is not utilizing the cooling water intake system for cooling water.

UTM Coordinates:	X = 732989, Y = 4253664
Receiving & First Classified Stream and ID:	Mississippi River (P) WBID# 1707.02
Old Design Flow:	1.5 MGD
Discharge only Caisson Sump:	0.049 MGD; intermittent

OUTFALL #007 – non-contact stormwater, prior employee parking lot stormwater runoff; 25 ac.

UTM Coordinates:	X = 732941, Y = 4253659
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) WBID# 1707.02

OUTFALL #008 – non-contact stormwater, closed ash pond stormwater runoff; 86 ac.

UTM Coordinates:	X = 732371, Y = 4254547
Receiving Stream:	Tributary to Meramec River
First Classified Stream and ID:	Presumed Use Stream (C) WBID# 5027
USGS Basin & Sub-watershed No.:	Meramec River 07140102-1004

OUTFALL #009 – non-contact stormwater, closed ash pond stormwater runoff; 42 ac.

UTM Coordinates:	X = 731874, Y = 4253428
Receiving & First Classified Stream and ID:	Meramec River (P) WBID# 2183

OUTFALL #010 – new outfall, Closure Water Treatment System (CWTS); no new wastewater flow types or pollutants of concern; only discharges stormwater. The combined drain sump including dirty water sump, the stormwater lift station and stormwater runoff from other areas of the site are discharged. This outfall is non-contact stormwater only. Discharge flows west to the Meramec. Because the Meramec Station is closing, the facility is working on re-grading the site. The treatment basin has a total area of 3.7 acres with a depth of 16 feet and is sized to accommodate 110% of a 25 year 24 hour storm event. Stormwater from 78 acres. Treatment: best management practices, settling, pH adjustment if required (CO_2, Sulfuric Acid, and/or NaOH), and polymer flocculation if required.

UTM Coordinates:	X = 732405, Y = 4253676
First Classified Stream and ID:	Meramec River (P) WBID# 2183
Design Flow:	10.8 MGD

OUTFALL #011 – new non-contact stormwater, closed ash pond stormwater runoff; 8 ac.

UTM Coordinates:	X = 731819, Y = 4253970
Receiving & First Classified Stream and ID:	Meramec River (P) WBID# 2183

OUTFALL #012 – new non-contact stormwater, closed ash pond stormwater runoff; 14 ac.

UTM Coordinates:	X = 731766, Y = 4254153
Receiving & First Classified Stream and ID:	Meramec River (P) WBID# 2183

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #003 *Stormwater*	**TABLE A-1** **INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The facility is authorized to discharge from outfall(s) as specified. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in Table A-2 must be achieved as soon as possible but no later than **June 1, 2027**. These interim effluent limitations are effective beginning **June 1, 2024** and remain in effect through **May 31, 2027** or as soon as possible. Discharges shall be controlled, limited, and monitored by the facility as specified below:

EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS		MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE	MINIMUM MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: M (MONTHLY)					
PHYSICAL					
Flow	MGD	*	*	weekly ‡	24 hr. total
CONVENTIONAL					
Oil & Grease	mg/L	15	10	once/month	grab
pH †	SU	6.5 to 9.0	-	weekly ‡	grab
Total Suspended Solids	mg/L	100	30	once/month	grab
METALS					
Aluminum, Total Recoverable	µg/L	1865	*	once/month	grab
Boron	µg/L	2000	*	once/month	grab
Chromium, Total	µg/L	*	*	once/month	grab
Chromium, VI, Dissolved ♠	µg/L	50	*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JULY 28, 2024.

OUTFALL #003 *Stormwater*	**TABLE A-2** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

The facility is authorized to discharge from outfall(s) as specified. The final effluent limitations shall become effective on **June 1, 2027** and remain in effect until expiration of the permit. Discharges shall be controlled, limited, and monitored by the facility as specified below:

EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS		MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE	MINIMUM MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: M (MONTHLY)					
PHYSICAL					
Flow	MGD	*	*	weekly ‡	24 hr. total
CONVENTIONAL					
Oil & Grease	mg/L	15	10	once/month	grab
pH †	SU	6.5 to 9.0	-	weekly ‡	grab
Total Suspended Solids	mg/L	100	30	once/month	grab
METALS					
Aluminum, Total Recoverable	µg/L	750	*	once/month	grab
Boron	µg/L	2000	*	once/month	grab
Chromium, Total	µg/L	*	*	once/month	grab
Chromium, VI, Dissolved ♠	µg/L	16	*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JULY 28, 2027.

NOTES:

* Monitoring and reporting requirement only

⁑ Weekly monitoring is monitoring any one day between Monday and Sunday. For weeks spanning two months, only 1 sample is required. Only samples collected in the month may be averaged for the month. All data obtained must be uploaded as a DMR attachment per Standard Conditions.

† pH: the facility will report the minimum and maximum values; pH is not to be averaged.

♠ This permit establishes effluent limitations and monitoring for dissolved hexavalent chromium. This permit establishes the requirement to use Standard Method 3500-Cr C-2011 or newer to ensure data submitted to the Department conforms to the most sensitive method as required by Standard Conditions Part I §A No. 4 and is analyzed within the required method holding times.

B. SCHEDULE OF COMPLIANCE

Schedules of compliance are allowed per 40 CFR 122.47 and 10 CSR 20-7.031(11). The facility shall attain compliance with final effluent limitations established in this permit as soon as reasonably achievable:

1. The facility shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every 12 months from effective date. The first report is due **JUNE 1, 2025**.

2. For hexavalent chromium at outfall #003, the facility will have 3 years to meet the final effluent limits.

3. No later than six months from the issuance date of this permit, Permittee shall submit to MDNR a plan for evaluating and identifying concentration levels for boron located at or near the property boundary.

4. For groundwater, within 5 years of the effective date of this permit, the facility must meet 2000 µg/L for total recoverable boron in the groundwater wells. 2000 µg/L is the value after any treatment is installed, that monitor groundwater leaving the site. Internal groundwater monitoring wells are not required to meet this value.

   In the event Permittee elects to complete and submit a RBCA report as referenced in the Fact Sheet, such report shall take into consideration site hydrogeology (including groundwater flow and surface water flow), exposure pathways, receptors and acceptable risk levels as authorized under 10 CSR 25-18.010. Submission of a report under 10 CSR 25-18.010 shall occur no later than 12 months prior to expiration of this permit.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I standard conditions dated August 1, 2014, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Stormwater Management Areas:
   Permitted features #003, #007, #008, #009, #010, #011, and #012 and the respective drainage (watershed) areas. No design flow is established for stormwater as the actual discharge flows are completely dependent on precipitation, hypsography, ground cover, and BMPs employed. This area encompasses approximately 250 acres. This stormwatershed is characterized by let-down channels from the closed ash pond, paved and graveled roads, graveled banks, secondary roadways, some impervious surfaces, and rail lines. Vegetative buffers are utilized to decrease stormwater velocity. Infiltration of stormwater is not desired as the pond cap is not designed to allow infiltration. The vegetation consists of primarily grasses maintained by seasonal mowing. This area is required to be included in the permit per 40 CFR 122.26(b)(14); these areas are subject to 40 CFR 122.44(k) stormwater regulations. Stormwater which has contacted ash or wastewater is not permissible for discharge at these outfalls.
   The following are established as minimum Best Available Technology (BAT) requirements for stormwater: This facility is required to complete quarterly inspections of the drainage areas of the plant's stormwater point sources and will initiate maintenance as necessary to prevent contamination.
   (a) Timely maintenance shall be performed, regrading and/or revegetation of plant access roads, drainage swales, and perimeter yards to avoid excessive erosion and/or creation of new stormwater discharges.

(b) Procedural controls (such as visual inspections) to prevent materials, contamination from equipment storage, and/or contamination from laydown areas within stormwater point source drainage areas
(c) Case by case evaluation of non-routine projects (such as dismantling structures on site) within stormwater drainage areas to prevent unauthorized discharges; assess the potential for contamination of runoff, and to implement appropriate protective measures.
(d) Control, minimize, or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the coal ash waste mass.
(e) Prevent future impoundment of water on top of the coal ash waste mass.
(f) Provide for slope stability to protect against sloughing or movement of the final cover system over the coal ash waste mass.
(g) Further requirements listed under special condition "Stormwater Pollution Prevention Plan (SWPPP)."
(h) Further requirements listed under special condition "Site-wide minimum Best Management Practices (BMPs)."

2. The facility may take stormwater samples at any time to determine BMP effectiveness. the facility will submit the sampling results to the Department via the eDMR system.

3. Groundwater Requirements.
(a) This permit allows subsurface to surface discharges from coal ash impoundments. Numeric technology effluent limits are not established. The Department has chosen the Best Available Technology (BAT) of Monitored Natural Attenuation (MNA) for the closed ash holding areas. This decision will be revisited at the next renewal.
(b) The facility shall maintain a monitoring well network that effectively measures pollutant concentrations of all parameters of concern (Coal ash parameters of concern are found at 40 CFR 257 §D Appendices III and IV).
(c) Monitoring wells shall be constructed and closed in accordance with all applicable well requirements pursuant to 10 CSR 23.

4. Groundwater will continue to be monitored per applicable federal regulations. The Department may request this information be submitted at any time.

5. Discharge is not permitted from outfall #005. Discharge for any reason shall constitute a permit violation and shall be reported in accordance with Standard Conditions, Part 1, Section B.2.b.

6. This permit authorizes application of water to roadways for dust suppression and to vegetative areas to provide irrigation to vegetation. As a BMP, the ash impoundment storage area cap must maintain seasonally appropriate vegetation levels to prevent solids runoff. This is a *de minimis* determination. All water on site may be used.

7. The facility does not have authorization to use waters of the state or waters of the United States for the purposes of cooling. This permit revokes the applicability of the requirements established under Clean Water Act 316(b), regulatory application requirements of 40 CFR 122.21(r) et seq, and therefore is not establishing Best Available Technology under 40 CFR 125 Subpart J for cooling water intakes.

8. The facility ceased generating electricity from steam-cycle sources intended for the purposes of sale on December 31, 2022. Discharging waste heat from single pass cooling of steam cycle units is hereby a violation of this permit. Thermal discharge from outfalls #001 and #002 is prohibited.

9. The Best Available Technology for the ash ponds is currently established as Monitored Natural Attenuation per best professional judgement and 40 CFR 125.3. This facility is subject to 40 CFR 257 Subpart D therefore additional requirements may be applied outside of this permit. If there are any discrepancies in this permit and the federal regulations, the more stringent requirement must be utilized.

10. Spills, Overflows, and Other Unauthorized Discharges.
(a) Any spill, overflow, or other discharge(s) not specifically authorized are unauthorized discharges.
(b) If an unauthorized discharge cause or permit any contaminants to discharge or enter waters of the state, the unauthorized discharge must be reported to the regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's 24 hour spill line at 573-634-2436.

11. Electronic Discharge Monitoring Report (eDMR) Submission System. The NPDES Electronic Reporting Rule, 40 CFR Part 127, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit), shall be submitted via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data for the NPDES program. The eDMR system is currently the only Department-approved reporting method for this permit unless specified elsewhere in this permit, or a waiver is granted by the Department. The facility must register in the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. All reports uploaded into

the system shall be reasonably named so they are easily identifiable, such as “WET Test Chronic Outfall 002 Jan 2023”, or “Outfall004-DailyData-Mar2025”.

12. Stormwater Pollution Prevention Plan (SWPPP).
The facility’s SIC code or description is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) and hence shall implement a Stormwater Pollution Prevention Plan (SWPPP) which must be prepared and implemented upon permit effective date. The SWPPP must be kept on-site and not sent to the Department unless specifically requested. The SWPPP must be reviewed and updated annually or if site conditions affecting stormwater change. The facility shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002 March 2021) https://www.epa.gov/sites/production/files/2021-03/documents/swppp_guide_industrial_2021_030121.pdf The purpose of the SWPPP and the Best Management Practices (BMPs) listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was ineffective at providing the necessary protections for which it was designed. Corrective action describes the steps the facility took to eliminate the deficiency. The SWPPP must include:
    (a) A listing of specific contaminants and their control measures (BMPs) and a narrative explaining how BMPs are implemented to control and minimize the amount of contaminants potentially entering stormwater.
    (b) A map with all outfalls and structural BMPs marked.
    (c) If within the boundaries of a regulated Municipal Separate Storm Sewer System (MS4s), list the name of the regulated MS4.
    (d) A schedule for at least once per month site inspections and brief written reports. The inspection report must include precipitation information for the entire period since last inspection, as well as observations and evaluations of BMP effectiveness. A BMP is considered to be disrupted if it is rendered ineffective as a result of damage or improper maintenance. Categorization of a deficiency is reliant on the length of time required to correct each disrupted BMP. Corrective action after discovering a disrupted BMP must be taken as soon as possible. Throughout coverage under this permit, the facility must perform ongoing SWPPP review and revision to incorporate any site condition changes.
        (1) Operational deficiencies are disrupted BMPs which the facility is able to and must correct within 7 calendar days.
        (2) Minor structural deficiencies are disrupted BMPs which the facility is able to and must correct within 14 calendar days.
        (3) Major structural deficiencies (deficiencies projected to take longer than 14 days to correct) are disrupted BMPs which must be reported as an uploaded attachment through the eDMR system with the DMRs. The initial report shall consist of the deficiency noted, the proposed remedies, the interim or temporary remedies (including proposed timing of the placement of the interim measures), and an estimate of the timeframe needed to wholly complete the repairs or construction. If required by the Department, the facility shall work with the regional office to determine the best course of action. The facility may consider temporary structures to control stormwater runoff. The facility shall correct the major structural deficiency as soon as reasonably achievable.
        (4) All actions taken to correct the deficiencies shall be included with the written report, including photographs, and kept with the SWPPP. Additionally, corrective action of major structural deficiencies shall be reported as an uploaded attachment through the eDMR system with the DMRs.
        (5) BMP failure causing discharge through an unregistered outfall is considered an illicit discharge and must be reported in accordance with Standard Conditions Part I.
        (6) Inspection reports must be kept on site with the SWPPP and maintained for a period of five (5) years. These must be made available to Department personnel upon request. Electronic versions of the documents and photographs are acceptable.
    (e) A provision for designating a responsible individual for environmental matters and a provision for providing training to all personnel involved in housekeeping, material handling (including but not limited to loading and unloading), storage, and staging of all operational, maintenance, storage, and cleaning areas. Proof of training shall be submitted upon request by the Department.

13. Site-wide minimum Best Management Practices (BMPs). At a minimum, the facility shall adhere to the following:
    (a) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
    (b) Dumpsters must remain closed when not in use.
    (c) 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.
    (d) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
    (e) Store all paint, solvents, petroleum products, petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so these materials are not exposed to stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater 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. Spill records shall be retained on-site or readily accessible electronically.

(f) Provide sediment and erosion control sufficient to prevent or minimize sediment loss off of the property, and to protect embankments from erosion.
(g) Wash water for vehicles, building(s), or pavement must be handled in a no-discharge manner (infiltration, hauled off-site, etc.). Describe the no-discharge method used and include all pertinent information (quantity/frequency, soap use, effluent destination, BMPs, etc.) in the application for renewal. If wash water is not produced, note this instead.
(h) The facility shall not apply salt and sand (traction control) in excess of what is required to maintain safe roadways and walkways. In the spring, after potential for additional snow or ice accumulation, if there is evidence of significant excess traction control materials, the facility shall remove excess sand or salt as soon as possible to minimize and control the discharge of salt and solids. At all times the facility shall use salt judiciously to minimize freshwater salinization.
(i) Salt and sand shall be stored in a manner minimizing mobilization in stormwater (for example: under roof, in covered container, under tarp, etc.).

14. This facility may discharge (or allow to infiltrate) fire protection testing wastewater. This is a *de minimis* determination. The receiving streams provide mixing and there is no RP for chlorine for this activity.

15. Secondary Containment. The drainage areas around the secondary containment areas and the interior of the containment areas shall be inspected weekly. Solids, sludge, and soluble debris shall not be allowed to accumulate in the secondary containment.
(a) The interior of the secondary containment areas shall be checked at least weekly for signs of leaks, spills, or releases of petroleum.
(b) All petroleum captured in the secondary containment areas shall be expeditiously removed and the source of the petroleum determined. Leaks or otherwise compromised equipment or appurtenances shall be promptly addressed/repaired.
(c) Before releasing water accumulated in petroleum secondary containment areas, the water and area must be examined for hydrocarbon odor and presence of sheen to protect the general criteria found at 10 CSR 20-7.031(4).
(d) Unimpacted stormwater (i.e. free from hydrocarbon odor and presence of sheen), must be drained from the secondary containment as soon as reasonably possible after a precipitation event.
(e) If subparts (a) and (b) above were not followed, impacted stormwater shall not be discharged from the secondary containment and shall instead be managed in accordance with legally approved methods for disposal of process wastewater, such as being sent to an accepting wastewater treatment facility.
(f) If subparts (a) and (b) were followed, impacted stormwater can only be drained from the secondary containment after removal of all odor or sheen utilizing appropriate methods.
(g) The area surrounding the secondary containment must be free of signs of vegetative stress or other indicia of petroleum discharge.
(h) The area below the outlet of the secondary containment area must be maintained to minimize soil washout, such as with stabilized vegetation, rip rap, or by releasing accumulated water slowly.
(i) Records of all inspections, testing, and/or treatment of water accumulated in secondary containment shall be available on demand to the Department. Electronic records retention is acceptable. These records must be included in the SWPPP.

16. Oil/Water Separators. This site is authorized to operate oil water separator tanks (if considered USTs) for the treatment of wastewater or stormwater and falls under 10 CSR 26-2.010(2)(B) if treating water with petroleum oils. OWS, serving this facility are hereby authorized and shall be operated per manufacturer's specifications. The specifications and operating records must be made accessible to Department staff upon request. Petroleum oil water separator sludge is considered used oil; sludge must be disposed of in accordance with 10 CSR 25-11.279. OWS treating animal, vegetable, or food grade oils are not required to be authorized under these regulations. All best management practices for all OWS systems must be adhered.

17. All outfalls and permitted features must be clearly marked in the field.

18. Report no discharge when a discharge does not occur during the report period. It is a violation of this permit to report no-discharge when a discharge has occurred.

19. Reporting of Non-Detects.
(a) Compliance analysis conducted by the facility or any contracted laboratory shall be conducted in such a way the precision and accuracy of the analyzed result can be enumerated. See sufficiently sensitive test method requirements in Standard Conditions Part I, §A, No. 4 regarding proper testing and detection limits used for sample analysis. For the purposes of this permit, the definitions in 40 CFR 136 apply; method detection limit (MDL) and laboratory-established reporting limit (RL) are used interchangeably in this permit. The reporting limits established by the laboratory must be below the lowest effluent limits established for the specified parameter (including any parameter's future limit after an SOC) in the permit unless the permit provides for an ML.
(b) The facility shall not report a sample result as "non-detect" without also reporting the MDL. Reporting "non-detect" without also including the MDL will be considered failure to report, which is a violation of this permit.

(c) For the daily maximum, the facility shall report the highest value; if the highest value was a non-detect, use the less than "<" symbol and the laboratory's highest method detection limit (MDL) or the highest reporting limit (RL); whichever is higher (e.g. <6).
(d) When calculating monthly averages, zero shall be used in place of any value(s) not detected. Where all data used in the average are below the MDL or RL, the highest MDL or RL shall be reported as "<#" for the average as indicated in item (c).

20. Failure to pay fees associated with this permit is a violation of the Missouri Clean Water Law (644.055 RSMo).

21. This permit does not cover land disturbance activities.

22. This permit does not allow stream channel or wetland alterations unless approved by Clean Water Act §404 permitting authorities. This permit does not authorize in-stream treatment, the placement of fill materials in flood plains, placement of solid materials into any waterway, the obstruction of stream flow, or changing the channel of a defined drainage course.

23. All records required by this permit may be maintained electronically. These records can be maintained in a searchable format.

24. Changes in Discharges of Toxic Pollutant. In addition to the reporting requirements under 40 CFR 122.41, all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director per 40 CFR 122.42(a)(1) and (2) as soon as recognizing:
(a) An activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, 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;
(3) Five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol;
(4) One milligram per liter (1 mg/L) for antimony;
(5) Five (5) times the maximum concentration value reported for the pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
(6) The notification level established by the Department in accordance with 40 CFR 122.44(f).
(b) Any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
(1) Five hundred micrograms per liter (500 µg/L);
(2) One milligram per liter (1 mg/L) for antimony;
(3) Ten (10) times the maximum concentration value reported for the pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
(4) The level established by the Director in accordance with 40 CFR 122.44(f).
(c) Authorization of new or expanded pollutant discharges may be required under a permit modification or renewal, and may require an antidegradation review.

25. This permit does not authorize the facility to accept, treat, or discharge wastewater from other sources unless explicitly authorized herein. If the facility would like to accept, treat, or discharge wastewater from another activity or facility, the permit must be modified to include external wastewater pollutant sources in the permit.

26. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with Sections 301, 302, 306, 307, and 403 of the federal Clean Water Act, except for standards imposed under Section 307 for toxic pollutants injurious to human health, and with equivalent provisions of the Missouri Clean Water Law, in accordance with Section 644.051.16 RSMo and CWA §402(k). This permit may be reopened and modified, or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under CWA §§301(b)(2)(C) and (D), §304(b)(2), and §307(a)(2), if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit, or controls any pollutant not already limited in the permit. This permit may be modified, revoked and reissued, or terminated for cause, including determination new pollutants found in the discharge not identified in the application for the new or revised permit. The filing of a request by the facility for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.

27. Any discharges (or qualified activities such as land application) not expressly authorized in this permit, and not clearly disclosed in the permit application, cannot become authorized or shielded from liability under CWA section 402(k) or Section 644.051.16, RSMo, by disclosure to EPA, state, or local authorities after issuance of this permit via any means, including any other permit applications, funding applications, the SWPPP, discharge monitoring reporting, or during an inspection. Submit a permit modification application, as well as an antidegradation determination if appropriate, to request authorization of new or expanded discharges.

28. Renewal Application Requirements.
    (a) This facility shall submit an appropriate and complete application to the Department no less than 180 days prior to the expiration date listed on page 1 of the permit.
    (b) Sufficiently sensitive analytical methods must be used. A sufficiently sensitive method is one that can effectively describe the presence or absence of a pollutant at or below that pollutant's permit limit or water quality standard, whichever is less.
    (c) The facility may use the electronic submission system to submit the application to the Program, if available.

E. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty 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 shall 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

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL OF
MO-0000361
AMEREN – MERAMEC

The Federal Water Pollution Control Act (Clean Water Act (CWA) §402 Public Law 92-500 as amended) established the National Pollutant 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 stormwater from certain point sources. All such discharges are unlawful without a permit (§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 644 RSMo as amended). MSOPs may also cover underground injection, non-discharging facilities, and land application facilities. Permits are issued for a period of five (5) years unless otherwise specified for less.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)(A)2.] a factsheet shall be prepared to give pertinent information regarding applicable regulations, rationale for the development of limitations and conditions, and the public participation process for the Missouri State Operating Permit (MSOP or permit) listed below. A factsheet is not an enforceable part of a permit.

PART I. FACILITY INFORMATION

Facility Type:	Industrial
SIC Code(s):	4911
NAICS Code(s):	221112
Application Date:	06/30/2022
Expiration Date:	12/31/2022

FACILITY DESCRIPTION
The Ameren Missouri Meramec Energy Center was an electric generating facility that initially commenced operations in 1953 as a baseload plant. The plant is located in St. Louis County, near the confluence of the Meramec and Mississippi Rivers. The plant site encompasses approximately 420 acres. Meramec Energy Center had four main units. In April 2016, Units 1 and 2 began to solely utilize natural gas for generation. Units 3 and 4 are coal fired boilers. In recent years, the units were operated as peaking units. Total generation of the four units is approximately 829 MWe. Meramec Energy Center retired on December 31st, 2022. As part of the transition, all site facilities including the surrounding ash ponds must be closed. Ameren is still determining the timing of demolition as well as the fate of certain facility infrastructures at the site.

The facility was rated as a major facility on May 19, 2000. A re-rating worksheet was not completed at this renewal as the ash remains in place. The total design flow has decreased for this facility from 675 MGD to only stormwater. There is no legal definition for non-contact stormwater therefore it is defined in this permit as stormwater which does not contact ash, ash transport water, or is in contact with any other wastewater sources. Non-contact stormwater is also not leachate; leachate is defined in 40 CFR 423. Stormwater does not have a design flow. Outfall #003 discharges stormwater from a basin which has not yet been cleaned out therefore ash still remains and outfall #003 was considered independently of the stormwater management areas; outfall #003 has effluent limits appropriate to the historic practices and current pollutants of concern.

Outfall #010 contains a description for “dirty water sump” which is at the basement of the main building and is stormwater that has seeped into the building. Currently the building is not being heated, the roof is leaking, as well as a couple other places which is allowing rainwater into the building that ultimately ends up in the basement sump. With the decommissioning activities occurring, the water from the dirty water sump is still considered stormwater and is not considered any more contaminated than the rest of the stormwater at the site.

The application was deemed complete per 122.21(g)(7)(i) as the facility supplied the necessary documentation and data to make decisive permit decisions.

Diesel fuel oil is also stored in two aboveground 6,000-gallon tanks for mobile equipment. Both tanks are connected via a common drain tie line. Diesel fuel oil is also stored in an above ground tank adjacent to the diesel driven fire pump. Several above ground storage tanks are located near the merchant coal storage area and used for mobile equipment.

The plant has a SPCC Planning Guide that describes various management practices to minimize oil spills/releases and their contact with stormwater runoff. The SPCC Guide also designates a plant spill coordinator who is available to provide technical assistance and advice related to spill prevention, clean-up, waste management and reporting. Preventive maintenance activities also include routine

inspections of above ground storage tanks, valves, pipelines, and associated equipment. Plant staff conduct the inspections on a regular basis.

Current Outfalls:

Outfall #006 was not sampled in the last permit, nor does this permit require sampling from outfall #006. Water collected in the caisson is from the river or stormwater run-in. Outfall #006 has no processes that warrant sampling although discharge is still permitted from this outfall. The facility has replaced hydraulic valves which contained oil with motor operated valve actuators which do not have an oil component. Outfall #006's major component of the discharge was screen wash water where river water is used to clean the traveling screens which protect aquatic species from being entrained into the cooling water system. Currently, the sump water is the major source of water. The permit writer has determined the new valving system will not discharge oil and grease, and any TSS in the effluent is withdrawn from the river. The permit writer has used best professional judgment to continue not monitoring of this outfall.

New Outfalls

The facility is installing a treatment system to close structures, like the coal pile, and other wastewater sources. Outfall #010 will be the discharge of the new Closure Water Treatment System (CWTS) now that Meramec Energy Center ceases operations. This is stormwater only. The physical discharge location of the outfall is to the Meramec River at the direct confluence of the Mississippi River, just downstream from the current outfall #003. The CWTS contains a detention basin type operating system that is designed to settle out suspended solids by gravity present in stormwater. Treated water is then discharged to the Meramec River via outfall #010. The treatment basin has a total area of 3.7 acres with a depth of 16 feet and is sized to accommodate the maximum treatment design flow rate and maximum treatment design during the initial closure period. The total volume of the closure water treatment basin can accommodate 110% of a 25-year 24 hour storm event. The detention basin includes an emergency overflow on the northeast corner of the basin and will overflow into the low points around the basin within the Ameren rail loop.

The CWTS is designed to treat water from three separate sources. During 2023 and 2024 the combined drain sump (CDS, a stormwater collection point), the stormwater lift station (SLS), and other stormwater sources will be routed to the CWTS. The CDS mainly consists of flows from eight separate water sumps located inside the power building. During this time frame flows to the CWTS will average approximately 1 million gallons per day with maximum flows at 10.8 MGD. The SLS is comprised of stormwater runoff from the CTG area as well as stormwater runoff west of the main power block. Additional stormwater sources routed to the CWTS include areas around the coal pile and the rail receiving area. After the demolition is completed, the CWTS will only process stormwater as seen on Drawing II. As you can see from the drawing stormwater will be included from various locations with flows solely dependent on storm events.

See drawings of closure timeline on the next page.

The facility identified two new outfalls designed to "not discharge", permitted features #011 and #012. however, they are "internal outfalls" that do eventually discharge off site. In a phone call on May 19, 2023, the facility confirmed that new outfalls #011 and #012 do not infiltrate the stormwater underground therefore this is not UIC. The outfalls are permitted as discharging outfalls.

Removed Wastewater Sources
(see also Antidegradation in Part III below)

OUTFALL #001 – historically non-contact single pass cooling water for units 1 & 2 condensate and jacket water coolers; removed 2023 renewal. This facility no longer discharges heated wastewater therefore the limits, monitoring, and reporting requirements were removed; this is not considered backsliding because this wastewater stream no longer exists.

UTM Coordinates:	X = 732928, Y = 4253687
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) WBID# 1707.02
USGS Basin & Sub-watershed No.:	Carr Creek – Mississippi River 07140101-0603
Design Flow:	245 MGD
Average Flows:	74 MGD

OUTFALL #002 – historically non-contact single pass cooling water for units 3 & 4 condensate and jacket water coolers; removed 2023 renewal. This facility no longer discharges heated wastewater therefore the limits, monitoring, and reporting requirements were removed; this is not considered backsliding because this wastewater stream no longer exists.

UTM Coordinates:	X = 732928, Y = 4253687
Receiving Stream:	Mississippi River (P)
First Classified Stream and ID:	Mississippi River (P) WBID# 1707.02
USGS Basin & Sub-watershed No.:	Carr Creek – Mississippi River 07140101-0603

Design Flow: 405 MGD
Average Flows: 208 MGD

OUTFALL #004 – Domestic Wastewater Treatment Plant: sewage treatment plant at Meramec power plant was decommissioned and removed on September 16, 2009. All sanitary wastewater is conveyed to St. Louis MSD (MO-0127949) via sanitary sewer. Outfall removed in September of 2012.

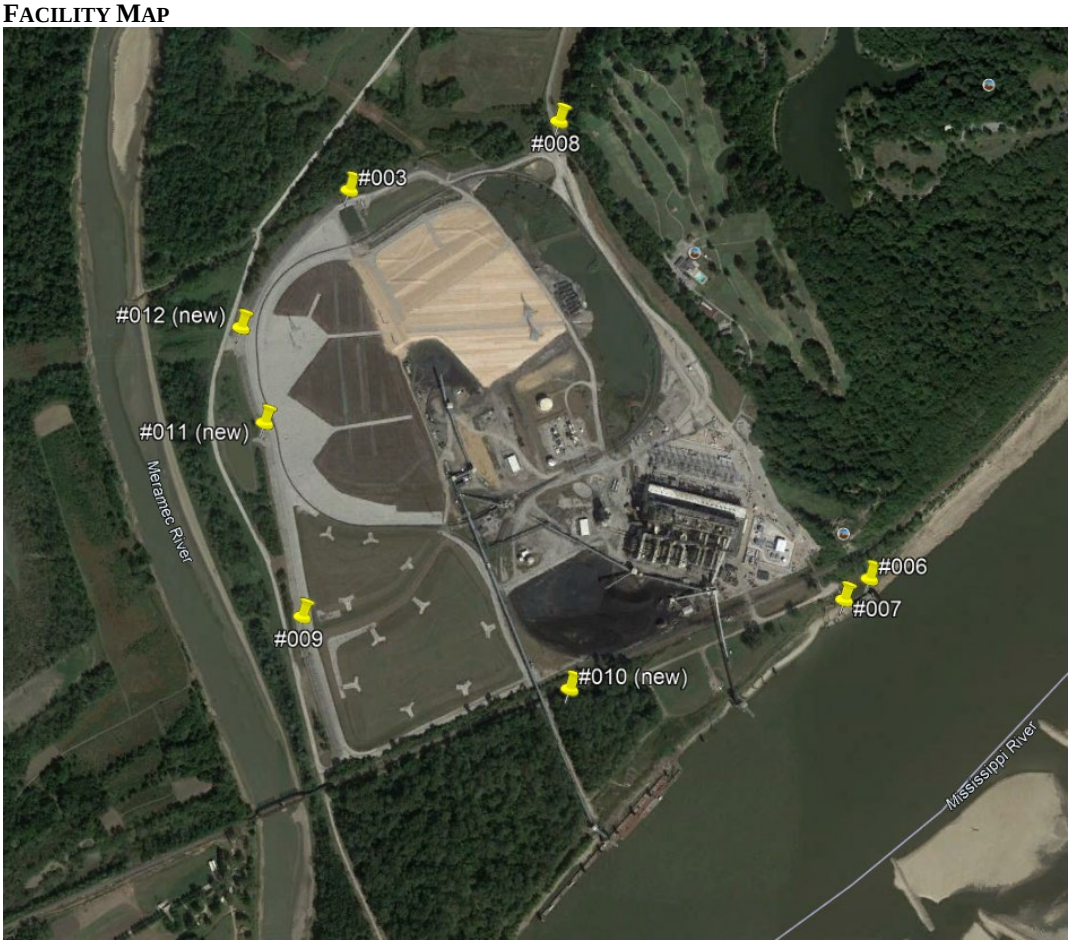
Items listed in the facility (or outfall) description, applicable to the operation, maintenance, control, and resultant effluent quality are required to be enumerated in the facility description. The facility description ensures the facility continues to operate the wastewater (or stormwater) controls listed in the permit to preserve and maintain the effluent quality pursuant to 40 CFR 122.21(e). Any planned changes to the facility (which changes the facility or outfall description) are required to be reported to the Department pursuant to 40 CFR 122.41(l)(1)(ii). If the facility does not or cannot use all of their disclosed treatment devices, this is considered bypassing pursuant to 40 CFR 122.41(m) in the case of wastewater, and BMP disruption in the case of stormwater.

CONTINUING AUTHORITY
Pursuant to 10 CSR 20-6.010(2)(A) and (E), the Department has received the appropriate continuing authority authorized signature from the facility. The Missouri Secretary of State continuing authority charter number for this facility is X001230414 ; this number was verified to be associated with the facility and precisely matches the continuing authority reported by the facility. Pursuant to 10 CSR 20-6.010(2)(B)4, this facility is a Level 4 Authority. This is a stormwater only facility therefore there is no higher authority available.

OTHER ENVIRONMENTAL PERMITS
In accordance with 40 CFR 122.21(f)(6), the Department evaluated other environmental permits currently held by this facility. This facility has the following. An air permit to construct to bag fly ash 042021-006; Project Number: 2021-02-004. These other environmental permits are expected to change based on the status of power generation.

FACILITY PERFORMANCE HISTORY & COMMENTS
The electronic discharge monitoring reports were reviewed for the last five years. Two exceedances of TSS and one pH exceedance (below 6.5) occurred at outfall #003. The TSS exceedances were recent. There has not been an inspection since the last renewal.

FACILITY MAP



PART II. RECEIVING WATERBODY INFORMATION

RECEIVING WATERBODY TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID#	DESIGNATED USES*	DISTANCE TO SEGMENT	12-DIGIT HUC
#003	Presumed Use Stream*	C	5027*	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	0.1 mi	07140102-1004 Meramec River
#005	Mississippi River	P	1707.02	DWS, HHP, IND, IRR, LWW, SCR, WWH (AQL)	0.0 mi	01140101-0603 Carr Creek – Mississippi River
#006	Mississippi River	P	1707.02	DWS, HHP, IND, IRR, LWW, SCR, WWH (AQL)	0.0 mi	
#007	Mississippi River	P	1707.02	DWS, HHP, IND, IRR, LWW, SCR, WWH (AQL)	0.0 mi	
#008	Presumed Use Stream*	C	5027*	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	0.0 mi	07140102-1004 Meramec River
#009	Meramec River	P	2183	DWS, HHP, IND, IRR, LWW, SCR, WBC-A, WWH (AQL)	0.0 mi	
#010	Meramec River	P	2183	DWS, HHP, IND, IRR, LWW, SCR, WBC-A, WWH (AQL)	0.1 mi	
#011	Meramec River	P	2183	DWS, HHP, IND, IRR, LWW, SCR, WBC-A, WWH (AQL)	0.1 mi	
#012	Meramec River	P	2183	DWS, HHP, IND, IRR, LWW, SCR, WBC-A, WWH (AQL)	0.1 mi	

* The previous permit identified WBID# 3960 and 8-20-13 MUDD Stream; these changes are due to a new numbering system and new naming convention for streams and lakes based on the HUC8 watershed number, the actual receiving stream has not changed.
Classes are representations of hydrologic flow volume or lake basin size per 10 CSR 20-7.031(1)(E).
Designated uses are described in 10 CSR 20-7.031(1)(F), 10 CSR 20-7.031(4), and 10 CSR 20-7.031(6)
WBID: Waterbody Identification Number per 10 CSR 20-7.031(1)(Q) and (S)
HUC: Hydrologic Unit Code https://water.usgs.gov/GIS/huc.html
Water Quality Standards Search https://apps5.mo.gov/mocwis_public/waterQualityStandardsSearch.do

EXISTING WATER QUALITY & IMPAIRMENTS

The receiving waterbody(s) segment(s), upstream, and downstream confluence water quality was reviewed. The USGS https://waterdata.usgs.gov/nwis/sw or the Department's quality data database was reviewed. https://apps5.mo.gov/mocwis_public/wqa/waterbodySearch.do and https://apps5.mo.gov/wqa/ Impaired waterbodies which may be impacted by discharges from this facility were determined. Impairments include waterbodies on the 305(b) or 303(d) list and those waterbodies or watersheds under a TMDL. https://dnr.mo.gov/water/what-were-doing/water-planning/quality-standards-impaired-waters-total-maximum-daily-loads/tmdls Section 303(d) of the federal Clean Water Act requires each state identify waters not meeting water quality standards and for which adequate water pollution controls have not been required. https://dnr.mo.gov/water/what-were-doing/water-planning/quality-standards-impaired-waters-total-maximum-daily-loads/impaired-waters Water quality standards protect beneficial uses of water as provided in 10 CSR 20-7.031. The 303(d) list helps state and federal agencies keep track of impaired waters not addressed by normal water pollution control programs. A TMDL is a calculation of the maximum amount of a given pollutant a water body can absorb before its water quality is affected; hence, the purpose of a TMDL is to determine the pollutant loading a specific waterbody can assimilate without exceeding water quality standards.

- ✓ The Meramec River is listed on the 2016 Missouri 303(d) list for *E. coli* and lead and this facility is not considered a source of or considered to contribute to the impairment.
- ✓ The Mississippi River is associated with the 2006 EPA approved TMDL for PCB and chlordane and this facility is not considered to be a source of or considered to contribute to the impairment.

PART III. RATIONALE AND DERIVATION OF PERMIT CONDITIONS

ANTIBACKSLIDING

Federal antibacksliding requirements [CWA §402(o) and 40 CFR § 122.44(l) https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-122#p-122.44(l) generally prohibit a reissued permit from containing effluent limitations that are less stringent than the previous permit, with some exceptions. All renewed permits are analyzed for evidence of backsliding. There are several express statutory exceptions to the antibacksliding requirements, located in CWA § 402(o)(2) and 40 CFR 122.44(l). Parameters are discussed individually in Part IV of the fact sheet.

- ✓ Removal of an outfall where the facility is no longer discharging wastewater (outfalls #001 and #002) is not considered backsliding; as this is a major facility change per 40 CFR 122.44(l)(2)(i)(A).

✓ Outfalls #007, #008, and #009 no longer contact ash and are non-contact stormwater only therefore removal of sampling is allowed because this is a major change at the facility per 40 CFR 122.44(l)(2)(i)(A). There is no RP at these outfalls.

ANTIDEGRADATION REVIEW

Facilities with new, or expanding flows, the Department is to document, by means of antidegradation review, if the use of a water body's available assimilative capacity is justified. See https://dnr.mo.gov/document-search/antidegradation-implementation-procedure

✓ Not applicable; the facility has ceased discharging from outfalls #001 and #002, and most of the discharge from outfall #006. Outfalls #007, #008, and #009 no longer contact coal ash; these are non-contact stormwater outfalls. The two new stormwater outfalls #011 and #012 are new outfalls only, there will not be more stormwater discharged from the site only a re-routing of the stormwater. Outfall #003 remains, but is now stormwater only however, the basin has not been cleaned out.

BEST MANAGEMENT PRACTICES

Minimum site-wide best management practices are established in this permit to ensure all facilities are managing their sites equally to protect waters of the state from certain activities which could cause negative effects in receiving water bodies. While not all sites require a SWPPP because the SIC codes are specifically exempted in 40 CFR 122.26(b)(14) or 10 CSR 20-6.200(2), these best management practices are not specifically included only for stormwater purposes. These practices are minimum requirements for all industrial sites to protect waters of the state. If the minimum best management practices are not followed, the facility may violate general criteria [10 CSR 20-7.031(4)]. Statutes are applicable to all permitted facilities in the state, therefore pollutants cannot be released unless in accordance with 644.011 and 644.016 (17) RSMo.

CLOSURE

To properly decontaminate and close a wastewater storage structure, treatment structure, lagoon, basin, or device, the facility must draft a complete closure plan, and include the Closure Request Form #2512 https://dnr.mo.gov/document-search/facility-closure-request-form-mo-780-2512 The publication, Wastewater Treatment Plant Closure - PUB2568 found at https://dnr.mo.gov/print/document-search/pub2568 may be helpful to develop the closure plan. The regional office will then approve the closure plan, and provide authorization to begin the work. The regional office contact information can be found here: https://dnr.mo.gov/about-us/division-environmental-quality/regional-office

CHANGES IN DISCHARGES OF TOXIC POLLUTANT

This special condition reiterates the federal rules found in 40 CFR 122.44(f) for technology treatments and 122.42(a)(1) for all other toxic substances. In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "…any pollutant listed as toxic under section 307(a)(1)" or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the clean water act then refers to those parameters listed in 40 CFR 401.15 and any other toxic parameter the Department determines is applicable for reporting under these rules in the permit. The facility must also consider any other toxic pollutant in the discharge as reportable under this condition and must report all increases to the Department as soon as discovered in the effluent. The Department may open the permit to implement any required effluent limits pursuant to CWA §402(k) where sufficient data was not supplied within the application but was supplied at a later date by either the facility or other resource determined to be representative of the discharge, such as sampling by Department personnel.

COAL ASH IMPOUNDMENTS

This section provides an overview of the five coal ash impoundments at the Meramec facility. The facility identified 5 basins requiring closure: MCPA, MCPB, MCPC, MCPD, and MPCE. In all five instances, the facility chose closure in place. MPCA (Pond #492), MCPB (Pond #493), and MCPC (Pond #496) are all historical bottom ash ponds. They house approximately 320,000 cubic yards of ash. MCPD (Pond #498) is a historical fly ash pond housing approximately 460,303 cubic yards of ash. MCPE (Pond #489) is also a fly ash basin; it holds approximately 900,000 cubic yards of ash. A total of approximately 3 million cubic yards of ash are stored at Meramec Energy Center (MEC).

Additional details and permitting decisions relating to these impoundments are found under GROUNDWATER MONITORING and TECHNOLOGY-BASED ASSESSMENT FOR GROUNDWATER INFILTRATION INTO SURFACE WATER. Requirements for the impoundments are included in the permit's special conditions.

Documentation provided by Ameren indicates the chosen remedy, and chosen BAT for this site's ash waste masses is monitored natural attenuation (MNA). https://www.ameren.com/-/media/corporate-site/files/environment/ccr-rule/2019/ccr-remedy-selection-report.ashx

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 facility is not currently under Water Protection Program enforcement action.

DISCHARGE MONITORING REPORTING – ELECTRONIC (EDMR) SUBMISSION SYSTEM
The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by requiring electronic data reporting. To comply with the federal rule, the Department is requiring all facilities to submit discharge monitoring data and reports online. To review historical data, the Department's database has a publicly facing search engine, available at https://apps5.mo.gov/mocwis_public/dmrDisclaimer.do

Registration and other information regarding MoGEM can be found at https://dnr.mo.gov/mogem. Information about the eDMR system can be found at https://dnr.mo.gov/env/wpp/edmr.htm.The first user shall register as an Organization Official and the association to the facility must be approved by the Department. To access the eDMR system, use: https://apps5.mo.gov/mogems/welcome.action For assistance using the eDMR system, contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082. To assist the facility in entering data into the eDMR system, the permit describes limit sets designators in each table in Part A of the permit. Facility personnel will use these identifiers to ensure data entry is being completed appropriately. For example, M for monthly, Q for quarterly, A for annual, and others as identified.

DOMESTIC WASTEWATER, SLUDGE, AND BIOSOLIDS
Domestic wastewater is defined as wastewater originating primarily from the sanitary conveyances of bathrooms and kitchens. Domestic wastewater excludes stormwater, wash water, animal waste, process, or ancillary wastewater.
✓ Not applicable; this facility discharges domestic wastewater to an off-site permitted wastewater treatment facility (POTW).

EFFLUENT LIMITATIONS
Two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs) are reviewed. Permits are required to establish the most stringent or most protective limit per 10 CSR 20-7.015(9)(A) and 40 CFR 122.44(b)(1). Effluent limitations derived and established for this permit are based on current operations of the facility. Any flow through the outfall is considered a discharge and must be sampled and reported as provided in the permit. Daily maximums and monthly averages are required for continuous discharges per 40 CFR 122.45(d)(1). Weekly limits are not available for non-POTWs.

EMERGENCY DISCHARGE
For non-discharging permits, some permits may allow a small amount of wastewater discharge under very specific circumstances.
✓ Not applicable; this permit does not contain conditions allowing emergency discharges. The previous permit required sampling of the unauthorized discharge. The facility may be required by the Regional Office if a report of an unauthorized discharge occurred. Removal of sampling requirements for a non-authorized discharge is not considered backsliding as there was never authorization to discharge.

ENVIRONMENTAL JUSTICE AND TITLE VI OF THE CIVIL RIGHTS ACT OF 1964
The Department has no federal or state statutory or regulatory basis to conduct internally, or require the facility to conduct, any analysis, including cumulative impacts analysis, as a direct result of federal environmental justice policy. Additionally, if the Department acted in such a manner without statutory or regulatory authority, it would further have no basis to articulate the results of that analysis into new or different permit conditions. In short, the Department does not have the authority to establish any Environmental Justice-related conditions as part of the permitting obligation. The Department is expressly prohibited from taking any permitting action based solely on guidance pursuant to 640.023 RSMo; and per 640.016.1 RSMo, is also prohibited from including in permits requirements that are not prescribed or authorized by regulation or statute, unless the requirement, provision, stipulation, or other restriction is pursuant to the authority addressed in statute.

The purpose of an operating permit is to incorporate or otherwise establish all applicable regulatory requirements at the time of permit issuance. The NPDES operating permit identifies, in one document, the regulatory requirements pertaining to discharges of water, to which the facility is subject. The permit's fact sheet enables the State, EPA, the permittee, and the public to better understand those requirements and determine whether the permit's requirements are being met. The NPDES permit does not apply to other regulated areas, such as air or waste materials.

The permit does not and cannot address air pollution or solid waste, and therefore only water concerns are reviewed. There is no basis in law to make adjustments to water permit conditions based upon another media.

Environmental Justice
Environmental justice, is solely federal policy guidance. As discussed above, the Department can only impose permit conditions for which there is basis in statute or regulation. The Department will not violate state law in order to meet the spirit of a federal policy, the Department does not have the regulatory authority to do so.

There are fundamental differences between Title VI, which is applicable federal law, and environmental justice, which is federal policy guidance. As discussed above, the Department can only impose permit conditions for which there is basis in statute or regulation.

Title VI of the Civil Rights Act of 1964
It is important to note that presence of a pollutant does not automatically equate to exposure, risk, harm, disparity, or adversity. The permit review and issuance process are facially neutral actions, and therefore the Title VI analysis must be limited to whether there is adversity or harm, disparity, and causation. The Department used the same permit practice with this permit, as with other permits across the state. This impartiality ensures that this permit's decisions do not have a sufficiently adverse or disparate effect based on race, color, national origin, or sex.

Under Title VI, adversity exists if a fact-specific inquiry determines that the nature, size, or likelihood of the impact is sufficient to make it an actionable harm. The presence of a discharge or a regulated water contaminant source does not automatically equate to harm, much less actionable harm. This operating permit implements the appropriate and relevant requirements under Missouri Clean Water Law.

FEDERAL EFFLUENT LIMITATION GUIDELINES
Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. https://www.ecfr.gov/current/title-40/chapter-I/subchapter-N These are limitations established by the EPA based on the type of activities a facility is conducting. Most ELGs are for process wastewater and some address stormwater. Effluent guidelines are not always established for every pollutant present in a point source discharge. In many instances, EPA promulgates effluent guidelines for an indicator pollutant. Industrial facilities complying with the effluent guidelines for the indicator pollutant will also control other pollutants (e.g. pollutants with a similar chemical structure). For example, EPA may choose to regulate only one of several metals present in the effluent from an industrial category, and compliance with the effluent guidelines will ensure similar metals present in the discharge are adequately controlled. All are technology-based limitations which must be met by the applicable facility at all times. If Reasonable Potential is established for any particular parameter, and water-quality based effluent limits are more protective of the receiving water's quality, the WQBEL will be used as the limiting factor in accordance with 40 CFR 122.44(d) and 10 CSR 20-7.015(9)(A).

- ✓ See also TECHNOLOGY BASED EFFLUENT LIMITATIONS sections below. This facility ceased generating electricity therefore, the only applicable section of 40 CFR 423 is low volume waste sources.

GENERAL CRITERIA CONSIDERATIONS
In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants determined to cause, have reasonable potential to cause, or to contribute to, an excursion above any water quality standard, including narrative water quality criteria. In order to comply with this regulation, permit decisions were made by completing a reasonable potential determination on whether discharges have reasonable potential to cause or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). See Part III REASONABLE POTENTIAL for more information. In instances where reasonable potential exists, the permit includes limitations to address the reasonable potential. In discharges where reasonable potential does not exist, the permit may include monitoring to later determine the discharge's potential to impact the narrative criteria. Additionally, 644.076.1 RSMo, as well as Part I §D – Administrative Requirements of Standard Conditions included in this permit state it shall be unlawful for any person to cause or allow any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of §§644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule, or regulation promulgated by the commission. See Part IV for specific determinations.

GOOD HOUSEKEEPING PRACTICES
Good housekeeping is a practical, cost-effective way to maintain a clean and orderly facility to prevent potential pollution sources from coming into contact with stormwater. It includes establishing protocols to reduce the possibility of mishandling materials or equipment and employee training. Common areas where good housekeeping practices should be followed include trash containers and adjacent areas, material storage areas, vehicle and equipment maintenance areas, and loading docks. Good housekeeping practices must include a schedule for regular pickup and disposal of garbage and waste materials and routine inspections of drums, tanks, and containers for leaks and structural conditions. Practices also include containing and covering garbage, waste materials, and debris. Involving employees in routine monitoring of housekeeping practices is an effective means of ensuring the continued implementation of these measures.

Specific good housekeeping may include:
- ◆ Spill and overflow protection under chemical or fuel connectors to contain spillage at liquid storage tanks
- ◆ Load covers on residue hauling vehicles and ensure gates on trucks are sealed and the truck body is in good condition
- ◆ Containment curbs around loading/unloading areas or tanks
- ◆ Techniques to reduce solids residue which may be tracked on to access roads traveled by residue trucks or residue handling vehicles.
- ◆ Techniques to reduce solid residue on exit roads leading into and out of residue handling areas

Where feasible, minimizing exposure of potential pollutant sources to precipitation is an important control option. Minimizing exposure prevents pollutants, including debris, from coming into contact with precipitation and can reduce the need for BMPs to treat contaminated stormwater runoff. It can also prevent debris from being picked up by stormwater and carried into drains and surface waters. Examples of BMPs for exposure minimization include covering materials or activities with temporary structures (e.g., tarps)

when wet weather is expected or moving materials or activities to existing or new permanent structures (e.g., buildings, silos, sheds). Even the simple practice of keeping a dumpster lid closed can be a very effective pollution prevention measure. For erosion and sediment control, BMPs must be selected and implemented to limit erosion on areas of your site that, due to topography, activities, soils, cover, materials, or other factors, are likely to experience erosion. Erosion control BMPs such as seeding, mulching, and sodding prevent soil from becoming dislodged and should be considered first. Sediment control BMPs such as silt fences, sediment ponds, and stabilized entrances trap sediment after it has eroded. Sediment control BMPs should be used to back-up erosion control BMPs.

The SWPPP (required for this facility) must contain a narrative evaluation of the appropriateness of stormwater management practices that divert, infiltrate, reuse, or otherwise manage stormwater runoff so as to reduce the discharge of pollutants. Appropriate measures are highly site-specific, but may include, among others, vegetative swales, collection and reuse of stormwater, inlet controls, snow management, infiltration devices, and wet retention measures. A combination of preventive and treatment BMPs will yield the most effective stormwater management for minimizing the offsite discharge of pollutants via stormwater runoff. BMPs schedules must also address preventive maintenance records or logbooks, regular facility inspections, spill prevention and response, and employee training.

GROUNDWATER MONITORING

Groundwater is a water of the state according to 644.016(27) RSMo, is subject to regulations at 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6), and must be protected accordingly.

- ✓ This facility is monitoring the groundwater at the site because coal ash has been left in place. See background information under COAL ASH IMPOUNDMENTS above.

While the state does not have explicit requirements pertaining to groundwater monitoring for coal-fired power plant facilities, groundwater is considered a "water of the state" and therefore, it is within the department's authority to consider groundwater when issuing permits. Both lined and unlined ash ponds will be evaluated to determine potential impacts to groundwater. As additional permits for coal-fired power plants with surface impoundments for CCR's are renewed, all will be evaluated for the need for similar requirements and further characterization of the ash ponds and their toxicity. Much of the information about leachates entering groundwater is obtained from the department’s Solid Waste Management Program (10 CSR 80-11.010) for utility waste landfills and documents authored by the EPA and the Electric Power Research Institute (EPRI).

The adequacy of a groundwater monitoring program depends greatly on the quality of the detailed hydrogeologic site characterization used to design the program. Only after a complete understanding of the underlying geology and hydrology has been achieved, can the implementation of a groundwater monitoring program begin. The time schedule provided in the last permit was to provide time for the utility company, their consultants, and the Department to evaluate and develop a groundwater monitoring plan which is correct for the site-specific conditions of each coal ash pond. This renewal reviews the data collected over the last permit term.

The facility was required to submit several reports under the last permit; these reports were received and reviewed.

Report Name	Received	MGS Report #
Site Characterization Workplan	June 29, 2018	MIS19014
Site Characterization Report	April 1, 2020	MIS20073
Groundwater Monitoring Sampling and Analysis Plan (Draft)	July 1, 2020	MIS21044
Groundwater Monitoring Sampling and Analysis Plan (Final)	January 1, 2020	MIS21051

All reports were received on time. The Missouri Geological Survey (MGS) reviewed each report and provided feedback under an MIS report. These reported are copied into the APPENDICES chapter of the fact sheet, just before Part IV below.

Ameren established nine monitoring wells under the state groundwater monitoring program AMW-1 through AMW-9. Ameren also established a separate groundwater monitoring network for the 40 CFR 257 §D. All data collected was reviewed for numeric groundwater compliance under Missouri Groundwater Quality Standards. (GWQS). GWQS are listed in 10 CSR 20-7.031, Table A1.

Ameren established nine monitoring wells under the state groundwater monitoring program AMW-1 through AMW-9. Two years of quarterly data supplied during the last permit term and at renewal for AMW-1 through AMW-9 was placed into a spreadsheet to determine reasonable potential in groundwater, and in groundwater to surface water. Data was aggregated from all wells for each parameter. See REASONABLE POTENTIAL (RP) section below. The Department also reviewed the online groundwater reports for the most recent two years, 2021 and 2022. Of this data, fluoride and radium 226+226 was input into the Department’s Water Quality Reasonable Potential calculator as these parameters were not collected under the Department’s groundwater monitoring program. Of the parameters applicable for this site, boron has RP in groundwater. This permit provides an SOC to meet boron limits in GW. One parameter, boron, was identified as having RP from groundwater into surface water. The Department utilized the Meramec River mixing; the Meramec River is the more stringent mixing consideration; the Mississippi River also is expected to receive groundwater from the ash mass. Both rivers are authorized to receive groundwater from the ash waste mass.

Missouri does not have GW protection standards (PS) for some pollutants listed in 40 CFR 257 Subpart D Appendix III or IV (referenced as “§D”, for brevity; see additional information under COAL ASH IMPOUNDMENTS above). These include pH, total

dissolved solids (TDS), calcium, chloride, lithium, molybdenum, potassium, and sodium; these parameters therefore have no RP in GW as there are no established WQS.

Iron and Manganese are ubiquitous naturally occurring elements. While Missouri has GWPS for these two elements, the Department has determined that applying limits to these parameters to be outside of the requirements necessary to protect waters of the state, and therefore not required to be limited by the permit. When measuring compliance with GWQS in a medium which already has copious amounts of the parameter, the onus of protection under Missouri Clean Water Law (MCWL) diminishes when the source of the pollutants is not from the facility actions. Neither iron nor manganese are pollutants of concern associated with deposition of coal ash.

The facility samples the groundwater under §D and puts the data online annually; the Department will use this information during next permit renewal to determine compliance with MO GW WQS.

ICE-MELT PRODUCT REMOVAL
The Department is authorized to require BMPs for facilities per 40 CFR 122.44(k)(2). The facility should, to the extent practicable, remove large pieces of salt as soon as possible. After winter weather has ceased for the year, the facility needs to inspect all low-lying areas for extra salt and sand and remove these as soon as possible. Salt applied to large areas has the potential to cause freshwater salinization which could result in a fish kill of sensitive species. To reduce potential for solids entering a stream, sand or other traction control materials will need to be evaluated against the probability that these materials could cause general criteria violations of solids and bottom deposits per 10 CSR 20-7.031(4).

IMPINGEMENT AND ENTRAINMENT AT CWIS—CWA § 316(b):
The Clean Water Act Section 316(b) provides for protection of aquatic life from cooling water intake structures (CWIS) where the facility withdraws more than 2 MGD.
- ✓ Since last permit renewal, the facility has ceased generating electricity therefore 40 CFR 122.21(r) was not required to be submitted. This permit specifically prohibits the use of the intake structures for cooling purposes.

LAND APPLICATION
Land application, which is surficial dispersion of wastewater or surficial spreading of sludge can be performed by facilities as an alternative to discharging. Authority to regulate these activities is pursuant to 644.026 RSMo. The Department implements requirements for these types of operations pursuant to 10 CSR 20-6.015(4)(A)1 which instructs the Department to develop permit conditions containing limitations, monitoring, reporting, and other requirements to protect soils, crops, surface waters, groundwater, public health, and the environment. Sub-surface dispersion or application of wastewater is typically considered a Class V UIC system; See UNDERGROUND INJECTION CONTROL section below.
- ✓ Not applicable; this permit does not authorize operation of a surficial land application system to disperse wastewater or sludge.

LAND DISTURBANCE
Land disturbance, sometimes called construction activities, are actions which cause disturbance of the root layer or soil; these include clearing, grading, and excavating of the land. 40 CFR 122.26(b)(14) and 10 CSR 20-6.200(3) requires permit coverage for these activities. Coverage is not required for facilities when only providing maintenance of original line and grade, hydraulic capacity, or to continue the original purpose of the facility.
- ✓ Not applicable; this permit does not provide coverage for land disturbance activities. The facility may obtain a separate land disturbance permit (MORA) online at https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/stormwater/construction-land-disturbance MORA permits may not cover disturbance of contaminated soils, however, site specific permits such as this one can be modified to include appropriate controls for land disturbance of contaminated soils by adding site-specific BMP requirements and additional outfalls.

MODIFICATION REQUESTS
Facilities have the option to request a permit modification from the Department at any time under RSMo 644.051.9. Requests must be submitted to the Water Protection Program with the appropriate forms and fees paid per 10 CSR 20-6.011. It is recommended facilities contact the program early so the correct forms and fees are submitted, and the modification request can be completed in a timely fashion. Minor modifications, found in 40 CFR 122.63, are processed without the need for a public comment period. Major modifications, those requests not explicitly fitting under 40 CFR 122.63, do require a public notice period. Modifications to permits must be completed when: a new pollutant is found in the discharge; operational or functional changes occur which affect the technology, function, or outcome of treatment; the facility desires alternate numeric benchmarks; or other changes are needed to the permit.

Modifications are not required when utilizing or changing additives in accordance with the publication https://dnr.mo.gov/document-search/additive-usage-wastewater-treatment-facilities-pub2653/pub2653 nor are required when a temporary change or provisional discharge has been authorized by the regional office. While provisional discharges may be authorized by the regional office, they will not be granted for more than the time necessary for the facility to obtain an official modification from the Water Protection Program. Temporary provisional discharges due to weather events or other unforeseen circumstances may or may not necessitate a permit

modification. The facility may ask for a Compliance Assistance Visit (CAV) from the regional office to assist in the decision-making process; CAVs are provided free to the permitted entity.

NUTRIENT MONITORING

Nutrient monitoring is required for facilities characteristically or expected to discharge nutrients (nitrogenous compounds and/or phosphorus) when the design flow is equal to or greater than 0.1 MGD per 10 CSR 20-7.015(9)(D)8. This requirement is applicable to all Missouri waterways.

✓ Nutrient monitoring does not apply to stormwater only.

OIL/WATER SEPARATOR SYSTEMS AND USED OIL

Oil water separator (OWS) systems are frequently found at industrial sites where process water, wastewater, or stormwater may contain oils, petroleum, greases, oily wastewaters, or other immiscible liquids requiring separation. Food industry discharges typically require treatment prior to discharge to publicly owned treatment works. Per 10 CSR 26-2.010(2)(B), all oil water separators classified as underground storage tanks (UST) which meet the volume requirements, must be operated according to manufacturer's specifications. OWS which are USTs may be authorized in NPDES permits per 10 CSR 26-2.010(2)(B) or otherwise will be regulated as a underground petroleum storage tank under tank rules. A facility may operate an OWS which is not considered a UST for the wastewater or stormwater at any facility without specific NPDES permit authorization. Alternatively, a facility is not required to cover a UST OWS under the NPDES permit if they desire to obtain alternative regulatory compliance. OWS treating animal, vegetable, or food grade oils are not required to be authorized under 10 CSR 20-26-2.020(2)(B). All best management practices for all OWS systems must be adhered. In 2017, field-poured concrete tanks, previously exempted from the tanks rules, lost their exempt status. Facilities must re-evaluate these concrete structures pursuant to these now relevant rules. Adjacent USTs are not covered by these regulations.

Any and all water treatment systems designed to remove floating immiscible oils are termed oil water separators. If a device is intended to capture oil and separate it from water which is to be discharged, this generally qualifies that oil as used oil (if it is petroleum-based in nature). Used oil and oily sludge must be disposed of in accordance with 10 CSR 25-11.279. Pursuant to 40 CFR 279.20(b)(2)(ii)(B), separating used petroleum-based oil from wastewater generated on-site (to make the wastewater acceptable for discharge or reuse pursuant to Federal or state regulations governing the management or discharge of wastewaters) are considered used oil generators and not processors under self-implementing 40 CFR 279 Standards For The Management Of Used Oil. Oily wastes generated by OWS are also generally subject to Spill Prevention, Control, and Countermeasure (SPCC) regulations.

PERMIT SHIELD

The permit shield provision of the Clean Water Act (Section 402(k)) and Missouri Clean Water Law (644.051.16 RSMo) provides that when a permit holder is in compliance with its NPDES permit or MSOP, it is effectively in compliance with certain sections of the Clean Water Act, and equivalent sections of the Missouri Clean Water Law. In general, the permit shield is a legal defense against certain enforcement actions but is only available when the facility is in compliance with its permit and satisfies other specific conditions, including having completely disclosed all discharges and all facility processes and activities to the Department at time of application. It is the facility's responsibility to ensure that all potential pollutants, waste streams, discharges, and activities, as well as wastewater land application, storage, and treatment areas, are all fully disclosed to the Department at the time of application or during the draft permit review process. Previous permit applications are not necessarily evaluated or considered during permit renewal actions. All relevant disclosures must be provided with each permit application, including renewal applications, even when the same information was previously disclosed in a past permit application. Subsequent requests for authorization to discharge additional pollutants, expanded or newly disclosed flows, or for authorization for previously unpermitted and undisclosed activities or discharges, will likely require an official permit modification, including another public participation process.

REASONABLE POTENTIAL (RP)

Regulations per 10 CSR 20-7.015(9)(A)2 and 40 CFR 122.44(d)(1)(i) require effluent limitations for all pollutants which are (or may be) discharged at a level causing or have the reasonable potential to cause (or contribute to) an in-stream excursion above narrative or numeric water quality standards. Per 10 CSR 20-7.031(4), general criteria shall be applicable to all waters of the state at all times; however, acute toxicity criteria may be exceeded by permit allowance in zones of initial dilution, and chronic toxicity criteria may be exceeded by permit allowance in mixing zones. A reasonable potential analysis (RPA) is a numeric RP decision calculated using effluent data provided by the facility for parameters that have a numeric Water Quality Standard (WQS). If any given pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the WQS, the permit must contain a WQBEL for the pollutant per 40 CFR Part 122.44(d)(1)(iii) and the most stringent limits per 10 CSR 20-7.031(9)(A). The RPA is performed using the *Technical Support Document for Water Quality Based Toxics Control (TSD)* methods (EPA/505/2-90-001) for continuous discharges. See additional considerations under Part II WATERBODY MIXING CONSIDERATIONS and Part III WASTELOAD ALLOCATIONS. Wasteload allocations are determined utilizing the same equations and statistical methodology. Absent sufficient effluent data, WQBELs are derived without consideration of effluent variability and is assumed to be present unless found to be absent to meet the requirements of antidegradation review found in 10 CSR 20-7.031(3) and reporting of toxic substances pursuant to 40 CFR 122.44(f). The Department's permit writer's manual (https://dnr.mo.gov/water/business-industry-other-entities/technical-assistance-guidance/wastewater-permit-writers-manual), the EPA's permit writer's manual (https://www.epa.gov/npdes/npdes-permit-writers-

manual), program policies, and best professional judgment guide each decision. Each parameter in each outfall is carefully considered; and all applicable information regarding: technology based effluent limitations, effluent limitation guidelines, water quality standards, inspection reports, stream water quality information, stream flows, uses assigned to each waterbody, and all applicable site specific information and data gathered by the facility through discharge monitoring reports and renewal (or new) application sampling.

Reasonable potential determinations (RPD) are based on physical conditions of the site as provided in Sections 3.1.2, 3.1.3, and 3.2 of the TSD using best professional judgement. An RPD consists of evaluating visual observations for compliance with narrative criteria, non-numeric information, or small amounts of numerical data (such as 1 data point supplied in the application). Narrative criteria with RP typically translate to a numeric WQS, so a parameter's establishment being based on narrative criteria does not necessarily make the decision an RPD vs RP—how the data is collected does, however. For example, a facility with orange discharge can have RP for narrative criteria like color, but a numeric iron limit is established to account for the violation of narrative criteria based on effluent data submitted by the facility. When insufficient data is received to make a determination on RP based on numeric effluent data, the RPD decisions are based on best professional judgment considering the type of effluent discharged, the current operational controls in place, and historical overall management of the site. In the case of iron causing excursions of narrative criteria for color, if a facility has not had iron monitoring in a previous permit, adding iron monitoring would be an RPD, since numeric data isn't being used in the determination, but observable, site-specific conditions are.

When the facility is performing surficial or subsurface land application, the volume of water, frequency of application, type of vegetation, soil type, land slopes, and general overall operating conditions are considered. 10 CSR 20-8 are regulations for the minimum operating conditions for land application; these regulations cannot be excused even if there is no RP. RP is reserved for discharging outfalls given that these outfalls are the only ones which water quality standards apply to, but the process is similar as the site conditions are compared to regulations, soil sampling, pollutant profile, and other site-specific conditions. In the case of non-discharging outfalls, an RPD is instead used to determine monitoring requirements.

The TSD RPA method cannot be performed on stormwater as the flow is intermittent and highly variable. A stormwater RPD consists of reviewing application data and discharge monitoring data and comparing those data to narrative or numeric water quality criteria. For stormwater outfalls, considerations are required per 10 CSR 20-6.200(6)(B)2: A. application and other information supplied by the facility; B. effluent guidelines; C. best professional judgment; D. water quality; and E. BMPs.

RPDs are also performed for WET testing in wastewater. While no WET regulations specific to industrial wastewater exist, 40 CFR 122.21(j)(5) implies the following can be considered: 1) the variability of the pollutants; 2) the ratio of wastewater flow to receiving stream flow; and 3) current technology employed to remove toxic pollutants. Generally, sufficient data does not exist to mathematically determine RPA for WET, but instead compares the data for other toxic parameters in the wastewater with the necessity to implement WET testing with either monitoring or limits. When toxic parameters exhibit RP, WET testing is generally included in the permit as an RPD. However, if all toxic parameters are controlled via limitations or have exhibited no toxicity in the past, then WET testing may be waived. Only in instances where the wastewater is well characterized can WET testing be waived.

WET testing is typically not implemented for stormwater. Stormwater discharges do not adhere to the same principles of wastewater RPAs because stormwater discharges are not continuous, and at the time of precipitation discharge the receiving stream is also no longer at base (0) flow, meaning that using RP to develop WET testing requirements for stormwater is unrepresentative. The Department works with the Missouri Department of Conservation and has understanding of streams already exhibiting toxicity, even without the influence of industrial wastewater or stormwater. Facilities discharging to streams with historical toxicity are required to use laboratory water for dilution, instead of water from the receiving stream when performing WET tests. In general, removal of a WQBEL if there is no RP is not considered backsliding, see Antibacksliding for additional information.

- ✓ In a meeting on February 17, 2023, the EPA verbally agreed that removal of limits for a parameter with no RP is not considered backsliding.
- ✓ The previous permit indicated "There Shall Be No Discharge of Floating Solids or Visible Foam in Other Than Trace Amounts" under each table. The statement was not evaluated against actual site conditions therefore, this general criterion was re-assessed. It was determined that this facility does not discharge solids or foam in amounts which would indicate reasonable potential, therefore the statement was removed. Removal of these narrative criteria is not subject to antibacksliding provisions as there is no RP.
- ✓ Groundwater RP was determined on a 1:1 basis; if the groundwater monitoring value is above the groundwater quality standard, there is reasonable potential. No multipliers were used. Boron has RP in groundwater.
- ✓ A more detailed version including calculations of this RPA is available upon request.
- ✓ For groundwater into surface water, mixing is afforded, see low flow values below. While the Mississippi River also has mixing considerations, the Meramec River mixing is more protective.

Receiving Stream	Low-Flow Values (CFS)			Zone of Initial Dilution (CFS) [10 CSR 20-7.031(5)(A)4.B.(II)(b)]			Mixing Zone (CFS) [10 CSR 20-7.031(5)(A)4.B.(II)(a)]		
	1Q10	7Q10	30Q10	1Q10	7Q10	30Q10	1Q10	7Q10	30Q10
Meramec River (P)	388	409	457	9.7	10.2	11.4	97	102.3	114.3

Data were obtained using the USGS tool StreamStats at https://streamstats.usgs.gov/ss/

NUMERIC REASONABLE POTENTIAL ANALYSIS

Groundwater Only (GW) and Groundwater to Surface Water:

Parameter:	Units	CMC Acute	CCC Chronic	Listing	Daily Max	Monthly Average	n#	CV	n Min	n Max	MF	RWC Acute	RWC Chronic	RP
Aluminum (Al)	µg/L	750	n/a	AQL	8,250	3,127	47	1.127	26.1	1160	2.49	262.1	21.6	No
Antimony (Sb)	µg/L	n/a	6	GW	-	6	3	0.600	1	1.6	1.25	2.0	2.0	No
Arsenic (As)	µg/L	340	150	AQL	3,740	1,471	54	1.021	1.3	24.8	2.20	5.0	0.4	No
Arsenic (As)	µg/L	n/a	100	IRR	24,387	9,595	54	1.021	1.3	24.8	2.20	5.0	0.4	No
Barium (Ba)	µg/L	n/a	2000	IRR	460,566	209,118	61	0.733	28.4	558	1.77	89.8	7.4	No
Barium (Ba) - GW	µg/L	n/a	2000	GW	-	2000	61	0.733	28.4	558	1.25	697.5	697.5	No
Beryllium (Be) - GW	µg/L	n/a	4	GW	-	4	0	0.600	0	0	1.25	0	0	No
Boron (B)	µg/L	n/a	2000	IRR, LWP	482,277	196,928	61	0.932	45.1	30700	1.99	5554.0	458.8	No
Boron (B) - GW	µg/L	n/a	2000	GW	-	2000	61	0.932	45.1	30700	1.25	38375.0	38375.0	Yes
Chloride	mg/L	860	230	AQL	9,460	3,908	61	0.907	5	222	1.96	39.6	3.3	No
Chloride + Sulfate	mg/L	1000	n/a	AQL	11,000	3,237	768	4.229	0	1289	0.73	85.0	85.0	No
Chromium III	µg/L	3284.96	157.02	AQL	34,350	17,122	9	0.600	1.6	3.6	3.16	1.0	0.1	No
Chromium	µg/L	n/a	100.00	IRR	21,876	10,904	9	0.600	1.6	3.6	3.16	1.0	0.1	No
Cobalt (Co)	µg/L	n/a	1000	IRR, LWP	238,260	100,443	12	0.865	1.1	13.5	4.00	4.9	0.4	No
Cobalt (Co) - GW	µg/L	n/a	1000	GW	-	1000	12	0.865	1.1	13.5	1.25	16.9	0.0	No
Copper (Cu)	µg/L	27.90	17.44	AQL	307	123	39	0.985	1	12.2	2.49	2.8	0.2	No
Fluoride (F-)	mg/L	n/a	4	DWS	736	477	28	0.324	0.11	0.46	1.51	0.1	0.0	No
Fluoride (F-) - GW	mg/L	n/a	4	GW	-	4	28	0.324	0.11	0.46	1.00	0.5	0.5	No
Iron (Fe)	µg/L	n/a	1000	AQL	244,299	95,448	61	1.040	39.3	47700	2.11	9133.0	754.4	No
Lead (Pb)	µg/L	207.31	8.08	AQL	1,768	881	5	0.600	1	2	4.19	0.8	0.1	No
Lead (Pb) - GW	µg/L	n/a	15.00	GW	25	12	5	0.600	1	2	1.25	2.5	2.5	No
Mercury (Hg)	µg/L	1.65	0.8	AQL	18	9	0	0.600	0	0	1.00	0	0	No
Mercury (Hg) - GW	µg/L	n/a	2.0	GW	-	2	0	0.600	0	0	1.25	0	0	No
Nickel (Ni)	µg/L	872.36	96.93	AQL	9,596	3,914	48	0.935	1.1	23.8	2.20	4.8	0.4	No
Nickel - GW	µg/L	n/a	100.00	GW	24,107	9,851	49	0.930	1.1	23.8	2.17	4.7	0.4	No
Radium 226+228	pCi/L	n/a	5	ALL	8	4	6	0.600	1.081	1.979	1.25	2.5	2.5	No
Selenium (Se)	µg/L	n/a	5	AQL	1,195	500	11	0.882	2.6	36.6	4.29	14.3	1.2	No
Selenium (Se) - GW	µg/L	n/a	50	GW	-	50	11	0.882	2.6	36.6	1.25	45.75	45.75	No
Silver (Ag)	µg/L	13.36	n/a	AQL	147	73	4	0.600	1	4.5	4.74	1.9	0.2	No
Sulfate	mg/L	n/a	250.00	DWS	65,513	28,594	61	0.800	13	1210	1.84	202.8	15.0	No
Thallium (Tl)	µg/L	n/a	6.3	HHP	1,879	767	4	0.600	2.5	3.4	4.74	1.5	0.1	No
Zinc (Zn)	µg/L	223.31	221.49	AQL	2,456	1,224	2	0.600	26.6	33.3	7.39	22.4	1.8	No

n/a	Not Applicable
n	number of samples; if the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent.
CV	Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the mean of the same sample set.
CCC	continuous chronic concentration
CMC	continuous maximum concentration
RWC	Receiving Water Concentration: concentration of a toxicant or the parameter in the receiving water after mixing (if applicable)
MF	Multiplying Factor; 99% confidence level and 99% probability basis. The MF is set to 1.25 for groundwater. This number was chosen to be slightly overprotective of GW use.
0 n#	The table shows 0 n# when the facility sampled for the parameter but all results were non-detect.
RP	Reasonable Potential: an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).
DW	Drinking water standards are only applicable on streams which have the designated use assigned. Per 10 CSR 20-7.031(5) Protection of drinking water supply is limited to surface waters designated for raw drinking water supply and aquifers. Per 10 CSR 20-7.031(1)(F)6. Drinking water supply (DWS) Maintenance of a raw water supply which will yield potable water **after treatment** by public water treatment facilities; Therefore, mixing is allowed for the DWS use.
ALL	All radionuclide discharges must meet drinking water criteria per 10 CSR 20-7.031(5)(I).

REGIONAL OFFICES (ROS)

Regional Offices will provide a compliance assistance visit at a facility's request; a regional map with links to phone numbers can be found here: https://dnr.mo.gov/about-us/division-environmental-quality/regional-office. Or use https://dnr.mo.gov/compliance-assistance-enforcement to request assistance from the Region online.

RENEWAL REQUIREMENTS

The renewal special condition permit requirement is designed to guide the facility to prepare and include all relevant and applicable information in accordance with 10 CSR 20-6.010(7)(A)-(C), and if applicable, federal regulations. The special condition may not include all requirements and requests for additional information may be made at the time of permit renewal under 644.051.13(5)

RSMo and 40 CFR 122.21(h). Prior to submittal, the facility must review the entire submittal to confirm all required information and data is provided; it is the facility's responsibility to discern if additional information is required. Failure to fully disclose applicable information with the application or application addendums may result in a permit revocation per 10 CSR 20-6.010(8)(A) and may result in the forfeiture of permit shield protection authorized in 644.051.16 RSMo. Forms are located at: https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/wastewater

- ✓ This facility shall submit an appropriate and complete application to the Department no less than 180 days prior to the expiration date listed on page 1 of the permit.
- ✓ The facility may email cleanwaterpermits@dnr.mo.gov to submit the application to the Program. A paper copy is not necessary if submitted via email. For larger applications, a drop-box type service may also be used.
- ✓ Application materials shall include complete Form A, and Form C. The facility may need to submit Form D for categorical wastewater discharges if any exist at the time of renewal.

SAMPLING FREQUENCY JUSTIFICATION

Sampling and reporting frequency was generally retained from previous permit. 40 CFR 122.45(d)(1) indicates all continuous discharges, such as wastewater discharges, shall be permitted with daily maximum and monthly average limits. Minimum sampling frequency for all parameters is annually per 40 CFR 122.44(i)(2).

A reduction in monitoring frequency is not considered backsliding. A numeric or narrative limit established in the permit is applicable every hour of every day, not only during the day the monitoring occurs, therefore, a reduction in monitoring frequency has no bearing on the numeric limits applied in the permit. Both § 402(o)(1) and the safety clause in § 402(o)(3) prohibit renewed permits from containing effluent limitations that are less stringent. The Department does not read 402(o) to apply to any other non-limiting type of permit conditions.

- ✓ The previous permit required sampling for outfalls #001 and #002; the sampling requirements are removed as there is no longer a wastewater discharge from these outfalls.

SAMPLING TYPE JUSTIFICATION

Sampling type was continued from the previous permit. The sampling types are representative of the discharges and are protective of water quality. Discharges with altering effluent will consider implementing composite sampling; discharges with uniform effluent can have grab samples. Grab samples are usually appropriate for stormwater. Parameters which must have grab sampling are: pH, ammonia, *E. coli*, total residual chlorine, free available chlorine, hexavalent chromium, dissolved oxygen, total phosphorus, volatile organic compounds, and others. For further information on sampling and testing methods see 10 CSR 20-7.015(9)(D)2.

SCHEDULE OF COMPLIANCE (SOC)

A schedule of compliance is time allowed to meet future more stringent limitations. The SOC can also be remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, effluent limits, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and the terms and conditions of an operating permit. SOCs are allowed under 40 CFR 122.47 and 10 CSR 20-7.031(11) providing certain conditions are met.
An SOC is not allowed:

- For effluent limitations based on technology-based standards established in accordance with federal requirements, if the deadline for compliance established in federal regulations has passed in accordance with 40 CFR 125.3.
- For a newly constructed facility in most cases per 644.029 RSMo. Newly constructed facilities must meet all applicable effluent limitations (technology and water quality) when discharge begins. New facilities are required to install the appropriate control technologies as specified in a permit or antidegradation review. A SOC is allowed for a new water quality based effluent limit not included in a previously public noticed permit or antidegradation review, which may occur if a regulation changes during construction.
- To develop a TMDL, UAA, or other study associated with development of a site-specific criterion. A facility is not prohibited from conducting these activities, but a SOC may not be specifically granted for conducting these activities.

In order to provide guidance in developing SOCs, and to attain a greater level of consistency, the Department issued a policy on development of SOCs on October 25, 2012. The policy provides guidance for standard time frames for schedules for common activities, and guidance on factors to modify the length of the schedule.

- ✓ Applicable; the time given for WQBELs in this permit listed under Interim Effluent Limitations and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(11)]. The facility has been given a schedule of compliance to meet final WQBEL(s). Time is necessary for the facility to determine methods to comply with WQS. See permit Sections A and B for compliance dates.
- ✓ Five years were provided to meet the GW WQS requirements. The company has not determined a method of compliance with the GWQS at this time.

SECONDARY CONTAINMENT:

The Department has established minimum requirements for secondary containment areas. These conditions are necessary to prevent contamination in stormwater before storm events, and before stormwater has a risk for contamination in these areas. By including dry inspection requirements, the Department can be confident in the site's operational controls. By fixing all leaks and removing debris

from the secondary containment areas prior to precipitation events, stormwater collected in the areas are unlikely to yield contamination or elicit sheen thereby allowing immediate removal of stormwater which is in compliance with SPCC plans.

The Department is establishing a permit requirement for visual inspection frequency commiserate with the potential for contamination for secondary containment(s) to protect waters of the state from petroleum contamination, oils and greases, or sheen pursuant to 10 CSR 20-7.031(4)(B); and other water contaminants as necessary. These conditions establish permissible allowances for the facility to discharge stormwater that was either free of sheen or has been cleaned of sheen, but only if the facility has demonstrated, through inspections, the facility has been effectively maintaining tanks and appurtenances in the secondary containment areas.

Historic petroleum secondary containment language required laboratory testing for benzene, toluene, ethylbenzene, and xylene (BTEX) upon sheen observance; to have all laboratory testing completed prior to release of the contained stormwater; and to be below established numeric limits for BTEX prior to release. However, it was noted by commenters that when the Department requires facilities to keep the sheeny accumulated stormwater in the secondary containment for long periods of time (time needed to obtain laboratory results for BTEX, it is contrary to other relevant regulations, which state contaminated stormwater must be disposed of as quickly as possible. Facilities then developed alternative actions, such as tanking sheeny secondary containment stormwater until the expedited BTEX laboratory analysis was completed, then releasing the water from the tank. These alternative methods of tanking sheeny stormwater are both costly and resource-intensive, requiring worker time which needs to be directed to other facility activities. By shifting worker time from post-sheen-occurrence management to pre-contamination dry-inspections, the Department has alleviated several commenter's concerns regarding past secondary containment special conditions.

By allowing on-site sheen removal, then discharge, the Department is allowing expedited drainage of the secondary containment without delay. When a facility properly maintains tanks and appurtenances via these series of inspections and provides sheen removal prior to release, then the facility can maintain compliance with Missouri's requirements for the safe storage and handling of flammable and combustible liquids (2 CSR 90-30.050), storage tank secondary containment volume requirements (40 CFR 112), and Missouri's general water quality criteria 10 CSR 20-7.031(4)(B).

The Department revised petroleum secondary containment special conditions in permits based on National Fire Protection Association (NFPA) standards [mainly NFPA 30], enforceable under Missouri fire prevention codes [2 CSR 90-30.050], and Spill Prevention, Control, and Countermeasure (SPCC) [40 CFR 112] requirements. 2 CSR 90-30.050(20) and (21) specifically reference the Department of Natural Resources' environmental regulations. To apply these referenced conditions, this permit requires periodic secondary containment inspections.

It is acceptable for the inspections this permit requires to contradict the facility's SPCC plan inspection frequency, as these two requirements have different goals; the frequencies designated in the SPCC plan are based on the facility's evaluation of a tankage system's potential for catastrophic failure, not small leaks that result in sheeny stormwater. The inspection frequency this permit identifies for secondary containments have the capability to identify small leaks from appurtenances which have the possibility to cause contamination in standing stormwater, not simply a catastrophic failure. SPCC requirements pursuant to 40 CFR 112.8(c)(3)(iv) and 40 CFR 112.12(c)(3)(iv) also dictate that release of contaminated stormwater is prohibited unless regulated under an NPDES permit which allows for bypassing pursuant to 40 CFR 122.41(m)(3). As this permit does not allow bypassing, the facility must follow the inspection steps listed in the special conditions of this permit.

Many facilities are subject to the requirements outlined by the EPA in 40 CFR 112.3, also known as the SPCC plan: detailing the equipment, workforce, procedures, and steps necessary to prevent, control, and provide adequate countermeasures to a discharge. These regulations minimally require secondary containment and diversion structures be maintained. Title 40 regulations are developed by the Environmental Protection Agency. The self-certified SPCC plan a facility designs, while aimed to protect waters of the state and United States (WOTS/WOTUS), may differ considerably from site to site. This permit's conditions serve to treat similar facilities similarly. The EPA did not establish minimum frequency container or containment inspections; this permit does establish a minimum frequency, and concurrent inspections for this permit and per the SPCC plan may occur. This permit does not require a professional engineer (PE) inspect the tankage systems.

- ✓ Numerous oil filled transformers are located on site. The oil is used for cooling and insulation and are generally grouped by size. Upon ceasing operations at the Energy Center all the oil filled equipment not in use will be drained of oil during the decommissioning process.
- ✓ A total of fourteen stalls along the north side of the plant. Thirteen contain large power transformers. One additional stall contains five oil storage tanks. Two of the tanks store transformer oil, two store clean oil circuit breaker (OCB) oil, and one stores used OCB oil. The transformers contain a total of approximately 81,000 gallons of oil. The five storage tanks have a maximum capacity of 32,000 gallons. A rock filled pit is present below each stall which is designed to contain any oil lost. These pits are tied together and discharge through a common line to a dedicated containment pond.
- ✓ A second group of electrical equipment is located within the plant substation. It contains 19 OCBs and 12 instrument potential transformers. In the substation the ground is covered with a 7-inch layer of chat. An oil spill could be expected to be contained within the substation area as there are no drains. The last group of electrical equipment consists of numerous transformers associated with the electrostatic precipitators located on the south side of the plant.

SPILLS, OVERFLOWS, AND OTHER UNAUTHORIZED DISCHARGE REPORTING
Per 260.505 RSMo, any emergency involving a hazardous substance must be reported to the Department's 24-hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest possible moment after discovery. The Department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I.
https://revisor.mo.gov/main/OneSection.aspx?section=260.500&bid=13989&hl=

Any other spills, overflows, or unauthorized discharges reaching waters of the state must be reported to the regional office during normal business hours, or after normal business hours, to the Department's 24-hour Environmental Emergency Response spill line at 573-634-2436.

Certain industrial facilities are subject to the self-implementing regulations for Oil Pollution Prevention in 40 CFR 112, and are required to initiate and follow Spill Prevention, Control, and Countermeasure (SPCC) Plans. This permit, as issued, is not intended to be a replacement for any SPCC plan, nor can this permit's conditions be automatically relaxed based on the SPCC plan if the permit is more stringent than the plan.

SLUDGE – INDUSTRIAL
Industrial sludge is solid, semi-solid, or liquid residue generated during the treatment of industrial process or non-process wastewater in a treatment works; including but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and any material derived from industrial sludge. Industrial sludge could also be derived from holding structure dredging or other similar maintenance activities. Certain oil sludge, like those from oil water separators, are subject to self-implementing federal regulations under 40 CFR 279 for used oils.
- ✓ Not applicable; industrial sludge is not permitted for discharge, land application, or disposal under this permit. This permit does not consider coal ash to be industrial sludge.

STANDARD CONDITIONS
The standard conditions Part I attached to this permit incorporate all sections of 10 CSR 20-6.010(8) and 40 CFR 122.41(a) through (n) by reference as required by law. These conditions, in addition to the conditions enumerated within the standard conditions must be reviewed by the facility to ascertain compliance with this permit, state regulations, state statutes, federal regulations, and the Clean Water Act.

STORMWATER PERMITTING: LIMITATIONS AND BENCHMARKS
Because of the fleeting nature of stormwater discharges, the Department, under the direction of EPA guidance, has determined monthly averages are capricious measures of stormwater-only discharges. The *Technical Support Document for Water Quality Based Toxics Control* (EPA/505/2-90-001; 1991) §3.1 indicates most procedures within the document apply only to water quality-based approaches, not end-of-pipe technology-based controls. Hence, stormwater-only outfalls will generally only contain a maximum daily limit (MDL), a benchmark, a specific BMP, or a monitoring requirement as dictated by site specific conditions, the BMPs in place, the BMPs proposed, past performance of the facility, and the receiving water's current quality.

Sufficient rainfall to cause a discharge for one hour or more from a facility would not necessarily cause significant flow in a receiving stream. Acute Water Quality Standards (WQSs) are based on one hour of exposure and must be protected at all times. Therefore, industrial stormwater facilities with toxic contaminants present in the stormwater may have the potential to cause a violation of acute WQSs if toxic contaminants occur in sufficient amounts. In this instance, the permit may apply daily maximum limitations.

Conversely, it is unlikely for rainfall to cause a discharge for four continuous days from a facility; if this does occur however, the receiving stream will also likely sustain a significant amount of flow providing dilution. Most chronic WQSs are based on a four-day exposure with some exceptions. Under this scenario, most industrial stormwater facilities have limited potential to cause a violation of chronic water quality standards in the receiving stream.

A standard mass-balance equation cannot be calculated for stormwater because stormwater flow and flow in the receiving stream cannot be determined for conditions on any given day or storm event without real-time ad-hoc monitoring. The amount of stormwater discharged from the facility will vary based on current and previous rainfall, soil saturation, humidity, detention time, BMPs, surface permeability, etc. Flow in the receiving stream will vary based on climatic conditions, size of watershed, area of surfaces with reduced permeability (houses, parking lots, and the like) in the watershed, hydrogeology, topography, etc. Decreased permeability may increase the stream flow dramatically over a short period of time (flash).
First, the technology in place at the site to control pollutant discharges in stormwater is evaluated. Other permits are also reviewed for similar activities. A review of the guidance forming the basis of Environmental Protection Agency's (EPA's) *Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity* (MSGP) may also occur. Because precipitation events are

sudden and momentary, and if a facility has disclosed appropriate BMPs applicable to the pollutants for the site, the facility may not be eligible for prescribed best management practices.

40 CFR 122.44(b)(1) requires the permit implement the most stringent limitations for each discharge, including industrially exposed stormwater; and 40 CFR 122.44(d)(1)(i) and (iii) requires the permit to include water-quality based effluent limitations (WQBELs) where reasonable potential has been found. However, because of the non-continuous nature of stormwater discharges, staff are unable to perform statistical Reasonable Potential Analysis (RPA) under most stormwater discharge scenarios. Reasonable potential determinations (RPDs; see REASONABLE POTENTIAL above) using best professional judgment are performed.

BMP inspections typically occur more frequently than sampling. Sampling frequencies are based on the facility's ability to comply with the benchmarks and the requirements of the permit. Inspections must occur after large rain events and any other time an issue is noted; sampling after a benchmark exceedance may need to occur to show the corrective active taken was meaningful.

- ✓ Applicable, this facility has stormwater-only outfalls where minimum BMPs are required. This permit requires specific management practices for all stormwater areas and outfalls. All stormwater outfalls shall be maintained using best management practices such that discharges to waters of the state are controlled. All outfalls are subject to SWPPP requirements. See special condition "Stormwater Management Areas".
- ✓ Each of the requirements stipulated in the permit for the stormwater management at the site has been determined to be effective at controlling pollution under a number of precipitation scenarios; and is deemed more protective than effluent sampling or numeric benchmarks at this site. This site consists of only stormwater and significant vegetated areas. There is no ash exposed to stormwater anymore. There is no wastewater any more at this site. This facility is conducting demolition activities, and some groundwork (land disturbance). The MORA permit for land disturbance does not implement any numeric benchmarks.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A SWPPP must be prepared by the facility if the SIC code or facility description type is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff.

Pursuant to 40 CFR 122.44(k), Best Management Practices (BMPs) must be used to control or abate the discharge of pollutants when: 1) Authorized under §304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under §402(p) of the CWA for the control of stormwater 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. A BMP may take the form of a numeric benchmark. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in 2015 and again in 2021 https://www.epa.gov/sites/default/files/2021-03/documents/swppp_guide_industrial_2021_030121.pdf BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally in accordance with the Stormwater 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. Additional information can be found in *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006; September 1992).

Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the facility can take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

The facility can review the precipitation frequency maps for development of appropriate BMPs. The online map https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=mo can be targeted to the facility location and is useful when designing detention structures and planning for any structural BMP component. The stormwater map can also be used to determine if the volume of stormwater caused a disrupted BMP; and if the BMP must be re-designed to incorporate additional stormwater flows.

Areas which must be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan shall be formulated to best control the amount of pollutant being released and discharged by each activity or source. This must include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action must be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but may be

continued more frequently if BMPs continue to fail. If failures do occur, continue this trial-and-error process until appropriate BMPs have been established.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. For further guidance, consult the antidegradation implementation procedure (https://dnr.mo.gov/document-search/antidegradation-implementation-procedure).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs which are reasonable and cost effective. The AA evaluation can include practices designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure* (AIP), §II.B.

If parameter-specific numeric benchmark exceedances continue to occur and the facility feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the facility can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which must contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the Department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification, which includes an appropriate fee; the application is found at: https://dnr.mo.gov/water/business-industry-other-entities/permits-certification-engineering-fees/wastewater

- ✓ Applicable; a SWPPP shall be developed and implemented for this facility; see specific requirements in the SPECIAL CONDITIONS section of the permit. The minimum BMPs prescribed in the permit are developed pursuant to 10 CSR 20-7.031(3) for antidegradation procedures required for stormwater, and BMP use for stormwater discharges is authorized under 40 CFR 122.44(k)(2).

SUFFICIENTLY SENSITIVE ANALYTICAL METHODS

Please review Standard Conditions Part 1, §A, No. 4. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 or 40 CFR 136 unless alternates are approved by the Department and incorporated within this permit. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure the selected methods are able to quantify the presence of pollutants in any given discharge at concentrations low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. The reporting limits established by the chosen laboratory must be below the lowest effluent limits established for the specified parameter (including any parameter's future limit after an SOC) in the permit unless the permit provides for an ML or if the facility provides a written rationale to the Department. It is the facility's responsibility to ensure the laboratory has adequate equipment and controls in place to quantify the pollutant. Inflated reporting limits will not be accepted by the Department if the reporting limit is above the parameter value stipulated in the permit. A method is "sufficiently sensitive" when; 1) the method quantifies the pollutant below the level of the applicable water quality criterion or; 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015 and or 40 CFR 136. These methods are also required for parameters listed as monitoring only, as the data collected may be used to determine if numeric limitations need to be established. A facility is responsible for working with their contractors to ensure the analysis performed is sufficiently sensitive.

TECHNOLOGY-BASED ASSESSMENTS

Section 301(b)(1)(C) of the Clean Water Act requires that permits include any effluent limitations necessary to meet water quality standards. Section 301(b)(1)(B) of the CWA, additionally, requires the inclusion of technology based effluent limitations. Where national Effluent Limitations Guidelines have not been developed, a case-by-case determination of technology based effluent limitations is required under section 402(a)(1) of the CWA. The EPA's regulations at 40 CFR 125.3 establishes best professional judgment of applicable technology limits as Best Available Treatment Technology Economically Available for toxic and non-conventional pollutants.

TECHNOLOGY-BASED EFFLUENT LIMITS (TBEL) – CASE-BY-CASE ASSESSMENT FOR SURFACE DISCHARGES

Facially, 40 CFR 423 is no longer applicable for the following reasons. Quoting the applicability statement in 40 CFR 423.10, "The provisions of this part apply to discharges resulting from the operation of a generating unit by an establishment whose generation of electricity is the predominant source of revenue or principal reason for operation, and whose generation of electricity results primarily

from a process utilizing fossil-type fuel (coal, oil, or gas), fuel derived from fossil fuel (e.g., petroleum coke, synthesis gas), or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium. This part applies to discharges associated with both the combustion turbine and steam turbine portions of a combined cycle generating unit."

The applicability statement is written in the present tense which appears to exclude closed facilities; and the applicability statement only includes facilities with the steam-cycle and who receive third party payments for generating and distributing the electricity. This facility has turned off the coal-fired steam-cycle boilers and only generates minimal electricity from turbine-type generators which do not have a steam cycle (termed peaking generation). Additionally, the Department has sought additional information from Ameren, and in October 2023, the facility has no more sources of wastewater; this is now a stormwater and groundwater only facility.

The purpose of 40 CFR 125 is to require the issuing authority to consider whether any technology standards are necessary for the facility. Some technology requirements are applicable to facilities via rule, such as 40 CFR 401 through 499 (national limits, or Effluent Limit Guidelines, ELGs). Other TBELs are developed on a case-by-case basis.

Some promulgated TBELs may not apply because of fundamentally different factors pursuant to 40 CFR 125.30; the factors utilized in determining the ELG limits are listed in the development document for that specific category. In in these instances, any effluent limitations alternative to those required by national limits (ELGs under sections 301 and 304 of the Act promulgated as 40 CFR 401 through 499) should not be imposed on a discharger because factors relating to the discharger's facilities, equipment, processes or other factors that are fundamentally different from the factors considered by EPA in development of those national limits.

Another regulatory conundrum is found under 40 CFR 125.30, which applies to all national limitations promulgated under sections 301 and 304 of the Act, except for the BPT limits contained in 40 CFR 423.12 (steam electric generating point source category). This regulatory idiom then does not allow the Department to apply fundamentally different factors approach to ELG-required limits for power plants.

After thoughtful consideration, the Department will continue the requirements in 40 CFR 423 for the appropriate waste streams because the case-by-case BAT determination would be the same as the requirements laid out in 40 CFR 125.3(c)(2). On a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable, this permit shall continue to apply 40 CFR 423 to the appropriate similar waste-streams generated by this facility.

The surface water technology implemented at this facility is settling, Best Management Practices (BMPs), pH adjustment, and flocculation within a surface impoundment. According to the ELG database https://owapps.epa.gov/elg/ this meets the industry standard for 40 CFR 423 for low volume waste sources (TSS, pH, oil and grease) therefore no additional technology is required for surface water discharges. Pg. 410 of the 1974 Technical Development Document (TDD): Segregation from higher volume wastes, equalization, oil separation, chemical addition, solids separation, and pH adjustment. In the 2015 regulations, EPA made structural modifications to the BPT regulations and establishes separate definitions for FGD wastewater, FGMC wastewater, gasification wastewater, and combustion residual leachate, making clear that these four waste streams are no longer considered low volume waste sources (80 FR 67848) (2015 TDD, pg. 8-2). (Development Document for the Steam Electric Power Generating Point Source Category (EPA-821-R-15-007)) This facility does not have wastewater any more. In addition to the surface impoundment, this facility employs best management practices and polymer flocculation. BMPs established are in addition to the minimum industry standard. Because the facility employs an industry standard, no additional technology is considered other than what the facility is already performing.

TECHNOLOGY-BASED ASSESSMENT FOR GROUNDWATER AND FOR GROUNDWATER INFILTRATION INTO SURFACE WATER
On October 12, 1980, Congress enacted the Solid Waste Disposal Act Amendments of 1980 (Public Law 96-482), which included the Bentsen and Bevill Amendments (sections 3001(b)(2)(A) and 3001(b)(3)(A)) These new sections exempted "special wastes" from regulation under Subtitle C of RCRA until further study and assessment of risk could be performed. Specifically, the Bevill Amendment (section 3001(b)(3)(A)) exempted fossil fuel combustion waste, among others.

The Bevill and Bentsen Amendments also required EPA to complete full assessments of each exempted waste and submit a formal report to Congress on its findings. Section 8002 explicitly identified the requirements for each special waste study and established deadlines for submission of the final reports. After completion of each respective "Report to Congress", EPA was then required to make a final regulatory determination within six months as to whether the special waste in question warranted regulation as a hazardous waste under Subtitle C of RCRA.

After studying these categories of wastes, EPA made two separate regulatory determinations (in 1993 and in 2000) to exclude large-volume coal combustion wastes and the remaining fossil fuel combustion wastes from hazardous waste regulation under Subtitle C of RCRA.[1]

[1] https://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43149.pdf

On April 17, 2015, EPA issued federal regulations establishing requirements for the safe disposal of residuals generated from the combustion of coal at electric utilities and independent power producers. These regulations establish technical requirements for CCR landfills and surface impoundments under Subtitle D of RCRA[2], 40 CFR 257, the nation's primary law for regulating solid waste.

The EPA has not provided guidance to determine technology feasibility at historic coal ash ponds. The Development Documents[3] for the regulatory decision-making process are an encompassing BAT decision in and of themselves. Therefore, instead of reviewing applicability of the ash mass to Subpart D, the Department is evaluating the waste mass as a type of remedial activity similar to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) because groundwater is protected under CERCLA, and groundwater is a water of the state.

The EPA's December 28, 2016, OLEM Directive 9200.3-117[4] memo worked to resolve some of the inadequacies of current programs, and described deficiencies in groundwater evaluation documents. One of these metrics is the technical impracticability flowchart process. While this process is to be used for CERCLA sites, the Department has reviewed the tenets identified in that document and compared them to the BAT decision making process per 40 CFR 125, below.

The Department notes that numeric effluent limits are not required to meet the onus of a BAT determination. Intentionally, in Subtitle D, the EPA included characterizations of site hydrogeology, which includes surface water, and closure requirements also considered surface water 40 CFR 257.102(d)(1)(i); and the Department has reviewed the new federal requirements which are similar to the state's permit's requirements over the past 10+ years for this site.

Groundwater remedial activities for coal ash are a complex and ever-evolving field. The technologies used to remediate groundwater contaminated with coal ash can vary depending on the extent of the contamination, the type of coal ash, and the regulatory requirements of the state or federal government. But the remedial activities explored here may not be necessary; particularly if there is no reasonable potential to cause or contribute to exceedances of Missouri Water Quality Standards (WQS); or if the facility completes a Risk-Based Corrective Action (RBCA) and the report does not identify any receptors.[5]

Some common groundwater remedial activities for coal ash include: Excavating coal ash and contaminated soil and placing them in a lined landfill. Capping the coal ash to prevent infiltration of precipitation. Constructing a barrier around the coal ash to contain groundwater and prevent its migration to other areas. Pumping groundwater out of aquifers to remove contaminants and prevent migration off-site. Monitoring natural attenuation of contaminant concentrations in groundwater.

Each of these technologies has its own advantages and disadvantages. Excavating coal ash can be expensive and disruptive, but it is the most effective way to remove contaminants from the site. Capping the coal ash can be less expensive, but it does not remove contaminants from the soil. Constructing a barrier around the coal ash can be less expensive than excavating coal ash, but it is not as effective at removing contaminants from groundwater. Pumping groundwater out of aquifers is expensive, but it can be effective at removing contaminants from groundwater. Monitoring natural attenuation (MNA) can be less expensive than other remedial activities, but it can take longer to remove contaminants from groundwater as MNA is not an active process.

The choice of remedial technology for a particular site will depend on a variety of factors, including the extent of the contamination, the type of coal ash, the regulatory requirements, and the cost.

The following are some of the latest developments in groundwater remedial activities for coal ash: The use of in situ injection of reagents to treat groundwater contaminated with coal ash or the use of nanotechnology to develop new methods for removing contaminants from groundwater. These developments are promising, but they are still in the early stages of development. More research is needed to determine their effectiveness and to ensure that they are safe and environmentally friendly.

Regarding groundwater clean-up approaches, groundwater cleanup technologies and strategies have evolved since the Superfund program's inception in 1980. To be very clear, this is not a CERCLA (Superfund) site. Initially, groundwater pump and treat was the

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[2] Missouri has not established a state coal ash program, nor is Missouri required to establish any such program. Therefore, the federal coal ash regulations in 40 CFR 257 Subpart D are not managed by Missouri. The federal coal ash regulations are self-implementing. A self-implementing regulation automatically applies to all applicable facilities with no permit or other type of initiating document necessary to establish conditions. A self-implementing regulation requires facilities to follow the rules, self-manage all documents, reporting, and compliance requirements. The Department is not making any official determinations of applicability nor is the Department ensuring inapplicability of the federal regulations as the federal regulations may change. If Missouri does establish a coal ash program, those regulations are pursuant to Missouri solid waste statutes, 260 RSMo, therefore would still not be included in this permit.

[3] https://www.epa.gov/coalash

[4] https://semspub.epa.gov/work/HQ/198193.pdf

[5] https://dnr.mo.gov/waste-recycling/investigations-cleanups/public-guidance-assistance/missouri-risk-based-corrective-action-mrbca/departmental

primary technology and strategy used, often as the only groundwater remedial approach. Over the years, new groundwater treatment technologies and approaches have become available allowing flexibility in how cleanup goals can be achieved. These technologies include some of the following: pump and treat; engineered barriers; and monitored natural attenuation. Monitored natural attenuation (MNA) is a technology that is currently employed at this site.

Technology assessment is the process of evaluating the potential benefits and risks of old and new technologies. In the context of groundwater remedial activities for coal ash, the technology assessment incorporates evaluating the potential benefits and risks of the various remedial activities that are available; and simply because a remedial activity is available does not mean it is the best for the site. Best Available Technology (BAT) are the environmental quality objectives used to establish permit conditions for specific facilities. BAT correspond to technologies and control measures with minimum environmental impact and acceptable financial and environmental cost.

The following information is used to proceed with the decision-making process; to choose the best approach (BAT) for a particular site. A technology analysis identical to 40 CFR 125.3(d) has severe limitations, even with a plethora of data collected over the last twelve years, for this site. The permit writer must consider many factors which are not applicable to this site.

- 40 CFR 125.3(d)(3)(i) The age of equipment and facilities involved: this facility has no groundwater equipment.
- 40 CFR 125.3(d)(3)(ii) The process employed: the facility has no groundwater processes.
- 40 CFR 125.3(d)(3)(iii) The engineering aspects of the application of various types of control techniques: how is the facility expected to employ new technology? How are the technologies to be assessed; what is the baseline; is there a numeric requirement? This element has not been advised by EPA, although the department has reviewed several strategies relating to cleanup programs[6]
- 40 CFR 125.3(d)(3)(iv) Process changes: there are no active groundwater processes at this facility which could be changed.
- 40 CFR 125.3(d)(3)(v) The cost of achieving such effluent reduction: there has not been a baseline established for minimum removal efficiencies for groundwater which still contains a waste mass.
- 40 CFR 125.3(d)(3)(vi) Non-water quality environmental impact (including energy requirements): Any change in the current groundwater configuration would incur an environmental impact beyond the contaminants already present in the groundwater, such as energy required to pump, or carbon emissions from excavation to remove the solids.

The County of Maui Hawaii v. Hawaii Wildlife Fund Decision was reviewed. The County of Maui operates a wastewater reclamation facility on the island of Maui, Hawaii. The facility collects sewage from the surrounding area, partially treats it, and pumps the partially treated wastewater through four injection wells approximately 200 feet deep. This effluent, amounting to about 4 MGD, then travels approximately one-half mile through groundwater to the ocean. This facility did not have an NPDES permit. Environmental groups brought suit in federal court to challenge Maui's unpermitted discharges. A hydrogeologic connection between Maui's discharges and the coastal ocean waters was conclusively demonstrated by a joint dye tracer study conducted by EPA, the Hawaii Department of Health, the U.S. Army Engineer Research and Development Center, and researchers at the University of Hawaii. The study found that at least 64% of the partially treated effluent emerged into the coastal ocean waters near a beach. The trial court determined that the facility is required to have an NPDES permit for the discharges from the injection wells, because the path to the ocean is clearly ascertainable and the discharge from the wells into groundwater is functionally one into navigable waters. On appeal, the Ninth Circuit affirmed, but articulated a different, broader standard for when discharges to groundwater require an NPDES permit. The Ninth Circuit's opinion reached an opposite conclusion from the Sixth Circuit, which had recently decided that discharges to groundwater do not trigger the NPDES permit requirement. This created a "circuit split," meaning that the controlling case law in two or more federal appellate courts was conflicting. The U.S. Supreme Court is more likely to grant review of circuit decisions in which there is a circuit split, in order to resolve the inconsistencies and establish consistent, nationwide case law.

The Supreme Court, in a 6-3 majority decision, ultimately concluded that the NPDES permitting requirements apply when there is a direct discharge from a point source into navigable waters or when there is "the functional equivalent of a direct discharge." The majority opinion noted that the interpretation advanced by Maui would allow a permittee to avoid the permit requirement by simply moving its outfall a few yards away from the waterbody. The Court concluded that Congress could not have intended to create "such a large and obvious loophole" in a fundamental provision of the Clean Water Act.

The majority opinion offered some guidance to lower courts when applying the new "functional equivalent" test. The opinion stated that: "The object in a given scenario will be to advance, in a manner consistent with the statute's language, the statutory purposes that Congress sought to achieve." The majority interpreted Congressional intent as requiring an NPDES permit for discharges from a point source directly into navigable waters, "or when the discharge reaches the same result through roughly similar means." The Court then opined: Time and distance are obviously important. Where a pipe ends a few feet from navigable waters and the pipe emits pollutants that travel those few feet through groundwater (or over the beach), the permitting requirement clearly applies.

[6] https://dnr.mo.gov/document-search/monitored-natural-attenuation-groundwater-contamination-brownfields-voluntary-cleanup-program-sites-pub2110/pub2110

The Court acknowledged that middle instances would be more difficult, but that there were too many potentially relevant factors applicable to factually different cases for the Court to establish a test more specific than the "functional equivalent" standard. The Court offered seven non-exclusive, non-exhaustive factors as examples that may be relevant, depending on the circumstances of a particular case. Those examples of "functional equivalent" factors are: (1) transit time, (2) distance traveled, (3) the nature of the material through which the pollutant travels, (4) the extent to which the pollutant is diluted or chemically changed as it travels, (5) the amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source, (6) the manner by or area in which the pollutant enters the navigable waters, (7) the degree to which the pollution (at that point) has maintained its specific identity. Time and distance will be the most important factors in most cases, but not necessarily every case.

This decision was significant in Hawaii and other states that do not specifically protect groundwater or regulate groundwater through state law. In Missouri, however, groundwater is within the definition of "Waters of the State" and, as such, has protected uses established. Therefore, all Missouri State Operating Permits must ensure protection of surface water as well as groundwater.

EPA's interpretation of the Maui decision has identified potential new point source discharges that could be regulated, like subsurface discharges/leaching from wastewater or stormwater ponds, landfills, mine tailings storage, coal combustion residuals impoundments, and subsurface injection systems. However, when permitting these potential point sources in Missouri State Operating Permits, the WPP already protects groundwater, regardless of whether there is a surface water connection or not. Missouri also permits who operate, use, or maintain water containment sources, point source facilities for storage, treatment, land application, or disposal of wastewater that are operated as no-discharge facilities. As such, the Department requests information about potential subsurface discharges and establishes permit limitations and conditions based upon available information about these types of subsurface discharges.

To be clear, this Supreme Court decision did not interpret the Clean Water Act to require NPDES permits for non-point sources where the source of the pollutant(s) cannot be established. This decision does clarify, however, that discharges to groundwater must also consider hydraulic connections to surface water, meaning that discharges through the subsurface in areas of regular surface water interaction (e.g. large river alluvial areas) require evaluation of groundwater and surface water protection standards for all pollutants. Additionally, in Missouri's karst geology, areas of losing streams and sinkholes may need to be evaluated both for groundwater protection, but also for potential nearby areas where this groundwater may re-surface, if a connection to the surface waterbody is suspected.

What this decision does clarify, is that a point source does not need to directly discharge into a regulated waterbody to be considered a discharge. The Department ensures direct surface discharges, and discharges that are the "functional equivalent" of a direct surface discharge, are properly permitted, in addition to discharges to groundwater-only, as described above.

Here, the Department considers whether a discharge to groundwater is the functional equivalent of a surface discharge to navigable waters, as this will determine whether the permit is subject to the terms, conditions, and requirements of the federal NPDES regulations as well as the Missouri state clean water permitting requirements. While this likely will not change permit limits, terms, or conditions, it may add administrative requirements associated with the federal permitting process, like technology assessments.

As Missouri already has laws and regulations that protect both groundwater and surface water, and as the Water Protection Program already permits no-discharge facilities, discharging facilities, and potential groundwater impacts, this Supreme Court decision does not result in dramatic differences in permitting pertaining to groundwater protection and groundwater conveyance into surface waters in Missouri. The Maui decision does clarify the obligation on permit applicants, permittees, and permit writers to fully evaluate wastewater generated, stored, discharged, or land applied; and the potential impacts to regulated waters of the state, both surface waters as well as groundwater.

The special conditions of this permit allow for a discharge to surface water from the subsurface impacted groundwater: as was described in Maui. See additional site-specific background information under COAL ASH IMPOUNDMENTS above. This discharge was implied in previous permits. This is not a new discharge. However, given new regulatory standards for coal ash sites, the Department is re-evaluating historical practices and the technologies associated with historical ash management, Best Available Technology (BAT) is discussed below.

This facility is subject to 40 CFR 257 Subpart D (for brevity, "§D"), this permit makes no claims to implement those regulations; this permit does not have authority to implement conditions pursuant to those regulations, although data supplied by the facility under those regulations was reviewed as it is pertinent to the allowances provided in this permit. 40 CFR 257 Subpart D is self-implementing. But only the NPDES program can authorize discharges into surface waters.

The facility was required by §D to provide analysis of the technologies appropriate for closure and maintenance of the historic ash ponds. The information was reviewed; and can be found at Ameren.com. The liners identified in the reports do not meet §D standards of impermeable liners. Because of the studies, including the geohydro investigations, it is known that the facility is discharging from the subsurface into surface waters; primarily the Mississippi River, and also to the Meramec. There are no pollutants which have

reasonable potential (RP) in the surface water from a subsurface discharge. Because of this, the analysis concludes that monitored natural attenuation (MNA) for the groundwater to surface water discharges is appropriate. See additional, yet separate, requirements this facility must meet for compliance with groundwater quality standards (GWQS) pursuant to 10 CSR 7.031 under GROUNDWATER MONITORING above.

Items (i), (ii), (iv), (v), and (vi) are determined to be inapplicable, hence resulted in (iii) being the only technology requirement considered. Through the review of groundwater remediation technologies currently available in the United States, and pairing that with the results of the RBCA, the Department determined monitored natural attenuation (MNA) is the preferred technology at this site. The Department has completed the above steps for this permit renewal.

The BAT decision remains the current technology, which is capping and closure in place. The Department, through allowance of the subsurface-to-surface discharges, requirement to maintain a vegetative cap, requirement to sample groundwater, and allowance to leave the ash in place, the Department has chosen MNA as the Best Available Technology (BAT) for groundwater at this site pursuant to the considerations set forth in 40 CFR 125.3(d)(3) for case-by-case TBELs.

TECHNOLOGY-BASED ASSESSMENT FOR STORMWATER

Coupled with requirements for antidegradation reviews, the Department evaluated potential degradation in surface water from the stormwater discharges. Because the facility has reduced pollutant loading overall (no more thermal discharge), an antidegradation review is not triggered. The permit contains a list of minimum best management practices that apply to 1) the whole site; and 2) only the stormwater outfalls. The requirements implement minimum technology and operational activities designed to apply minimum technology standards to the stormwater at the site. The BAT for stormwater is identified in the special conditions for "Stormwater Management Areas" as minimum controls per the considerations set forth in 40 CFR 125.3(d)(3) for case-by-case TBELs.

UNDERGROUND INJECTION CONTROL (UIC)

Class V wells are sub-surface dispersal or injection of any industrial wastewater; and in certain circumstances, may also be considered a Class V well if it is domestic wastewater.

- ✓ Not applicable; this facility is not performing UIC at this site and the designs do not implicate UIC.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS

As per [10 CSR 20-2.010; definitions], the WLA is the maximum amount of pollutant each discharger is allowed to discharge into the receiving stream without endangering water quality. Only streams with available load allocations can be granted discharge allowances. Outfalls afforded mixing allocations provide higher limits because the receiving stream is able to accept more pollutant loading without causing adverse impacts to the environment or aquatic life.

- ✓ Applicable; wasteload allocations for toxic parameters were calculated using water quality criteria or water quality model results and by applying the dilution equation below. These equations are statistical equations (See Part III – REASONABLE POTENTIAL ANALYSIS) used to calculate the hypothetical or actual variability of the wastewater and the spreadsheet output obtains an effluent limit. Most toxic parameter's WLAs are calculated using the *Technical Support Document For Water Quality-Based Toxics Control* or "TSD" EPA/505/2-90-001; 3/1991, §4.5.5.

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$

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

- ✓ Criteria maximum concentration (CMC) are the acute in-stream standards for a specific pollutant.
- ✓ Criteria continuous concentration (CCC) are the chronic in-stream standards for a specific pollutant.
- ✓ Acute wasteload allocations (WLAa) are designated as daily maximum limits (maximum daily limit: MDL)., were determined using applicable water quality criteria
- ✓ Chronic wasteload allocations (WLAc) are designated as monthly average limits (average monthly limit: AML) and are typically the most stringent limits applied. Facilities subject to average monthly limits are welcome to take additional samples in the month to meet any lower limit by averaging the results. When only one sample is taken in the month, the sample result is applied to both the daily maximum and monthly average.
- ✓ Mixing: when a stream's flow 7Q10 is above 0.1 cfs, (or lake width is sufficient) the discharge may be afforded mixing allowances. The mixing criteria for toxics are found at 10 CSR 20-7.031(5)(A)4 and a full explanation of mixing is found in Part II – WATERBODY MIXING CONSIDERATIONS.
- ✓ Number of Samples "n": effluent quality is determined by the underlying distribution of daily values, determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying assumption which is, at a minimum, targeted to comply with the values dictated by the WLA. Therefore, it is recommended the actual planned frequency of monitoring be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure

being employed uses an assumed number of samples "n = 4". See additional information under Part III – REASONABLE POTENTIAL ANALYSIS

WHOLE EFFLUENT TOXICITY (WET) TEST

A WET test is a quantifiable method to conclusively determine if discharges from the facility cause toxicity to aquatic life by itself, in combination with, or through synergistic responses, typically when mixed with receiving stream water. Under the CWA §101(a)(3), requiring WET testing is reasonably appropriate for Missouri State Operating Permits to quantify toxicity. WET testing is also required by 40 CFR 122.44(d)(1) when RP is found. WET testing ensures the provisions in 10 CSR 20-6 and Missouri's Water Quality Standards in 10 CSR 20-7 are being met; the acute WQS for WET is 0.3 TUa. Under 10 CSR 20-6.010(8)(A)4, the Department may require other terms and conditions it deems necessary to ensure compliance with the CWA and related regulations of the Missouri Clean Water Commission. Missouri Clean Water Law (MCWL) RSMo 644.051.3 requires the Department to set permit conditions complying with the MCWL and CWA. 644.051.4 RSMo specifically references toxicity as an item the Department must consider in permits (along with water quality-based effluent limits); and RSMo 644.051.5 is the basic authority to require testing conditions. Requirements found in the federal application requirements for POTWs (40 CFR 122.21(j)(5)) do not apply to industrial facilities, therefore WET testing can be implemented on a case-by-case basis following the factors outlined below. Annual testing is the minimum testing frequency if reasonable potential is found; monitoring requirements promulgated in 40 CFR 122.44(i)(2) state "requirements to report monitoring results shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge, but in no case less than once per year." To determine reasonable potential, factors considered are: 1) history of toxicity; 2) quantity and quality of substances (either limited or not) in the permit with aquatic life protections assigned; and 3) operational controls on toxic pollutants. See Part III under REASONABLE POTENTIAL for additional information. A facility does not have to be designated as a major facility to receive WET testing; and being a major facility does not automatically require WET testing. Additionally, per 40 CFR 122.44(d)(1)(v), limits on whole effluent toxicity are not necessary where the permitting authority demonstrates in the fact sheet, using the procedures in 40 CFR 122.44(d)(1)(ii) of this section, that chemical-specific limits or specified operational controls are sufficient to attain and maintain applicable numeric and narrative water quality standards.

If WET limits are applied to this facility, follow up testing applies. When a facility exceeds the TU established in the permit, three additional follow-up tests are triggered. The follow up test results do not negate the initial testing result. If the facility is within the prescribed TU limit for all three follow up tests, then no further testing is required until the next regularly scheduled tests. If one or more additional tests exceed the TU limit, the facility may consider beginning the Toxicity Identification Evaluation (TIE) and Toxicity Identification Reduction (TRE) processes instead of waiting for three consecutive TU exceedances. The TIE and TRE process can take up to two years, especially when toxicity is variable or transient. We urge facilities to work closely with their WET testing laboratory to follow nationwide guidance for determining causes of toxicity and curative activities to remove toxicity. Additional wastewater controls may be necessary; and while, generally, no Construction Permit (CP) is required for adding treatment at industrial facilities, the facility may check with the Engineering Section to determine a plan of action.

If WET testing failures are from a known toxic parameter, and the facility is working with the Department to alleviate that pollutant's toxicity in the discharge, please contact the Department prior to conducting follow-up WET testing. Under certain conditions, follow-up testing may be waived when the facility is already working to reduce and eliminate toxicity in the effluent. For the purposes of reporting, the laboratory may supply either the TU value, the LC_{50}, or the NOEC. If the laboratory only supplied the LC_{50} or the NOEC value, the toxic unit is calculated by $100/LC_{50}$ for acute tests, or 100/NOEC for chronic tests. The TU value is entered in the eDMR system. Reports showing no toxicity are usually entered as <1.

- ✓ Not applicable; WET testing is not found in this permit because the pollutants listed in the permit are effective at controlling toxicity in the receiving water; and because this facility discharges intermittently from outfall #003, because the discharge is contingent on precipitation.

PART IV. EFFLUENT LIMIT DETERMINATIONS

OUTFALL #003 – STORMWATER (BASIN CONTAINS HISTORIC ASH)

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	*	SAME	WEEKLY ‡	MONTHLY	24 HR. TOT
CONVENTIONAL							
OIL & GREASE	mg/L	15	10	SAME	ONE/MONTH	MONTHLY	GRAB
pH †	SU	6.5 TO 9.0	-	SAME	WEEKLY ‡	MONTHLY	GRAB
TOTAL SUSPENDED SOLIDS (TSS)	mg/L	100	30	SAME	ONE/MONTH	MONTHLY	GRAB
METALS							
ALUMINUM, TR	µg/L	1865	*	INTERIM NEW	ONE/MONTH	MONTHLY	GRAB
ALUMINUM, TR	µg/L	750	*	FINAL	ONE/MONTH	MONTHLY	GRAB
BORON, TR	µg/L	2000	*	NEW	ONE/MONTH	MONTHLY	GRAB
CHROMIUM, TOTAL	µg/L	*	*	NEW	ONE/MONTH	MONTHLY	GRAB
CHROMIUM (VI), DISSOLVED	µg/L	50	*	INTERIM NEW	ONE/MONTH	MONTHLY	GRAB
CHROMIUM (VI), DISSOLVED	µg/L	16	*	FINAL	ONE/MONTH	MONTHLY	GRAB

*	monitoring and reporting requirement only
‡	Weekly monitoring is monitoring any one day between Monday and Sunday. For weeks spanning two months, only 1 sample is required. Only samples collected in the month may be averaged for the month. All data obtained must be uploaded as a DMR attachment per Standard Conditions.
†	report the minimum and maximum pH values; pH is not to be averaged
new	parameter not established in previous state operating permit
same	is same as outfall #003
interim	parameter requirements prior to end of SOC
final	parameter requirements at end of SOC
TR	total recoverable

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow

In accordance with [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. If the facility is unable to obtain effluent flow, then it is the responsibility of the facility to inform the Department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD), weekly monitoring required.

CONVENTIONAL:

Oil & Grease

15 mg/L daily maximum; 10 mg/L monthly average; continued from outfall #003 in the previous permit using RPD. The facility reported from non-detect to 4.6 mg/L in the last permit term at outfall #003. Oil and grease is considered a conventional pollutant. 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. The test can also detect some volatile organics such as benzene, toluene, ethylbenzene, or xylene, but these constituents are often lost during testing due to their boiling points. An RPD on this parameter found RP because of the activities occurring on site, such as transportation (haul road), and associated demolition activities. Oils and greases of different densities will possibly form sheen or unsightly bottom deposits at levels which vary from 10 mg/L. To protect the general criteria, it is the responsibility of the facility to visually observe the discharge and receiving waters for sheen or bottom deposits. The limit this permit applies does not allow the facility to violate general criteria pursuant to 10 CSR 20-7.015(4) even if data provided are below the numeric limit. This parameter was considered under TBEL analysis utilizing factors in 40 CFR 125.3 and 40 CFR 423.12 et seq. See Part III TECHNOLOGY-BASED EFFLUENT LIMITS (TBEL) – CASE-BY-CASE ASSESSMENT FOR SURFACE DISCHARGES for more information. However, TBEL limits are less stringent 20 mg/L daily maximum and 15 mg/L monthly average) therefore will not be applied to this outfall.
AQL Chronic: 10 mg/L per 10 CSR 20-7.031 Table A1

Set chronic standard equal to chronic WLA per TSD §5.4.2 (EPA/505/2-90-001); multiply by 1.5 to obtain acute limit.
10 mg/L * 1.5 = 15 mg/L

pH
6.5 to 9.0 SU – instantaneous grab sample. Water quality limits [10 CSR 20-7.031(5)(E)] are applicable to this outfall. pH is a fundamental water quality indicator. Additionally, metals leachability and ammonia availability in wastewater is dependent on pH. Limitations in this permit will protect against aquatic organism toxicity, downstream water quality issues, human health hazard contact, and negative physical changes in accordance with the general criteria at 10 CSR 20-7.031(4) and the Clean Water Act's (CWA) goal of 100% fishable and swimmable rivers and streams. This is the same limit as the last permit at outfall #003.

Total Suspended Solids (TSS)
100 mg/L daily maximum and 30 mg/L monthly average per 40 CFR 423.12 for low volume waste sources; continued from the previous permit. The facility no longer is eligible for a NET limitation under 40 CFR 122.45(g) as there is no intake used. There are no Missouri WQS for this parameter, therefore the technology limit is the most stringent limit.

METALS:

Aluminum, Total Recoverable
Previous permit requirements were monitoring only; the facility reported between 2.98 and 1865 µg/L in the last permit term at outfall #003. This parameter has RP; see fact sheet Part III, REASONABLE POTENTIAL. The facility is not able to meet the new limits therefore an SOC is afforded; see fact sheet Part III SCHEDULE OF COMPLIANCE. An interim limit of 1865 µg/L is being implemented to assure no degradation is occurring in accordance with 10 CSR 20-7.031(3) utilizing best professional judgment per 10 CSR 20-7.015(8)(I)1; downstream uses are protected in accordance with 10 CSR 20-7.031(4)(E); and to continue proper site-wide operations and BMPs in accordance with 40 CFR 122.41(e). Technologies were reviewed for this pollutant under the steam electric category at the Industrial Wastewater Treatment Technology (IWTT) https://watersgeo.epa.gov/iwtt/guided-search database. Four technologies were identified to treat aluminum; however, none were for low volume waste sources and the data supplied by the facility indicate that none of the technologies are similar to current practices therefore no Steam-Electric TBEL will be implemented. The final limit will be equal to the acute water quality standard of 750 µg/L per 10 CSR 20-70.31 Table A. Because this facility discharges only stormwater, only the daily maximum is applied. See additional information under STORMWATER PERMITTING in Part III above.

Boron, Total Recoverable
Boron is a known pollutant of concern for coal ash. The facility reported 1.68 mg/L (1680 µg/L) in the application for renewal. Limits are implemented immediately; no SOC; the facility can meet the new limits. An SOC is not available to this parameter because this limit is implemented utilizing best professional judgment per 10 CSR 20-7.015(8)(I)1 to protect the irrigation use downstream per 10 CSR 20-7.031(4)(E); and to continue proper site-wide operations and BMPs in accordance with 40 CFR 122.41(e). Technologies were reviewed for this pollutant under the steam electric category at the Industrial Wastewater Treatment Technology (IWTT) https://watersgeo.epa.gov/iwtt/guided-search database. Seven technologies were identified to treat boron; however, none were for low volume waste sources (the technologies primarily served Flue Gas Desulphurization (FGD) wastewater which is very different than LVW sources therefore percent removal was not reviewed. However, one technology, chemical precipitation is similar to what the facility is currently managing. The effluent quality was set at 225,000 µg/L. The WQBEL is more stringent therefore shall be used per 10 CSR 20-7.015(9)(A) for most stringent and 40 CFR 122.44(b)(1) for most protective limit. The irrigation standard of 2000 µg/L per 10 CSR 20-7.031 Table A is applied as the daily maximum. Because this facility discharges only stormwater, only the daily maximum is applied. See additional information under STORMWATER PERMITTING in Part III above.

Chromium, Total
The facility will monitor and report total chromium; the total chromium value is required for the analytical method for hexavalent chromium therefore the facility will also report total chromium. There is currently no expectation that total chromium has RP.

Chromium, Hexavalent, Dissolved
Previous permit requirements were monitoring only at outfall #003; the facility reported between 2.4 and 50 µg/L in the last permit term at outfall #003. This parameter has RP; see fact sheet Part III, REASONABLE POTENTIAL. The facility is not able to meet the new limits therefore an SOC is afforded; see fact sheet Part III SCHEDULE OF COMPLIANCE. Technologies were reviewed for this pollutant under the steam electric category at the Industrial Wastewater Treatment Technology (IWTT) https://watersgeo.epa.gov/iwtt/guided-search database. Hexavalent chromium was not identified under the steam-electric category therefore no TBEL assessment is warranted.

An interim limit of 50 µg/L is being implemented. The final limit will be the acute WQS of 16 µg/L implemented as the daily maximum per 10 CSR 20-7.031 Table A. Because this facility discharges only stormwater, only the daily maximum is applied. See additional information under STORMWATER PERMITTING in Part III above.

OTHER:

Whole Effluent Toxicity (WET) Test, Chronic

Previous permit requirements were monitoring only at outfall #003; the facility reported 1 TUc in the last permit term. Using RPD, there is no reasonable potential to cause toxicity in the receiving stream based on the factors listed in Part III, REASONABLE POTENTIAL, and WHOLE EFFLUENT TOXICITY (WET) TEST. Monitoring discontinued because this outfall discharges only stormwater. See Part III STORMWATER PERMITTING for additional information.

APPENDICES

MIS19014

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor | Carol S. Comer, Director

MEMORANDUM

MIS19014
St. Louis County

DATE: September 24, 2018

TO: Pam Hackler, Environmental Scientist

FROM: Molly Starkey, Geologist, Environmental Geology Section, Geological Survey Program, MGS

Molly A Starkey

September 24, 2018

SUBJECT: Site Characterization Work Plan
Ameren Missouri Meramec Energy Center
38 24 13.49 Latitude, -90 20 25.74 Longitude, St. Louis County, Missouri

The Geological Survey Program (GSP) has reviewed the Site Characterization Work Plan for Ameren's Missouri-Meramec Energy Center at the request of the Water Protection Program. The proposed work plan is appropriate for the collection and interpretation of additional site data to develop a groundwater monitoring plan per the requirements of Special Condition 8.

The following comment is for consideration.

Section 2, Previous Investigations, states that '[r]eported depths therefore suggest the base of ponds are located either within or above the high plastic clays underlying the site.' This conclusion is based on a generalization of the subsurface. Boring logs for the installed monitoring wells that were submitted with the work plan document multiple locations in which the base of an ash pond is potentially in a coarser, higher permeability layer. Without more data on the depths of specific ponds and their proximity to known stratigraphy it is not reasonable to conclude that all ponds are separated from coarse alluvial sediments by high plastic clays.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2161.

MIS20073

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

MEMORANDUM

MIS20073
St. Louis County

DATE: June 03, 2020

TO: Pam Hackler

FROM: John Corley, Geologist, Environmental Geology Section, Geological Survey Program, MGS

June 03, 2020

SUBJECT: Ameren Missouri - Meramec Site Characterization Report. There are 8 attachments with this report. Thank you!
Ameren Meramec Site Characterization Report
38 24 11.78 Latitude, -90 20 25.42 Longitude, St. Louis County, Missouri

The Geological Survey Program (GSP) has reviewed the site characterization report for the Ameren Missouri Meramec Energy Center, prepared by GREDELL Engineering Resources, Inc., and dated April 2020.

The GSP has determined that the report has adequately described the site's geologic and hydrologic characteristics to fulfill the requirement of Special Condition 8(b) found in Missouri State Operating Permit MO-0000361.

However, in the event that anomalous groundwater elevation readings are encountered during the course of groundwater monitoring, and/or if contaminants are detected that exceed regulatory limits, additional wells may be necessary to properly determine the groundwater characteristics at the site.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2100.

MIS21044

Missouri Department of NATURAL RESOURCES dnr.mo.gov
Michael L. Parson, Governor — Carol S. Comer, Director

MEMORANDUM

MIS21044
St. Louis County

DATE: December 23, 2020

TO: Pam Hackler

FROM: John Corley, Geologist, Environmental Geology Section, Geological Survey Program, MGS

December 23, 2020

SUBJECT: Ameren Meramec draft Groundwater Monitoring Sampling and Analysis Plan
Ameren Meramec Draft GMSAP
38 24 8.06 Latitude, -90 20 24.01 Longitude, St. Louis County, Missouri

The Geological Survey Program (GSP) has reviewed the document 'Ameren Missouri Meramec Energy Center Draft Groundwater Monitoring, Sampling, and Analysis Plan', dated July 2020 and prepared by GREDELL Engineering Resources, Inc.

The GSP has determined that the report has adequately fulfilled the requirements of Special Condition 8(c) found in Missouri State Operating Permit MO-0000361. In the event that anomalous groundwater elevation readings are encountered during the course of groundwater monitoring, and/or if contaminants are detected in exceedance of regulatory limits, additional groundwater monitoring may be necessary to determine the extent of contaminant migrations.

The GSP has no further comments.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2100.

MIS21051

Missouri Department of NATURAL RESOURCES dnr.mo.gov
Michael L. Parson, Governor — Carol S. Comer, Director

MEMORANDUM

MIS21051
St. Louis County

DATE: January 12, 2021

TO: Pam Hackler

FROM: John Corley, Geologist, Environmental Geology Section, Geological Survey Program, MGS

January 12, 2021

SUBJECT: Ameren Meramec final GMSAP
Meramec Ameren final GMSAP
38 24 10.64 Latitude, -90 20 23.55 Longitude, St. Louis County, Missouri

The Geological Survey Program (GSP) has reviewed the document 'Ameren Missouri Meramec Energy Center Final Groundwater Monitoring, Sampling, and Analysis Plan', dated January 2021 and prepared by GREDELL Engineering Resources, Inc.

The GSP has determined that the report has adequately fulfilled the requirements of Special Condition 8(d) found in Missouri State Operating Permit MO-0000361. In the event that anomalous groundwater elevation readings are encountered during the course of groundwater monitoring, and/or if contaminants are detected in exceedance of regulatory limits, additional groundwater monitoring may be necessary to determine the extent of contaminant migrations.

The GSP has no further comments

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2100.

PART IV. 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.

PERMIT SYNCHRONIZATION

Permits are normally issued on a five-year term, but to achieve watershed synchronization some permits will need to be issued for less than the full five years as allowed by regulation. The intent is all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow the Department to explore a watershed based permitting effort at some point in the future.

- ✓ Industrial permits are not being synchronized.

PUBLIC NOTICE

The Department shall give public notice 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 or with 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 facility must be notified of the denial in writing. https://dnr.mo.gov/water/what-were-doing/public-notices The Department must issue public notice of a draft operating 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 wishing to submit comments regarding this proposed operating permit, 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. All comments must be in written form.

- ✓ The Public Notice period for this operating permit is March 15, 2024 through April 15, 2024. No comments were received.
- ✓ During finalization processes, it was noted that Tables 1 and 2 contained nutrient monitoring although no supporting information regarding sampling for nutrients was found in the fact sheet. This was a typographical error; Part III NUTRIENT MONITORING also indicates that no nutrient sampling is required for stormwater only. The fact sheet Part IV EFFLUENT LIMITS DETERMINATIONS also did not indicate nutrient monitoring was established. A second typo was noted in the fact sheet for TSS; the monitoring frequency is one per month, not weekly. Notes that were not applicable were removed. Pagination and formatting was completed.

DATE OF FACT SHEET: APRIL 23, 2023

PAM HACKLER, ENVIRONMENTAL SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
(573) 526-3386
pam.hackler@dnr.mo.gov

STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

Part I – General Conditions
Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
   a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
   b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.

2. **Monitoring Requirements**.
   a. Records of monitoring information shall include:
      i. The date, exact place, and time of sampling or measurements;
      ii. The individual(s) who performed the sampling or measurements;
      iii. The date(s) analyses were performed;
      iv. The individual(s) who performed the analyses;
      v. The analytical techniques or methods used; and
      vi. The results of such analyses.
   b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.

3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.

4. **Test Procedures**. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is "sufficiently sensitive" when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.

5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
   a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
   b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

Section B – Reporting Requirements

1. **Planned Changes.**
   a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
      i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
      ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
      iii. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
      iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.

2. **Non-compliance Reporting.**
   a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

b. The following shall be included as information which must be reported within 24 hours under this paragraph.
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
   ii. Any upset which exceeds any effluent limitation in the permit.
   iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.

c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.

3. **Anticipated Noncompliance**. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.

4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.

5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.

6. **Other Information**. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

7. **Discharge Monitoring Reports.**
   a. Monitoring results shall be reported at the intervals specified in the permit.
   b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
   c. Monitoring results shall be reported to the Department no later than the 28th day of the month following the end of the reporting period.

Section C – Bypass/Upset Requirements

1. **Definitions.**
   a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
   b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
   c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. **Bypass Requirements.**
   a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.
   b. Notice.
      i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
      ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
   c. Prohibition of bypass.
      i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
         1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
         2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
         3. The permittee submitted notices as required under paragraph 2. b. of this section.
      ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.

3. **Upset Requirements.**
   a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
   b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
      i. An upset occurred and that the permittee can identify the cause(s) of the upset;
      ii. The permitted facility was at the time being properly operated; and
      iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
      iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
   c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
   a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
   b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement

imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed $10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

2. **Duty to Reapply.**
   a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
   b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
   c. A permittees with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. **Proper Operation and Maintenance**. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

6. **Permit Actions.**
   a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
      i. Violations of any terms or conditions of this permit or the law;
      ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
      iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
      iv. Any reason set forth in the Law or Regulations.
   b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. **Permit Transfer.**
   a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
   b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
   c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.

8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.

10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
    a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
    c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
    d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.

12. **Closure of Treatment Facilities.**
    a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
    b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.

13. **Signatory Requirement.**
    a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
    b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
    c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.

14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.

June 30, 2022

Mr. Michael Abbott
Chief, Operating Permits Section
Missouri Department of Natural Resources
Water Pollution Control Branch
Permit Section
PO Box 176
Jefferson City, Mo 65102-1076

Dear Mr. Abbott,

RE: Meramec Energy Center NPDES Permit Reapplication MO-0000361

In accordance with State and Federal regulations, the following documents are included for the renewal application for Union Electric Company d/b/a Ameren Missouri Meramec Energy Center:

- Form A, C, D - Application for renewal of the NPDES permit
- Location Maps
- Attachments providing further details regarding information required in the application forms

Meramec Energy Center is planning to cease operations on December 31st, 2022. The enclosed application and attachments provide extensive details on the Meramec Energy Center after plant operations are halted, as well as activities planned during decommission.

Please contact me should you have any questions or need additional information.

Sincerely,

Meghan Maxwell

Meghan Maxwell
Consulting Environmental Scientist
Ameren Missouri

Enclosure

REC'D 06/30/2022 AP39715

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
FORM A – APPLICATION FOR NONDOMESTIC PERMIT UNDER MISSOURI CLEAN WATER LAW

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
JET PAY CONFIRMATION NUMBER	

PLEASE READ ALL THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.
SUBMITTAL OF AN INCOMPLETE APPLICATION MAY RESULT IN THE APPLICATION BEING RETURNED.

IF YOUR FACILITY IS ELIGIBLE FOR A NO EXPOSURE EXEMPTION:
Fill out the No Exposure Certification Form (Mo 780-2828): https://dnr.mo.gov/forms/780-2828-f.pdf

1. REASON FOR APPLICATION:

☑ a. This facility is now in operation under Missouri State Operating Permit (permit) MO – 0000361, is submitting an application for renewal, and there is no proposed increase in design wastewater flow. Annual fees will be paid when invoiced and there is no additional permit fee required for renewal.

☐ b. This facility is now in operation under permit MO – _____, is submitting an application for renewal, and there is a proposed increase in design wastewater flow. Antidegradation Review may be required. Annual fees will be paid when invoiced and there is no additional permit fee required for renewal.

☐ c. This is a facility submitting an application for a new permit (for a new facility). Antidegradation Review may be required. New permit fee is required.

☐ d. This facility is now in operation under Missouri State Operating Permit (permit) MO – _____ and is requesting a modification to the permit. Antidegradation Review may be required. Modification fee is required.

2. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
Ameren Missouri - Meramec Energy Center		314-992-7201	
ADDRESS (PHYSICAL)	**CITY**	**STATE**	**ZIP CODE**
8200 Fine Road	St. Louis	MO	63129

3. OWNER

NAME		TELEPHONE NUMBER WITH AREA CODE	
Ameren Missouri		314-992-7201	
EMAIL ADDRESS			
cgiesmann@ameren.com			
ADDRESS (MAILING)	**CITY**	**STATE**	**ZIP CODE**
PO Box 66149 MC602	St. Louis	MO	63166

4. CONTINUING AUTHORITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
Same as above			
EMAIL ADDRESS			
ADDRESS (MAILING)	**CITY**	**STATE**	**ZIP CODE**

5. OPERATOR CERTIFICATION

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE	
Same as above			
ADDRESS (MAILING)	**CITY**	**STATE**	**ZIP CODE**

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE NUMBER WITH AREA CODE
John Beck	Director Systems Engineering	314-992-7201
E-MAIL ADDRESS		
jbeck3@ameren.com		

7. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary.

NAME			
American Milling			
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1 Meramec Marine Road	Arnold	MO	63010

8. ADDITIONAL FACILITY INFORMATION

8.1 Legal Description of Outfalls. (Attach additional sheets if necessary.) See additional sheet

For Universal Transverse Mercator (UTM), use Zone 15 North referenced to North American Datum 1983 (NAD83)

001 _____¼ _____¼ Sec _____ T _____ R _____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

002 _____¼ _____¼ Sec _____ T _____ R _____ _____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

003 _____¼ SW ¼ Sec 3 T 42N R 6E St. Louis County
UTM Coordinates Easting (X): 731960 Northing (Y): 4254442

004 _____¼ _____¼ Sec _____ T _____ R _____ County
UTM Coordinates Easting (X): _____ Northing (Y): _____

Include all subsurface discharges and underground injection systems for permit consideration.

8.2 Primary Standard Industrial Classification (SIC) and Facility North American Industrial Classification System (NAICS) Codes.

Primary SIC 4911 and NAICS 221100 SIC _____ and NAICS _____
SIC _____ and NAICS _____ SIC _____ and NAICS _____

9. ADDITIONAL FORMS AND MAPS NECESSARY TO COMPLETE THIS APPLICATION

A. Is this permit for a manufacturing, commercial, mining, solid/hazardous waste, or silviculture facility? YES ☐ NO ☑
If yes, complete Form C.

B. Is the facility considered a "Primary Industry" under EPA guidelines (40 CFR Part 122, Appendix A) : YES ☑ NO ☐
If yes, complete Forms C and D.

C. Is wastewater land applied? YES ☐ NO ☑
If yes, complete Form I.

D. Are sludge, biosolids, ash, or residuals generated, treated, stored, or land applied? YES ☐ NO ☑
If yes, complete Form R.

E. Have you received or applied for any permit or construction approval under the CWA or any other environmental regulatory authority? YES ☐ NO ☑
If yes, please include a list of all permits or approvals for this facility:
Environmental Permits for this facility:_____

F. Do you use cooling water in your operations at this facility? Cooling water intake ceases Dec 31, 2022 YES ☐ NO ☑
If yes, please indicate the source of the water: _____

G. Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.

10. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data. **One of the following must be checked in order for this application to be considered complete.** Please visit https://dnr.mo.gov/env/wpp/edmr.htmfor information on the Department's eDMR system and how to register.

☐ - I will register an account online to participate in the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before any reporting is due, in compliance with the Electronic Reporting Rule.

☑ - I have already registered an account online to participate in the Department's eDMR system through MoGEM.

☐ - I have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.

☐ - The permit I am applying for does not require the submission of discharge monitoring reports.

11. FEES

Permit fees may be paid by attaching a check, or online by credit card or eCheck through the JetPay system. Use the URL provided to access JetPay and make an online payment:
For new permits: https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/591

For modifications: https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/596

12. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Ajay Arora - VP, Chief Renewable Dev Officer	314-613-9178
SIGNATURE	DATE SIGNED
Ajay Arora	06/27/2022

MO 780-1479 (04-21)

Meramec Energy Center

NPDES Permit MO-0000361

Missouri Department of Natural Resources Form A, Section 8.1
Legal Description of Outfalls, St. Louis County

Outfall	¼	¼	Sec	T	R	X, UTM	Y, UTM
005		SW	3	42N	6E	732805.5	4253548.8
006		SW	3	42N	6E	732981.2	4253667.7
007		SW	3	42N	6E	732956.3	4253681.5
008		SW	3	42N	6E	732368.8	4254579.0
009		SW	3	42N	6E	731877.1	4253544.8
010		SW	3	42N	6E	732404.6	4253676.2
011		SW	3	42N	6E	731833.4	4254012.0
012		SW	3	42N	6E	731779.4	4254197.9

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

FORM C – APPLICATION FOR DISCHARGE PERMIT – MANUFACTURING, COMMERCIAL, MINING, SILVICULTURE OPERATIONS, AND STORMWATER

GENERAL INFORMATION (PLEASE SEE INSTRUCTIONS)

1.0 NAME OF FACILITY

Ameren Missouri - Meramec Energy Center

1.1 THIS FACILITY IS OPERATING UNDER MISSOURI STATE OPERATING PERMIT (MSOP) NUMBER:

MO-0000361

1.2 IS THIS A NEW FACILITY? PROVIDE CONSTRUCTION PERMIT (CP) NUMBER IF APPLICABLE.

N/A

1.3 Describe the nature of the business, in detail. Identify the goods and services provided by the business. Include descriptions of all raw, intermediate, final products, byproducts, or waste products used in the production or manufacturing process, stored outdoors, loaded or transferred and any other pertinent information for potential sources of wastewater or stormwater discharges.

Steam Electric Power Plant

FLOWS, TYPE, AND FREQUENCY

2.0 Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in item B. Construct a water balance on the line drawing by showing average and maximum flows between intakes, operations, treatment units, evaporation, public sewers, and outfalls. If a water balance cannot by determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

2.1 For each outfall (1) below, provide: (2) a description of all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, stormwater runoff, and any other process or non-process wastewater, (3) the average flow and maximum flow (put max in parentheses) contributed by each operation and the sum of those operations, (4) the treatment received by the wastewater, and (5) the treatment type code. Continue on additional sheets if necessary.

1. OUTFALL NO.	2. OPERATION(S) CONTRIBUTING FLOW; INCLUDE ALL PROCESSES AND SUB PROCESSES AT EACH OUTFALL	3. AVERAGE FLOW AND (MAXIMUM FLOW), INCLUDE UNITS.	4. TREATMENT DESCRIPTION	5. TREATMENT CODES FROM TABLE A
003	Ash Retention Pond	Intermittent	Discharge	4A
	Stormwater from Bottom Ash Pond closure			
005	Combined Drain Sump Emerg. Discharge	0.0(1.985)MGD	Discharge	4A
006	Caisson Sump	Intermittent	Discharge	4A
007	Stormwater Runoff	Intermittent	Discharge	4A
008	Stormwater Runoff	Intermittent	Discharge	4A
009	Stormwater Runoff	Intermittent	Discharge	4A
010	Closure Water Treatment System	Varies	Discharge	4A
011	Stormwater Runoff	Intermittent	Discharge	4A
012	Stormwater Runoff	Intermittent	Discharge	4A

Attach additional pages if necessary.

2.2 INTERMITTENT DISCHARGES

Except for stormwater runoff, leaks, or spills, are any of the discharges described in items 2.0 or 2.1 intermittent or seasonal?

☐ Yes *(complete the following table)* ☑ No *(go to section 2.3)*

1. OUTFALL NUMBER	2. OPERATION(S) CONTRIBUTING FLOW	3. FREQUENCY		4. FLOW				C. DURATION *(in days)*
				A. FLOW RATE *(in mgd)*		B. TOTAL VOLUME (specify with units)		
		A. DAYS PER WEEK *(specify average)*	B. MONTHS PER YEAR *(specify average)*	1. MAXIMUM DAILY	2. LONG TERM AVERAGE	4. LONG TERM DAILY	3. MAXIMUM AVERAGE	

2.3 PRODUCTION

A. Does an effluent limitation guideline (ELG) promulgated by EPA under section 304 of the Clean Water Act apply to your facility? Indicate the part and subparts applicable.

☐ Yes 40 CFR_____ Subpart(s) _____ ☑ No *(go to section 2.5)*

B. Are the limitations in the effluent guideline(s) expressed in terms of production (or other measure of operation)? Describe in C below.

☐ Yes *(complete C.)* ☐ No *(go to section 2.5)*

C. If you answered "yes" to B, list the quantity representing an actual measurement of your maximum level of production, expressed in the terms and units used in the applicable effluent guideline and indicate the affected outfalls.

A. OUTFALL(S)	B. QUANTITY PER DAY	C. UNITS OF MEASURE	D. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*

2.4 IMPROVEMENTS

A. Are you required by any federal, state, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ Yes *(complete the following table)* ☐ No *(go to 2.6)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
			A. REQUIRED	B. PROJECTED

B. Optional: provide below or attach additional sheets describing water pollution control programs or other environmental projects which may affect discharges. Indicate whether each program is underway or planned, and indicate actual or planned schedules for construction. This may include proposed bmp projects for stormwater.

2.5 SLUDGE MANAGEMENT

Describe the removal of any industrial or domestic biosolids or sludges generated at your facility. Include names and contact information for any haulers used. Note the frequency, volume, and methods (incineration, landfilling, composting, etc) used. See Form A for additional forms which may need to be completed.

N/A

DATA COLLECTION AND REPORTING REQUIREMENTS FOR APPLICANTS

3.0 EFFLUENT (AND INTAKE) CHARACTERISTICS (SEE INSTRUCTIONS)

A. & B. See instructions before continuing – complete one Table 1 for **each outfall** (and intake) – annotate the outfall (intake) number or designation in the space provided. The facility is not required to complete intake data unless required by the department or rule.

C. Use the space below to list any pollutants listed in the instructions section 3.0 C. Table B which you know or have reason to believe is discharged or may be discharged from any outfall not listed in parts 3.0 A or B on Table 1. For every pollutant listed, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	3. OUTFALL(S)	4. ANALYTICAL RESULTS (INCLUDE UNITS)
Refer to Attachment D - Chemical Usage for chemcials used at Meramec Energy Center. Small amounts of asbestos are present in the facility. Therefore, incidental quantities may unavoidably reach the outfalls. However all asbestos removal and disposal activities are conducted in accordance with 40 CFR 61, Subpart M and OSHA Standard 26 CFR 1910, 1001 and 1926.			

3.1 Whole Effluent Toxicity Testing

A. To your knowledge, have any Whole Effluent Toxicity (WET) tests been performed on the facility discharges (or on receiving waters in relation to your discharge) within the last three years?

☑ Yes (go to 3.1 B) ☐ No (go to 3.2)

3.1 B

Disclose wet testing conditions, including test duration (chronic or acute), the organisms tested, and the testing results. Provide any results of toxicity identification evaluations (TIE) or toxicity reduction evaluations (TRE) if applicable. Please indicate the conclusions of the test(s) including any pollutants identified as causing toxicity and steps the facility is taking to remedy the toxicity.

Annual WET Tests have been performed on Outfall 003 with all results passing.

3.2 CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported herein, above, or on Table 1 performed by a contract laboratory or consulting firm?

☑ Yes (list the name, address, telephone number, and pollutants analyzed by each laboratory or firm.) ☐ No *(go to 4.0)*

A. LAB NAME	**B. ADDRESS**	**C. TELEPHONE** *(area code and number)*	**D. POLLUTANTS ANALYZED** *(list or group)*
PDC Laboratories	3278 N Highway 67 Florissant, MO 63033	800-333-3278	Volatile and Semi-volatile Organics

4.0 STORMWATER

4.1
Do you have industrial stormwater discharges from the site? If so, attach a site map outlining drainage areas served by each outfall. Indicate the following attributes within each drainage area: pavement or other impervious surfaces; buildings; outdoor storage areas; material loading and unloading areas; outdoor industrial activities; structural stormwater control measures; hazardous waste treatment, storage, and disposal units; and wells or springs in the area.

OUTFALL NUMBER	TOTAL AREA DRAINED (PROVIDE UNITS)	TYPES OF SURFACES (VEGETATED, STONE , PAVED, ETC)	BEST MANAGEMENT PRACTICES EMPLOYED; INCLUDE STRUCTURAL BMPS AND TREATMENT DESIGN FLOW FOR BMPS DESCRIBE HOW FLOW IS MEASURED
003		vegetated, paved	See Attachment A, Description of Outfalls
007		vegetated, paved	See Attachment A, Description of Outfalls
008		vegetated, paved	See Attachment A, Description of Outfalls
009		vegetated, paved	See Attachment A, Description of Outfalls
011		vegetated, gravel	See Attachment A, Description of Outfalls
012		vegetated, gravel	See Attachment A, Description of Outfalls

4.2 STORMWATER FLOWS
Provide the date of sampling with the flows, and how the flows were estimated.
See ATTACHMENT B for details

SIGNATORY REQUIREMENTS

5.0 CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Ajay Arora - VP, Chief Renewable Dev Officer	314-992-7201
SIGNATURE (SEE INSTRUCTIONS) 	DATE SIGNED 06/27/2022

Note: The below information was reported while Outfall 003 is a operational process water Outfall. See Attachment A for further details on Outfall 003 after plant closure.

SEE INSTRUCTIONS; PLEASE PRINT OR TYPE.
You may report some or all of this information on separate sheet *(use similar format)* instead of completing these pages.

FORM C TABLE 1 FOR 3.0 - ITEMS A AND B

EFFLUENT (AND INTAKE) CHARACTERISTICS — THIS OUTFALL IS: Stormwater Retention Pond — OUTFALL NO. 003

3.0 PART A – You must provide the results of at least one analysis for every pollutant in Part A. Complete one table for each outfall or proposed outfall. See instructions.

1. POLLUTANT	2. VALUES							3. UNITS *(specify if blank)*	
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
A. Biochemical Oxygen Demand, 5-day (BOD_5)	2.1	20.14					1	mg/L	lb/day
B. Chemical Oxygen Demand (COD)	12.2	117.0					1	mg/L	lb/day
C. Total Organic Carbon (TOC)	4.2	40.3					1	mg/L	lb/day
D. Total Suspended Solids (TSS)	13	124.7					1	mg/L	lb/day
E. Ammonia as N	0.2	1.9					1	mg/L	lb/day
F. Flow	VALUE		VALUE 8.41		VALUE 1.15		193	MILLIONS OF GALLONS PER DAY (MGD)	
G. Temperature *(winter)*	VALUE 46.1		VALUE		VALUE		4	°F	
H. Temperature *(summer)*	VALUE		VALUE		VALUE			°F	
I. pH	MINIMUM 6.51		MAXIMUM 8.65		AVERAGE		185	STANDARD UNITS (SU)	

3.0 PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark Column 2A for any pollutant, you must provide the results for at least one analysis for the pollutant. Complete one table for each outfall (intake). Provide results for additional parameters not listed here in Part 3.0 C.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants											
A. Alkalinity ($CaCO_3$)		x	MINIMUM		MINIMUM		MINIMUM				
B. Bromide (24959-67-9)	x		0.1	0.95					1	mg/L	lb/day
C. Chloride (16887-00-6)	x		22.6	217					1	mg/L	lb/day
D. Chlorine, Total Residual		x	<0.05	<0.48					1	mg/L	lb/day
E. Color		x									
F. Conductivity		x									
F. Cyanide, Amenable to Chlorination		x	3.2	30.7					1	mg/L	lb/day

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants (Continued)											
G. *E. coli*	x		52						4	MPN/100m	
H. Fluoride (16984-48-8)	x		0.33	3.17					1	mg/L	lb/day
I. Nitrate plus Nitrate *(as N)*	x		1.4	13.5					1	mg/L	lb/day
J. Kjeldahl, Total (as N)	x		0.8	7.7					1	mg/L	lb/day
K. Nitrogen, Total Organic *(as N)*	x		0.6	5.8					1	mg/L	lb/day
L. Oil and Grease		x	<1	<9.6					1	mg/L	lb/day
M. Phenols, Total	x		10.2	97.8					1	mg/L	lb/day
N. Phosphorus *(as P),* Total (7723-14-0)		x	<0.05	<0.48					1	mg/L	lb/day
O. Sulfate *(as SO^4)* (14808-79-8)	x		109	1045					1	mg/L	lb/day
P. Sulfide *(as S)*		x									
Q. Sulfite (as SO^3) (14265-45-3)		x									
R. Surfactants	x		0.1	0.96					1	mg/L	lb/day
S. Trihalomethanes, Total		x									
Subpart 2 – Metals											
1M. Aluminum, Total Recoverable (7429-90-5)	x		0.34	3.3					1	mg/L	lb/day
2M. Antimony, Total Recoverable (7440-36-9)		x									
3M. Arsenic, Total Recoverable (7440-38-2)	x		<0.008	<0.08					1	mg/L	lb/day
4M. Barium, Total Recoverable (7440-39-3)	x		0.15	1.43					1	mg/L	lb/day
5M. Beryllium, Total Recoverable (7440-41-7)		x									
6M. Boron, Total Recoverable (7440-42-8)	x		1.68	16.11					1	mg/L	lb/day
7M. Cadmium, Total Recoverable (7440-43-9)		x	<0.001	<0.01					1	mg/L	lb/day
8M. Chromium III Total Recoverable (16065-83-1)		x	<0.05	<0.48					1	mg/L	lb/day
9M. Chromium VI, Dissolved (18540-29-9)		x									
10M. Cobalt, Total Recoverable (7440-48-4)		x	<0.05	<0.48					1	mg/L	lb/day

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 2 – Metals (Continued)											
11M. Copper, Total Recoverable (7440-50-8)		x									
12M. Iron, Total Recoverable (7439-89-6)	x		0.16	1.53					1	mg/L	lb/day
13M. Lead, Total Recoverable (7439-92-1)		x									
14M. Magnesium, Total Recoverable (7439-95-4)	x		12.2	117					1	mg/L	lb/day
15M. Manganese, Total Recoverable (7439-96-5)	x		0.15	1.44					1	mg/L	lb/day
16M. Mercury, Total Recoverable (7439-97-6)		x									
17M. Methylmercury (22967926)		x									
18M. Molybdenum, Total Recoverable (7439-98-7)	x		0.05	0.48					1	mg/L	lb/day
19M. Nickel, Total Recoverable (7440-02-0)		x	0.01	0.09					1	mg/L	lb/day
20M. Selenium, Total Recoverable (7782-49-2)		x									
21M. Silver, Total Recoverable (7440-22-4)		x									
22M. Thallium, Total Recoverable (7440-28-0)		x									
23M. Tin, Total Recoverable (7440-31-5)		x									
24M. Titanium, Total Recoverable (7440-32-6)	x		0.002	0.02					1	mg/L	lb/day
25M. Zinc, Total Recoverable (7440-66-6)	x		0.004	0.04					1	mg/L	lb/day
Subpart 3 – Radioactivity											
1R. Alpha Total		x									
2R. Beta Total		x									
3R. Radium Total		x									
4R. Radium 226 plus 228 Total		x									

SEE INSTRUCTIONS; PLEASE PRINT OR TYPE.
You may report some or all of this information on separate sheet *(use similar format)* instead of completing these pages.

FORM C TABLE 1 FOR 3.0 - ITEMS A AND B

EFFLUENT (AND INTAKE) CHARACTERISTICS THIS OUTFALL IS: Stormwater Runoff OUTFALL NO. 007

3.0 PART A – You must provide the results of at least one analysis for every pollutant in Part A. Complete one table for each outfall or proposed outfall. See instructions.

1. POLLUTANT	2. VALUES							3. UNITS *(specify if blank)*	
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
A. Biochemical Oxygen Demand, 5-day (BOD_5)	5	<0.8					4	mg/L	lb/day
B. Chemical Oxygen Demand (COD)	17	3.3					4	mg/L	lb/day
C. Total Organic Carbon (TOC)	6.0	0.93					4	mg/L	lb/day
D. Total Suspended Solids (TSS)	5.0	3.3					4	mg/L	lb/day
E. Ammonia as N	0.3	0.07					4	mg/L	lb/day
F. Flow	VALUE 0.08		VALUE		VALUE		1	MILLIONS OF GALLONS PER DAY (MGD)	
G. Temperature *(winter)*	VALUE		VALUE		VALUE			°F	
H. Temperature *(summer)*	VALUE 56.3		VALUE		VALUE		4	°F	
I. pH	MINIMUM 7.4		MAXIMUM 7.4		AVERAGE		4	STANDARD UNITS (SU)	

3.0 PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark Column 2A for any pollutant, you must provide the results for at least one analysis for the pollutant. Complete one table for each outfall (intake). Provide results for additional parameters not listed here in Part 3.0 C.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants											
A. Alkalinity ($CaCO_3$)		X	MINIMUM		MINIMUM		MINIMUM				
B. Bromide (24959-67-9)		X									
C. Chloride (16887-00-6)		X									
D. Chlorine, Total Residual		X	<0.05	<0.03					4	mg/L	lb/d
E. Color		X									
F. Conductivity		X									
F. Cyanide, Amenable to Chlorination		X									

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants (Continued)											
G. *E. coli*		x									
H. Fluoride (16984-48-8)		x									
I. Nitrate plus Nitrate *(as N)*	x		1.1	0.93					1	mg/L	lb/d
J. Kjeldahl, Total (as N)	x		1.5	0.73					1	mg/L	lb/d
K. Nitrogen, Total Organic *(as N)*	x		1.2	0.6					1	mg/L	lb/d
L. Oil and Grease		x	<1.0	<0.67					1	mg/L	lb/d
M. Phenols, Total		x									
N. Phosphorus *(as P),* Total (7723-14-0)		x	<0.1	<0.1					1	mg/L	lb/d
O. Sulfate *(as SO^4)* (14808-79-8)	x		44.2	41.2					1	mg/L	lb/d
P. Sulfide *(as S)*		x									
Q. Sulfite (as SO^3) (14265-45-3)		x									
R. Surfactants		x									
S. Trihalomethanes, Total		x									
Subpart 2 – Metals											
1M. Aluminum, Total Recoverable (7429-90-5)		x	0.24	0.18					1	mg/L	lb/d
2M. Antimony, Total Recoverable (7440-36-9)		x									
3M. Arsenic, Total Recoverable (7440-38-2)		x									
4M. Barium, Total Recoverable (7440-39-3)		x									
5M. Beryllium, Total Recoverable (7440-41-7)		x									
6M. Boron, Total Recoverable (7440-42-8)		x									
7M. Cadmium, Total Recoverable (7440-43-9)		x									
8M. Chromium III Total Recoverable (16065-83-1)		x									
9M. Chromium VI, Dissolved (18540-29-9)		x									
10M. Cobalt, Total Recoverable (7440-48-4)		x									

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 2 – Metals (Continued)											
11M. Copper, Total Recoverable (7440-50-8)		X	<0.001	<0.001					1	mg/L	lb/d
12M. Iron, Total Recoverable (7439-89-6)		X	0.27	0.22					1	mg/L	lb/d
13M. Lead, Total Recoverable (7439-92-1)		X									
14M. Magnesium, Total Recoverable (7439-95-4)		X									
15M. Manganese, Total Recoverable (7439-96-5)		X									
16M. Mercury, Total Recoverable (7439-97-6)		X									
17M. Methylmercury (22967926)		X									
18M. Molybdenum, Total Recoverable (7439-98-7)		X									
19M. Nickel, Total Recoverable (7440-02-0)		X									
20M. Selenium, Total Recoverable (7782-49-2)		X									
21M. Silver, Total Recoverable (7440-22-4)		X									
22M. Thallium, Total Recoverable (7440-28-0)		X									
23M. Tin, Total Recoverable (7440-31-5)		X									
24M. Titanium, Total Recoverable (7440-32-6)		X									
25M. Zinc, Total Recoverable (7440-66-6)		X	0.10	0.09					1	mg/L	lb/d
Subpart 3 – Radioactivity											
1R. Alpha Total		X									
2R. Beta Total		X									
3R. Radium Total		X									
4R. Radium 226 plus 228 Total		X									

SEE INSTRUCTIONS; PLEASE PRINT OR TYPE.
You may report some or all of this information on separate sheet *(use similar format)* instead of completing these pages.

FORM C TABLE 1 FOR 3.0 - ITEMS A AND B

EFFLUENT (AND INTAKE) CHARACTERISTICS THIS OUTFALL IS: Stormwater Runoff OUTFALL NO. 008

3.0 PART A – You must provide the results of at least one analysis for every pollutant in Part A. Complete one table for each outfall or proposed outfall. See instructions.

1. POLLUTANT	2. VALUES							3. UNITS *(specify if blank)*	
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
A. Biochemical Oxygen Demand, 5-day (BOD_5)	5	50.0					1	mg/L	lb/day
B. Chemical Oxygen Demand (COD)	21	21.6					1	mg/L	lb/day
C. Total Organic Carbon (TOC)	8.6	86.1					1	mg/L	lb/day
D. Total Suspended Solids (TSS)	16	160.1					1	mg/L	lb/day
E. Ammonia as N	<0.1	<1.0					1	mg/L	lb/day
F. Flow	VALUE 1.2		VALUE		VALUE		4	MILLIONS OF GALLONS PER DAY (MGD)	
G. Temperature *(winter)*	VALUE		VALUE		VALUE			°F	
H. Temperature *(summer)*	VALUE		VALUE		VALUE		4	°F	
I. pH	MINIMUM 7.3		MAXIMUM 7.3		AVERAGE		4	STANDARD UNITS (SU)	

3.0 PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark Column 2A for any pollutant, you must provide the results for at least one analysis for the pollutant. Complete one table for each outfall (intake). Provide results for additional parameters not listed here in Part 3.0 C.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants											
A. Alkalinity ($CaCO_3$)		X	MINIMUM		MINIMUM		MINIMUM				
B. Bromide (24959-67-9)		X									
C. Chloride (16887-00-6)		X									
D. Chlorine, Total Residual		X	<0.05						4	mg/L	
E. Color		X									
F. Conductivity		X									
F. Cyanide, Amenable to Chlorination		X									

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants (Continued)											
G. *E. coli*		X									
H. Fluoride (16984-48-8)		X									
I. Nitrate plus Nitrate *(as N)*	X		1.2	12.2					1	mg/L	lb/d
J. Kjeldahl, Total (as N)	X		0.3	3.1					1	mg/L	lb/d
K. Nitrogen, Total Organic *(as N)*	X		0.2	2.2					1	mg/L	lb/d
L. Oil and Grease		X									
M. Phenols, Total		X									
N. Phosphorus *(as P),* Total (7723-14-0)		X	0.23	2.3					1	mg/L	lb/d
O. Sulfate *(as SO^4)* (14808-79-8)	X		132	1322					1	mg/L	lb/d
P. Sulfide *(as S)*		X									
Q. Sulfite (as SO^3) (14265-45-3)		X									
R. Surfactants		X									
S. Trihalomethanes, Total		X									
Subpart 2 – Metals											
1M. Aluminum, Total Recoverable (7429-90-5)		X	0.79	7.9					1	mg/L	lb/d
2M. Antimony, Total Recoverable (7440-36-9)		X									
3M. Arsenic, Total Recoverable (7440-38-2)		X									
4M. Barium, Total Recoverable (7440-39-3)		X									
5M. Beryllium, Total Recoverable (7440-41-7)		X									
6M. Boron, Total Recoverable (7440-42-8)		X									
7M. Cadmium, Total Recoverable (7440-43-9)		X									
8M. Chromium III Total Recoverable (16065-83-1)		X									
9M. Chromium VI, Dissolved (18540-29-9)		X									
10M. Cobalt, Total Recoverable (7440-48-4)		X									

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 2 – Metals (Continued)											
11M. Copper, Total Recoverable (7440-50-8)		x	<0.001	<0.01					1	mg/L	lb/d
12M. Iron, Total Recoverable (7439-89-6)	x		1.16	11.6					1	mg/L	lb/d
13M. Lead, Total Recoverable (7439-92-1)		x									
14M. Magnesium, Total Recoverable (7439-95-4)		x									
15M. Manganese, Total Recoverable (7439-96-5)		x									
16M. Mercury, Total Recoverable (7439-97-6)		x									
17M. Methylmercury (22967926)		x									
18M. Molybdenum, Total Recoverable (7439-98-7)		x									
19M. Nickel, Total Recoverable (7440-02-0)		x									
20M. Selenium, Total Recoverable (7782-49-2)		x									
21M. Silver, Total Recoverable (7440-22-4)		x									
22M. Thallium, Total Recoverable (7440-28-0)		x									
23M. Tin, Total Recoverable (7440-31-5)		x									
24M. Titanium, Total Recoverable (7440-32-6)		x									
25M. Zinc, Total Recoverable (7440-66-6)		x	0.03	0.3					1	mg/L	lb/d
Subpart 3 – Radioactivity											
1R. Alpha Total		x									
2R. Beta Total		x									
3R. Radium Total		x									
4R. Radium 226 plus 228 Total		x									

SEE INSTRUCTIONS; PLEASE PRINT OR TYPE.
You may report some or all of this information on separate sheet *(use similar format)* instead of completing these pages.

FORM C TABLE 1 FOR 3.0 - ITEMS A AND B

EFFLUENT (AND INTAKE) CHARACTERISTICS THIS OUTFALL IS: Stormwater Runoff OUTFALL NO. 009

3.0 PART A – You must provide the results of at least one analysis for every pollutant in Part A. Complete one table for each outfall or proposed outfall. See instructions.

1. POLLUTANT	2. VALUES							3. UNITS *(specify if blank)*	
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS			
A. Biochemical Oxygen Demand, 5-day (BOD_5)	2.7	1.13					1	mg/L	lb/day
B. Chemical Oxygen Demand (COD)	4.9	2.04					1	mg/L	lb/day
C. Total Organic Carbon (TOC)	2.2	0.92					1	mg/L	lb/day
D. Total Suspended Solids (TSS)	12.8	5.3					1	mg/L	lb/day
E. Ammonia as N	<0.1	<0.04					1	mg/L	lb/day
F. Flow	VALUE 0.05		VALUE		VALUE		4	MILLIONS OF GALLONS PER DAY (MGD)	
G. Temperature *(winter)*	VALUE		VALUE		VALUE			°F	
H. Temperature *(summer)*	VALUE		VALUE		VALUE		4	°F	
I. pH	MINIMUM 7.4		MAXIMUM 7.4		AVERAGE		4	STANDARD UNITS (SU)	

3.0 PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark Column 2A for any pollutant, you must provide the results for at least one analysis for the pollutant. Complete one table for each outfall (intake). Provide results for additional parameters not listed here in Part 3.0 C.

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants											
A. Alkalinity ($CaCO_3$)		X	MINIMUM		MINIMUM		MINIMUM				
B. Bromide (24959-67-9)		X									
C. Chloride (16887-00-6)		X									
D. Chlorine, Total Residual		X	<0.05	<0.02					1	mg/L	lb/d
E. Color		X									
F. Conductivity		X									
F. Cyanide, Amenable to Chlorination		X									

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants (Continued)											
G. *E. coli*		X									
H. Fluoride (16984-48-8)		X									
I. Nitrate plus Nitrate *(as N)*	X		2.6	1.08					1	mg/L	lb/d
J. Kjeldahl, Total (as N)	X		1.1	0.45					1	mg/L	lb/d
K. Nitrogen, Total Organic *(as N)*	X		1.2	0.5					1	mg/L	lb/d
L. Oil and Grease		X	<1.0	<0.42					1	mg/L	lb/d
M. Phenols, Total		X									
N. Phosphorus *(as P),* Total (7723-14-0)		X	<0.01	<0.01					1	mg/L	lb/d
O. Sulfate *(as SO^4)* (14808-79-8)	X		4.2	1.75					1	mg/L	lb/d
P. Sulfide *(as S)*		X									
Q. Sulfite (as SO^3) (14265-45-3)		X									
R. Surfactants		X									
S. Trihalomethanes, Total		X									
Subpart 2 – Metals											
1M. Aluminum, Total Recoverable (7429-90-5)		X									
2M. Antimony, Total Recoverable (7440-36-9)		X									
3M. Arsenic, Total Recoverable (7440-38-2)		X									
4M. Barium, Total Recoverable (7440-39-3)		X									
5M. Beryllium, Total Recoverable (7440-41-7)		X									
6M. Boron, Total Recoverable (7440-42-8)		X									
7M. Cadmium, Total Recoverable (7440-43-9)		X									
8M. Chromium III Total Recoverable (16065-83-1)		X									
9M. Chromium VI, Dissolved (18540-29-9)		X									
10M. Cobalt, Total Recoverable (7440-48-4)		X									

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 2 – Metals (Continued)											
11M. Copper, Total Recoverable (7440-50-8)		X									
12M. Iron, Total Recoverable (7439-89-6)		X									
13M. Lead, Total Recoverable (7439-92-1)		X									
14M. Magnesium, Total Recoverable (7439-95-4)		X									
15M. Manganese, Total Recoverable (7439-96-5)		X									
16M. Mercury, Total Recoverable (7439-97-6)		X									
17M. Methylmercury (22967926)		X									
18M. Molybdenum, Total Recoverable (7439-98-7)		X									
19M. Nickel, Total Recoverable (7440-02-0)		X									
20M. Selenium, Total Recoverable (7782-49-2)		X									
21M. Silver, Total Recoverable (7440-22-4)		X									
22M. Thallium, Total Recoverable (7440-28-0)		X									
23M. Tin, Total Recoverable (7440-31-5)		X									
24M. Titanium, Total Recoverable (7440-32-6)		X									
25M. Zinc, Total Recoverable (7440-66-6)		X									
Subpart 3 – Radioactivity											
1R. Alpha Total		X									
2R. Beta Total		X									
3R. Radium Total		X									
4R. Radium 226 plus 228 Total		X									

APPLICATION FOR DISCHARGE PERMIT
FORM D – PRIMARY INDUSTRIES

TABLE II

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000361	003

1.30 If you are a primary industry and this outfall contains process wastewater, refer to Table A in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-A for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. Mark "X" in column 2-B for each pollutant you know or have reason to believe is present. Mark "X" in column 2-C for each pollutant you believe to be absent. If you mark either columns 2-A or 2-B for any pollutant, you must provide the results of at least one analysis for that pollutant. Note that there are seven pages to this part, please review each carefully. Complete one table (*all seven pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TEST-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-9)			✓												1
2M. Arsenic, Total (7440-38-2)		✓		<0.008	<0.08					1	mg/L	lb/d			1
3M. Beryllium, Total (7440-41-7)			✓												1
4M. Cadmium, Total (7440-43-9)			✓												1
5M. Chromium III (16065-83-1)			✓												1
6M. Chromium VI (18540-29-9)			✓	<5.0	<47.9					1	ug/L	lbs/d			1
7M. Copper, Total (7440-50-8)			✓												1
8M. Lead, Total (7439-92-1)			✓												1
9M. Magnesium Total (7439-95-4)		✓		12.2	117					1	mg/L	lb/d			1
10M. Mercury, Total (7439-97-6)			✓												1
11M. Molybdenum Total (7439-98-7)		✓		0.05	0.48					1	mg/L	lb/d			1
12M. Nickel, Total (7440-02-0)			✓												1
13M. Selenium, Total (7782-49-2)			✓												1
14M. Silver, Total (7440-22-4)			✓												1
15M. Thallium, Total (7440-28-0)			✓												1
16M. Tin Total (7440-31-5)			✓												1
17M. Titanium Total (7440-32-6)		✓		0.002	0.02					1	mg/L	lb/d			1
18M. Zinc, Total (7440-66-6)		✓		0.004	0.04					1	mg/L	lb/d			1

CONTINUED FROM PAGE 3

19M. Cyanide, Amenable to Chlorination	☐	☐	☑													
20M. Phenols, Total	☐	☐	☑													
DIOXIN																
2,3,7,8 – Tetra – chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☑	**DESCRIBE RESULTS**												

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☑	☐	☑	<50						1	ug/L	lbs/d	<50		1
2V. Acrylonitrile (107-13-1)	☑	☐	☑	<50						1	ug/L	lbs/d	<50		1
3V. Benzene (71-43-2)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
4V. Bis (*Chloromethyl*) Ether (542-88-1)	☑	☐	☑	<50						1	ug/L	lbs/d	<50		1
5V. Bromoform (75-25-2)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
6V. Carbon Tetrachloride (56-23-5)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
7V. Chlorobenzene (108-90-7)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
8V. Chlorodibromomethane (124-48-1)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
9V. Chloroethane (75-00-3)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
10V. 2-Chloroethylvinyl Ether (110-75-8)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
11V. Chloroform (67-66-3)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
12V. Dichlorobromomethane (75-27-4)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
13V. Dichloro-difluoromethane (75-71-8)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
14V. 1,1 – Dichloroethane (75-34-3)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
15V. 1,2 – Dichloroethane (107-06-2)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
16V. 1,1 – Dichloroethylene (75-35-4)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
17V. 1,3 – Dichloropropane (78-87-5)	☑	☐	☑	<15.0						1	ug/L	lbs/d	<15.0		1
18V. 1,2 –Dichloropropylene (542-75-6)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
19V. Ethylbenzene (100-41-4)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
20V. Methyl Bromide (74-83-9)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1
21V. Methyl Chloride (74-87-3)	☑	☐	☑	<5.0						1	ug/L	lbs/d	<5.0		1

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000361	003

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC.MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
23V. 1,1,2,2 – Tetra-chloroethane (79-34-5)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
24V. Tetrachloroethylene (127-18-4)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
25V. Toluene (108-88-3)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
26V. 1,2 – Trans Dichloroethylene (156-60-5)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
27V. 1,1,1 – Tri – chloroethane (71-55-6)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
28V. 1,1,2 – Tri-chloroethane (79-00-5)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
29V. Trichloro – ethylene (79-01-6)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
30V. Trichloro – fluoromethane (75-69-4)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
31V. Vinyl Chloride (75-01-4)	✓		✓	<5.0						1	ug/L	lbs/d	<5.0		1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2 – Chlorophenol (95-57-8)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
2A. 2,4 – Dichloro – phenol (120-83-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
3A. 2,4 – Dimethyl – phenol (105-67-9)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
4A. 4,6 – Dinitro - O-Cresol (534-52-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
5A. 2,4 – Dinitro – phenol (51-28-5)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
6A. 2-Nitrophenol (88-75-5)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
7A. 4-Nitrophenol (100-02-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
8A. P – Chloro – M Cresol (59-50-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
9A. Pentachloro – phenol (87-86-5)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
10A. Phenol (108-952)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
11A. 2,4,6 – Trichloro-phenol (88-06-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
12A. 2 - methyl – 4,6 dinitrophenol (534-52-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
2B. Acenaphtylene (208-96-8)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
3B. Anthracene (120-12-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
4B. Benzidine (92-87-5)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
5B. Benzo (a) Anthracene (56-55-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
6B. Benzo (a) Pyrene (50-32-8)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
7B. 3,4 – Benzofluoranthene (205-99-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
8B. Benzo (ghi) Perylene (191-24-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
9B. Benzo (k) Fluoranthene (207-08-9)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
10B. Bis (2-Chloroethoxy) Methane (111-91-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
11B. Bis (2-Chloroethyl) Ether (111-44-4)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
12B. Bis (2-Chloroisopropyl) Ether (39638-32-9)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
13B. Bis (2-Ethylhexyl) Phthalate (117-81-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
15B. Butyl Benzyl Phthalate (85-68-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
16B. 2-Chloronaphthalene (91-58-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
18B. Chrysene (218-01-9)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
19B. Dibenzo (a.h) Anthracene (53-70-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
20B. 1,2 – Dichlorobenzene (95-50-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
21B. 1,3 – Dichlorobenzene (541-73-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1

CONTINUED FROM PAGE 5

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000361	003

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
22B. 1, 4-Dichlorobenzene (106-46-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
23B. 3, 3'-Dichlorobenzidine (91-94-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
24B. Diethyl Phthalate (84-66-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
25B. Dimethyl Phthalate (131-11-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
26B. Di-N-butyl Phthalate (84-74-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
27B. 2,4-Dinitrotoluene (121-14-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
28B. 2,6-Dinitrotoluene (606-20-2)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
29B. Di-N-Octyphthalate (117-84-0)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
30B. 1,2-Diphenylhydrazine (*as Azobenzene)* (122-66-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
31B. Fluoranthene (206-44-0)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
32B. Fluorene (86-73-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
33B. Hexachlorobenzene (87-68-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
34B. Hexachlorobutadiene (87-68-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
35B. Hexachloro-cyclopentadiene (77-47-4)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
36B. Hexachloroethane (67-72-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
37B. Indeno (1,2,3-c-d) Pyrene (193-39-5)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
38B. Isophorone (78-59-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
39B. Naphthalene (91-20-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
40B. Nitrobenzene (98-95-3)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
41B. N-Nitro-sodimethylamine (62-75-9)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TES-ING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
42B. N-Nitroso N-Propylamine (621-64-7)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
43B. N-Nitro-sodiphenylamine (86-30-6)	✓		✓	<10.0						1	ug/L	lbs/d	<3.2		1
44B. Phenanthrene (85-01-8)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
45B. Pyrene (129-00-0)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
46B. 1,2,4-Tri chlorobenzene (120-82-1)	✓		✓	<10.0						1	ug/L	lbs/d	<10.0		1
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)			✓												
2P. α-BHC (319-84-6)			✓												
3P. β-BHC (319-84-6)			✓												
4P. γ-BHC (58-89-9)			✓												
5P. δ-BHC (319-86-8)			✓												
6P. Chlordane (57-74-9)			✓												
7P. 4,4'-DDT (50-29-3)			✓												
8P. 4,4'-DDE (72-55-9)			✓												
9P. 4,4'-DDD (72-54-8)			✓												
10P. Dieldrin (60-57-1)			✓												
11P. α-Endosulfan (115-29-7)			✓												
12P. β-Endosultan (115-29-7)			✓												
13P. Endosulfan Sulfate (1031-07-8)			✓												
14P. Endrin (72-20-8)			✓												
15P. Endrin Aldehyde (7421-93-4)			✓												
16P. Heptachlor (76-44-8)			✓												

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CONTINUED FROM PAGE 7

NPDES # (*IF ASSIGNED*)	OUTFALL NUMBER
MO-0000361	003

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	A. TESTING REQUIRED	B. BELIEVED PRESENT	C. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (*if available*)		C. LONG TERM AVRG. VALUE (*if available*)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICISES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	✓												
18P. PCB-1242 (53469-21-9)	☐	☐	✓												
19P. PBC-1254 (11097-69-1)	☐	☐	✓												
20P. PCB-1221 (11104-28-2)	☐	☐	✓												
21P. PCB-1232 (11141-16-5)	☐	☐	✓												
22P. PCB-1248 (12672-29-6)	☐	☐	✓												
23P. PCB-1260 (11096-82-5)	☐	☐	✓												
24P. PCB-1016 (12674-11-2)	☐	☐	✓												
25P. Toxaphene (8001-35-2)	☐	☐	✓												
J. RADIOACTIVITY															
(1) Alpha Total	☐	☐	✓												
(2) Beta Total	☐	☐	✓												
(3) Radium Total	☐	☐	✓												
(4) Radium 226 Total	☐	☐	✓												

2.00 POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

A. IS ANY POLLUTANT LISTED IN ITEM 1.30 A SUBSTANCE OR A COMPONENT OF A SUBSTANCE WHICH YOU DO OR EXPECT THAT YOU WILL OVER THE NEXT FIVE YEARS USE OR MANUFACTURE AS AN INTERMEDIATE OR FINAL PRODUCT OR BYPRODUCT?

☐ **YES** *(LIST ALL SUCH POLLUTANTS BELOW)* ■ **NO** *(GO TO B)*

B. ARE YOUR OPERATIONS SUCH THAT YOUR RAW MATERIALS, PROCESSES OR PRODUCTS CAN REASONABLE BE EXPECTED TO VARY SO THAT YOUR DISCHARGES OF POLLUTANTS MAY DURING THE NEXT FIVE YEARS EXCEED TWO TIMES THE MAXIMUM VALUES REPORTED IN ITEM 1.30?

☐ **YES** *(COMPLETE C BELOW)* ■ **NO** *(GO TO SECTION 3.00)*

C. IF YOU ANSWERED "YES" TO ITEM B, EXPLAIN BELOW AND DESCRIBE IN DETAIL THE SOURCES AND EXPECTED LEVELS OF SUCH POLLUTANTS THAT YOU ANTICIPATE WILL BE DISCHARGED FROM EACH OUTFALL OVER THE NEXT FIVE YEARS, TO THE BEST OF YOUR ABILIITY AT THIS TIME. CONTINUE ON ADDITIONAL SHEETS IF YOU NEED MORE SPACE.

3.00 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED IN 1.30 PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

■ **YES** *(LIST THE NAME, ADDRESS, AND TELEPHONE NUMBER OF, AND ANALYZED BY, EACH SUCH LABORATORY OR FIRM BELOW)*

☐ **NO** *(GO TO SECTION 4.00)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code and number)*	D. POLLUTANTS ANALYZED *(list)*
PDC Laboratories	3278 N Highway 67	(800) 333-3278	Volatile and
			Semi Volatile Organics

4.00 CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	PHONE NUMBER (AREA CODE AND NUMBER)
Ajay Arora - VP, Chief Renewable Dev Officer	314-992-7201
SIGNATURE 	DATE SIGNED 06/27/2022

2022 Meramec Energy Center
NPDES Permit Reapplication

Attachment Index

***Note** – All following Attachments reflect Meramec Energy Center after operations cease on December 31, 2022

Attachment A
Description of Site and Designated Outfalls

General Site Description

The Ameren Missouri Meramec Energy Center is an electric generating facility that initially commenced operations in 1953 as a baseload plant. The plant is located in St. Louis County, near the confluence of the Meramec and Mississippi Rivers. The plant site encompasses approximately 420 acres. Meramec Energy Center has four main units. In April 2016, Units 1 and 2 began to solely utilize natural gas for generation. Units 3 and 4 are coal fired boilers. In recent years, the units are operated as peaking units. Total generation of the four units is approximately 829 MWe. In addition, two small combustion turbine generators (CTGs) are maintained on site as peaking units and also operated very infrequently. These two CTGs have no cooling or wastewater discharges associated with them.

Meramec Energy Center is scheduled to be retired on December 31st, 2022. As part of the transition, all site facilities including the surrounding ash ponds must be closed. Ameren is still determining the timing of demolition as well as the fate of certain facility infrastructures at the site.

The existing Meramec Energy Center NPDES permit contains nine designated outfalls. Once plant operations cease on December 31st, 2022 there will be seven operational outfalls and each is described below.

Outfalls 001 and 002 – Non contact Cooling Water

This is the discharge from two once-through cooling water systems. Water is withdrawn from the Mississippi River, passed through condensers and other heat exchangers and returned to the river. Cooling water for Units 1 and 2 is discharged through Outfall 001 and cooling water for Units 3 and 4 is discharged via Outfall 002. These outfalls are considered non-process waste streams.

**Once plant operations cease on December 31st, 2022, Outfall 001 and Outfall 002 will no longer be functional. Ameren requests to remove these two Outfalls from the newly issued NPDES permit.*

Outfall 003 – Ash retention pond

This is the discharge from the plant's current wastewater treatment pond. The Meramec Energy Center has a series of interconnected ponds that provide for flexible management of bottom ash, fly ash, low volume wastes and storm water runoff. The ash retention pond receives the discharge from these interconnected ponds for final

treatment prior to discharge via Outfall 003. Carbon dioxide is utilized to control effluent pH as necessary. Outfall 003 is considered a process waste stream.

Once plant operations cease on December 31st, 2022, Outfall 003 will be kept in operation until the final ash basins are closed. Once all closure activities are complete Outfall 003 will remain in service as a stormwater only outfall which will include intermittent flow depending on storm events. Outfall 003 will include approximately 15 acres of site stormwater runoff as you can see on Drawing III.

Outfall 005 – Combined Drain Sump and Emergency Overflow

This Outfall is an emergency discharge point for the Combined Drain Sump (CDS). During normal operations, the CDS collects various low volume waste streams from the plant for treatment in the ash ponds and discharge via Outfall 003. During emergency conditions, a locked manually operated valve would be opened to allow non-routine discharge from the CDS to the Mississippi River via Outfall 005.

**Once plant operations cease on December 31st, 2022, Outfall 005 will be directed to Outfall 010 for treatment and discharge.*

Outfall 006 – Caisson Sump and Screen Wash Discharge

Wastewater and river water at the intake is returned to the Mississippi River via this outfall. The discharge includes both the caisson sumps and traveling intake screen wash water. However, Meramec has been routinely sampling process water only from the oil water separator tanks prior to combining with screen wash discharge.

Upon ceasing plant operations on December 31st, 2022 Ameren requests Outfall 006 continue operations, as is, under the newly issued NPDES permit. Ameren expects the caisson sumps to continue functioning at various intervals in order to pump excess river water and/or storm water only from the caisson. At that time Outfall 006 will be a non-process water outfall.

Outfall 007 - Storm Water Runoff

This Outfall is one of the plants five outfalls that primarily discharges stormwater runoff. The outfall consists of approximately 25 acres which discharges directly into the Mississippi River. The drainage area of this outfall consists of the paved employee parking lot and the vegetated areas north and east of the employee parking lot. No process wastewater sources are included in this outfall. Note that run-on of stormwater from non-industrial areas of the plant and adjacent property owners contribute to a significant portion of the discharge from Outfall 007.

Although no structural controls are in place to reduce pollutants in the storm water runoff routed to this outfall, the Meramec Energy Center is committed to utilizing Best Management Practices (BMPs) to ensure ongoing protection of effluent quality. In

addition we believe there are no significant industrial pollutants in the discharged storm water from this area. BMPs include periodic documented inspections of the plant drainage area contributory to Outfall 007 to assure no significant materials or activities exist that could result in potential contamination of the discharged storm water. Please note that "Attachment E – Activities, etc…" provides additional details regarding BMPs utilized at the Meramec Energy Center. We respectfully request a continuation of the existing Outfall 007 monitoring requirements.

Outfall 008 – Storm Water Runoff

This discharge is one of the plants five outfalls that primarily discharge storm water runoff (SWR). The outfall currently covers approximately 24 acres and discharges into an unnamed tributary of the Meramec River. The drainage area of this outfall consists of a portion of the plant access road and adjacent vegetated areas.

No process wastewater sources are included in this storm water outfall. Note that run-on of storm water from adjacent property owners contribute a significant portion of the discharge from Outfall 008. This outfall has a small continuous dry weather flow as analyzed and described in past NPDES reapplications.

Upon closure of the Energy Center and corresponding ash ponds, Outfall 008 drainage area will increase in size to approximately 86 acres. The new drainage area will include a portion of the plant access road and adjacent vegetated areas as well as the entire capped and closed bottom ash pond area. The drainage area will also include the switchyard and an adjacent laydown area during closure activities. The discharge location will remain the same – an unnamed tributary of the Meramec River.

Although no structural controls are in place to reduce pollutants in the storm water runoff routed to this outfall, the Meramec Energy Center is committed to utilizing Best Management Practices (BMPs) to ensure ongoing protection of effluent quality. BMPs include periodic documented inspections of the plant drainage area contributory to Outfall 008 to assure no significant materials or activities exist that could result in potential contamination of the discharged storm water. We respectfully request a continuation of the existing Outfall 008 monitoring requirements.

Outfall 009 – Storm Water Runoff

This discharge is one of the plants five outfalls that discharge storm water runoff (SWR) only. The outfall consists of approximately 42 acres which discharges into an unnamed tributary of the Meramec River. The drainage area of this outfall consists of the capped and covered Pond 489, former Pond 495 which is also capped and closed as well as a portion of former Pond 494 which is also capped and closed. See Drawing III for an outline of the discharge area.

Upon ceasing plant operations on December 31st, 2022 Ameren requests Outfall 009 be retained in the renewed permit as a stormwater only Outfall.

Outfall 010 – New Outfall request

Outfall 010 is a new outfall added to the site for collection, treatment and discharge of wastewater and stormwater after the Meramec Energy Center ceases operations. This Outfall is the discharge that will encompass approximately 71 acres of the site. The treatment system post closure will collect site waste water via sources such as the CDS, clean water sumps and numerous stormwater sources. See Attachment F for a detailed explanation of the Outfall.

Chemical addition may be required to meet NPDES discharge limits for TSS and/or pH. A chemical coagulant may be added to balance particle charges and expedite settling. A polymer may also be added to aid in the aggregation of particles into larger floc for more efficient settling. If chemical addition is required, it is expected to be on a very temporary basis.

Outfall 011 – Internal Storm Water Runoff

Outfall 011 is an internal stormwater outfall added upon closure of Pond 494. The former ash pond is now capped and closed as seen in the aerial on Drawing III. The Outfall encompasses approximately 8 acres and all the stormwater discharge from the vegetated area is treated in a depression between the West berm of the closed ash pond, and the construction haul road. This low-lying area acts an infiltration basin with stormwater never leaving site. The bottom of the infiltration basin is an in-situ, well drained soil mixture which allows the natural permeability to drain at a slower rate.

Outfall 012 – Internal Storm Water Runoff

Outfall 012 is also an internal stormwater outfall added upon closure of Pond 494. The former ash pond is now capped and closed as seen in the aerial on Drawing III. The Outfall encompasses approximately 14 acres of the Northwest portion of the pond. All the stormwater discharge from the vegetated area is treated in a depression between the West berm of the closed ash pond, and the construction haul road. This low-lying area acts an infiltration basin with stormwater never leaving site.

Attachment B
2022 Reapplication sampling and analysis

Analysis and Flow Data

This section describes the source of data listed in Forms C & D

- Data from the special sampling project described below is listed in the 'Maximum Daily Value' column. Where applicable, the flows monitored during the sampling period are shown here and used to calculate mass discharges under this heading.
- Values listed under the headings 'Maximum 30 Day Value' and 'Long Term Average Values' were compiled from data required by the existing NPDES permit. Mass discharges under these headings were calculated using the appropriate long-term average flow rates.

Sampling and Analysis for this Reapplication

A series of water samples were collected by Ameren Missouri personnel as follows:

Analysis of Outfall 003 samples consisted of four individual grabs (for non-compositing parameters: E. Coli, pH, oil & grease and temperature) and modified (four aliquot) composites.

Composite samples collected for Outfall 003 and the Intake consisted of 24 hour flow proportional composites.

Samples were collected from Outfalls 003, 007, 008 and 009 using automatic sampling equipment triggered by flow in the outfall. The equipment was set to take one sample during each of the first three hours of runoff following the rainfall event. Analyses were run of the first hour grab sample, providing the 'first flush' data, and a composite sample including flow weighted aliquots from samples taken during the first, second and third hours, when available (with the exception of pH and O&G analyses, which were not composited).

Following on-site analysis of pH, samples were preserved and subsequently analyzed in accordance with 40CFR Part 136 and 10CSR 20-7.015(9). Samples were analyzed by Ameren Missouri's Laboratory Services Department and a contract laboratory PDC Laboratories Inc located in Florissant Mo. PDC Laboratories conducted lab analysis for volatiles, semi volatiles, and alpha and beta radioanalysis.

For outfalls 003, 007, 008 and 009 all of the data shown under the 'Maximum Daily Value' columns in Form C are from these sampling events for each outfall. Please note that on Form C no winter temperature reading was obtained. Stormwater temperature readings are not required by our current NPDES permit and sampling for this NPDES reapplication occurred in March and April which was listed under the summer temperature column.

Attachment C
Chemical Usage

Commercial chemical products used at Meramec Energy Center can be placed in three separate categories of usage, as they relate to wastewater discharge. While wastewater discharge will cease on December 31, 2022 the chemicals listed below may still be used for various projects during decommission.

Bulk Usage

This is a group of chemicals that are potentially used in Outfall 010 for chemical treatment at some rate or interval. Table 1 lists these additives with pertinent data including approximate quantity stored on site and annual rate of use of the pure chemical, and the outfalls from which each is discharged.

Ameren requests the permission to use these chemicals at irregular intervals, if needed, to treat water discharged from Outfall 003 and/or Outfall 010.

Laboratory Reagents

This group consists of chemicals stored and used in the plant laboratory. The predominant characteristic of this group is their low relative usage, resulting in negligible concentrations in the discharge effluent.

Other Chemical Products

This grouping includes other chemical compounds that may be discharged and are not included in the above chemicals.

Various solvents are used for equipment maintenance and/or lubrication. These waste solvents are disposed of in accordance with waste management rules and regulations. Some of these solvents contain the following volatile compounds (as listed in Form D):

Chemical	CAS Number
Toluene	108-88-3
1,1,1 – Trichloroethane	71-55-6
Trichloroethylene	79-01-6
Mineral Spirits	64742-88-7

Other chemical products which may be discharged include miscellaneous maintenance and household cleaning products. Ameren will provide an inventory of these products at the Departments request.

Table 1
Bulk Chemical Usage

1.	**Carbon Dioxide** Quantity on Site: 0 pounds Used of neutralization of Outfall 003 and/or 010 effluent Expected usage: 0 pounds/year Discharged to Outfall 003 and/or Outfall 010
2.	**Polymer (Robin – Floc 120 or equivalent)** Quantity on site: 0 pounds Used as a settling agent in water treatment Expected usage: 0 pounds/year Discharged to Outfall 003 and/or Outfall 010
3.	**Sodium Hydroxide solution (50%)** Quantity on site: 0 gallons Used for pH control Expected usage: 0 pounds/year Discharge to Outfall 003 and/or Outfall 010
4.	**Sulfuric Acid (93%)** Quantity on site: 0 gallons Used for pH control Expected usage: 0 pounds/year Discharge to Outfall 003 and/or Outfall 010
5.	**Copolymer (Bulab 5393)** Quantity on site: 0 gallons Used as a settling agent in water treatment Expected usage: 0 pounds/year Discharged to Outfall 010

Attachment D
Environmental Projects

Ash Pond Closures

At this time, the Bottom Ash Pond is in the beginning phases of being capped and closed. Ameren plans to complete that project by October 2023.

Meramec Energy Center Facility Closure

Ameren Missouri is planning to retire the Meramec Energy Center on December 31st, 2022 as documented in Ameren's Integrated Resource Plan. Ameren has already taken measures to significantly reduce the use of ash transport water, reduce thermal discharges and closed nearly all ash ponds at this facility. It is our intent that Meramec Energy Center continues to operate until its planned closure at the end of 2022.

Attachment E
Activities, Materials and Management Practices with the Potential to Impact Storm Water Quality

Significant Materials

Eleven (11) significant materials have been identified at Meramec Energy Center as being in contact with storm water currently. Each significant material is numbered and described below.

Upon operations ceasing at the site – some of the below materials may be used during decommissioning whereas some of the materials will be emptied appropriately of all contents and hauled offsite.

1. Coal pile – Remnants of the coal storage pile can be found on site southwest of the plant. Storm water runoff from this location will be routed to Outfall 010.

2. Dust suppression storage tanks – There are currently 8 above ground tanks near the coal handling and receiving areas that previously held dust suppression products. Each tank is located within a concrete retention berm in case of a spill. The tanks will be decommissioned after plant operations cease.

3. A covered metal dumpster is used as a temporary collection point for asbestos. When asbestos is removed from plant equipment it is properly managed and disposed of in compliance with 40 CFR Part 61.

4. Numerous oil filled transformers are located on site. The oil is used for cooling and insulation and are generally grouped by size. Upon ceasing operations at the Energy Center all the oil filled equipment will be drained of oil during the decommissioning process.

   A total of fourteen stalls along the north side of the plant. Thirteen contain large power transformers. One additional stall contains five oil storage tanks. Two of the tanks store transformer oil, two store clean oil circuit breaker (OCB) oil, and one stores used OCB oil. The transformers contain a total of approximately 81,000 gallons of oil. The five storage tanks have a maximum capacity of 32,000 gallons. A rock filled pit is present below each stall which is designed to contain any oil lost. These pits are tied together and discharge through a common line to a dedicated containment pond.

A second group of electrical equipment is located within the plant substation. It contains 19 OCBs and 12 instrument potential transformers. In the substation the ground is covered with a 7-inch layer of chat. An oil spill could be expected to be contained within the substation area as there are no drains.

The last group of electrical equipment consists of numerous transformers associated with the electrostatic precipitators located on the south side of the plant.

5. The combustion gas turbine generators have a storage tank containing diesel fuel oil. The nominal capacity is 1,500,000 gallons although normally a maximum of 500,000 gallons is stored in the tank. The tank is located within an earthen dike that is capable of containing the contents of the tank.

   Diesel fuel oil is also stored in two above ground 6,000 gallon tanks for mobile equipment. Both tanks are connected via a common drain tie line.

   Diesel fuel oil is also stored in an above ground tank adjacent to the diesel driven fire pump. Several above ground storage tanks are located near the merchant coal storage area and used for mobile equipment.

6. Used oil is stored in 55-gallon drums located adjacent to the mobile equipment shed.

7. Unleaded gasoline is stored in a 1,000 gallon above ground tank, located southeast of the plant office building.

8. Miscellaneous piping and plant equipment is stored in a paved yard area located east of the plant office building.

9. Empty 55-gallon drums, previously containing lubricating oil, anti-freeze, solvent and other materials are stored on site and periodically removed.

10. 55-gallon drums containing waste solvents are stored at the plants designated hazardous waste main storage area. A maximum of five drums are stored in this location.

11. Two open top trash dumpsters and two compactor dumpsters are located at the site.

Hazardous Wastes

The Meramec Energy Center is classified as a small quantity hazardous waste generator. Several satellite accumulation areas are located on site which can receive hazardous waste for up to one year. At that time, the waste must be moved to the main storage area where it is shipped off site within 180 days in accordance with federal regulations.

Outdoor Vehicle Maintenance and Cleaning Areas

General cleaning of mobile coal handling equipment, normally using a high-pressure wash without detergents is performed at the mobile equipment shed which flows to Outfall 010.

Pesticides and Herbicides

Liquid herbicides are applied by a licensed contractor. The initial treatment each year is for pre-emergence control of vegetation in the spring. Additional applications usually once during the late summer or early fall are applied to actively growing vegetation. Pesticides are applied per instructions on the product label.

Management Practices

The Meramec Energy Center relies on numerous routine management practices to help prevent contamination of storm water runoff and ensure appropriately and timely responses to spills and other unanticipated events.

The plant has a SPCC Planning Guide that describes various management practices to minimize oil spills/releases and their contact with stormwater runoff. The SPCC Guide also designates a plant spill coordinator who is available to provide technical assistance and advice related to spill prevention, clean-up, waste management and reporting.

Preventive maintenance activities also include routine inspections of above ground storage tanks, valves, pipelines, and associated equipment. Plant staff conduct the inspections on a regular basis.

The following measures in conjunction with other existing practices are utilized to control the quality of effluent from the plants five storm water point sources (Outfall 007, Outfall 008, Outfall 009, Outfall 011 and Outfall 012):

- Periodic inspections of the drainage areas of the plants storm water point sources, to initiate maintenance as may be necessary to prevent contamination

- Maintenance, regrading and/or revegetation of plant access roads, drainage swales, and perimeter yards to avoid excessive erosion and/or creation of new stormwater discharges
- Procedural controls to prevent materials, equipment storge, and/or laydown within stormwater point source drainage areas
- Case by case evaluation of non-routine projects within stormwater drainage areas to prevent unauthorized discharges; assess the potential for contamination of runoff, and to implement appropriate protective measures.

Ameren believes these management practices collectively provide an acceptable and effective alternative to numeric effluent limitations and thus we request that the Department continue to retain the non-numeric monitoring requirements for Outfalls 007, 008 and Outfall 009 as provided in the existing NPDES permit.

Attachment F
New Outfall – Outfall 010

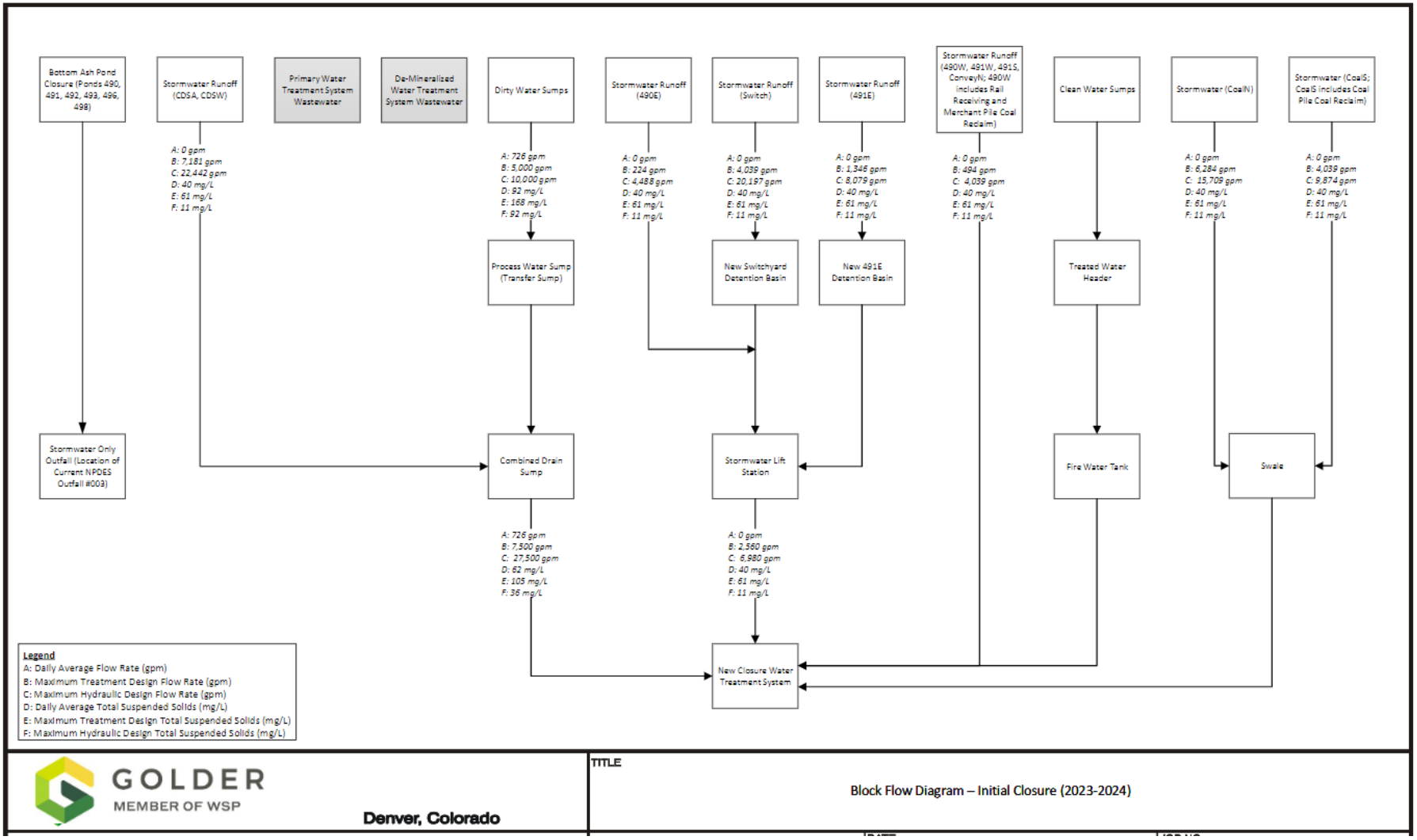
As described in Attachment A, Ameren is requesting to add a new Outfall to the reissued NPDES permit. Outfall 010 will be the discharge of the new Closure Water Treatment System (CWTS) once Meramec Energy Center ceases operations. Any process water used during closure and post closure activities as well as some site stormwater will be routed and treated through this outfall. The physical discharge location of the outfall is to the Meramec river at the direct confluence of the Mississippi river, just downstream from the current Outfall 003. See Drawing I for an aerial picture and Drawing IV for a natural flow path of Outfall 010 discharge to the Meramec river.

The CWTS contains a detention basin type operating system that is designed to settle out suspended solids by gravity present in stormwater and process water. Treated water is then discharged to the Meramec river via Outfall 010. The treatment basin has a total area of 3.7 acres with a depth of 16 feet and is sized to accommodate the maximum treatment design flow rate and maximum treatment design during the initial closure period, Drawing I. The total volume of the closure water treatment basin can accommodate 110% of a 25 year 24 hour storm event. The detention basin includes an emergency overflow on the northeast corner of the basin and will overflow into the low points around the basin within the Ameren rail loop.

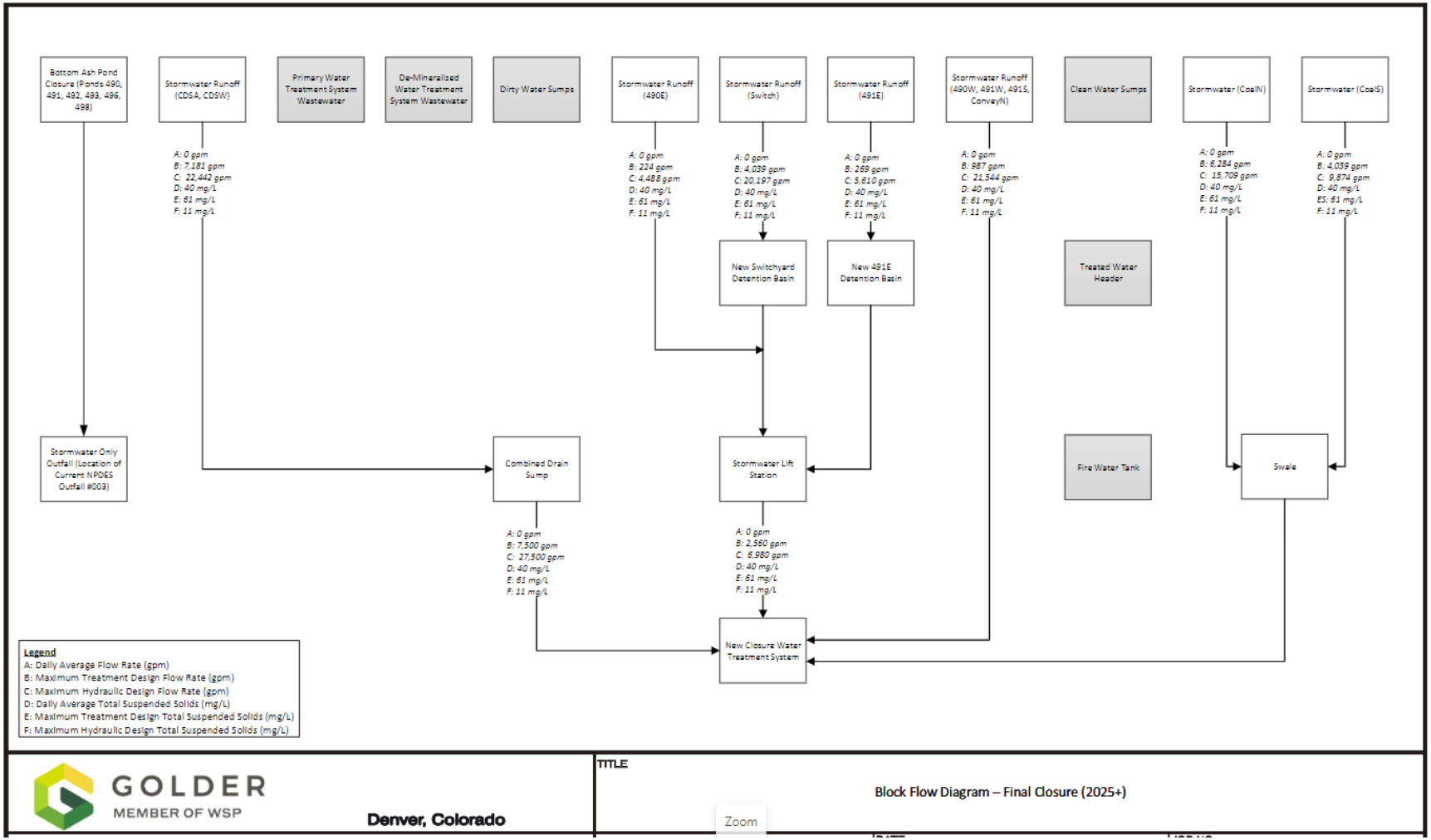
The CWTS is designed to treat water from three separate sources. During 2023 and 2024 the combined drain sump (CDS), the stormwater lift station (SLS), and other stormwater sources will be routed to the CWTS. The CDS mainly consists of flows from eight separate water sumps located inside the power building, wastewater from the primary treatment system and wastewater from the demineralized water treatment system. During this time frame flows to the CWTS will average approximately 1 million gallons per day with maximum flows at 10.8 MGD. The SLS is comprised of stormwater runoff from the switchyard area, stormwater from the CTG area as well as stormwater runoff west of the main power block. Additional stormwater sources routed to the CWTS include areas around the coal pile and the rail receiving area.

After the demolition is completed, the CWTS will only process stormwater as seen on Drawing II. As you can see from the drawing stormwater will be included from various locations with flows solely dependent on storm events.

Drawing I - *Outfall 010 flow diagram after plant closure. Expected years 2023-2024*



Drawing II - Outfall 010 flow diagram after plant closure. Expected years 2025+



Drawing III

0 250 500
SCALE FEET

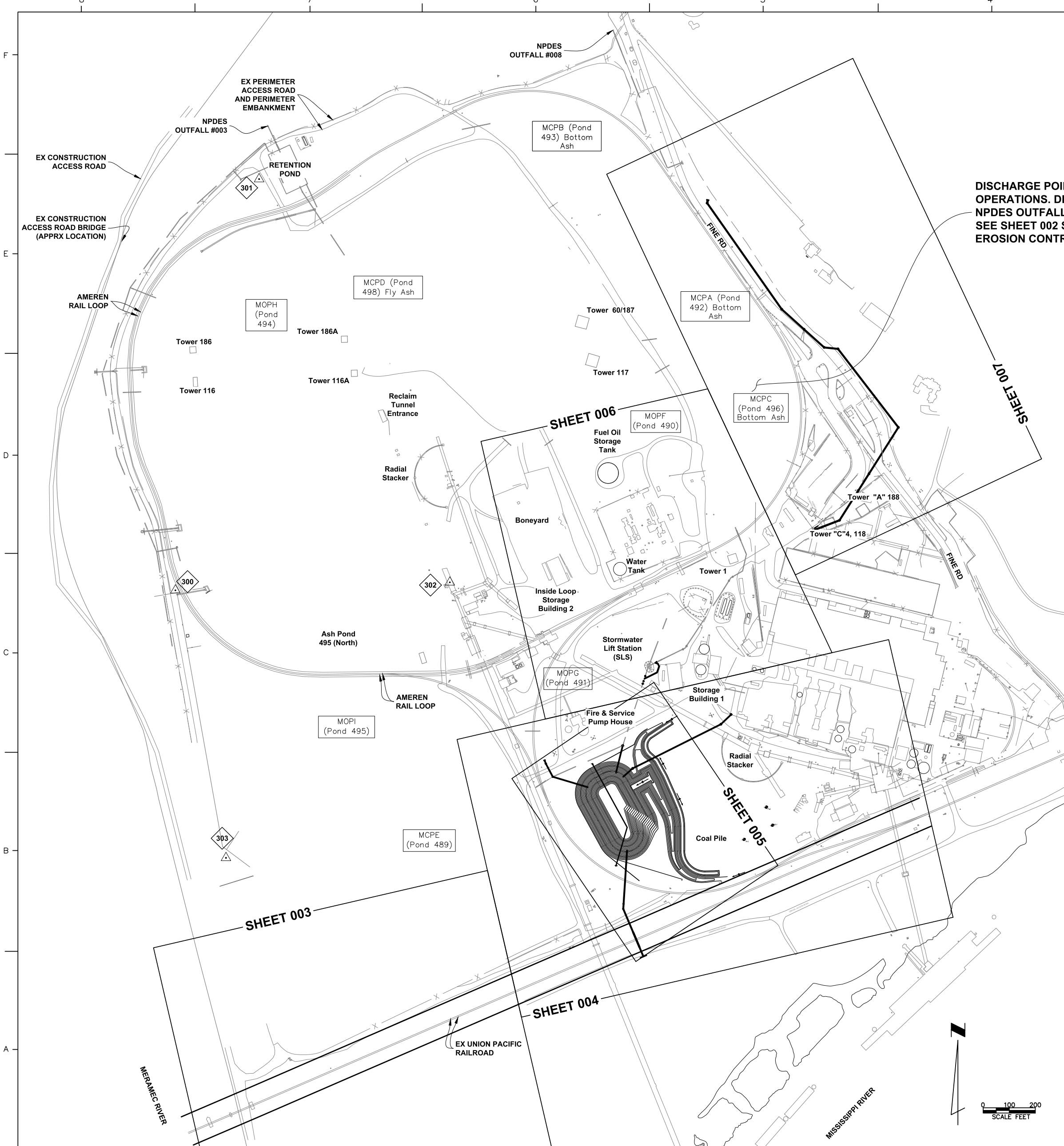
N

SHEET 1 OF 1	MERAMEC ENERGY CENTER WATERSHED MAP BEFORE BOTTOM ASH POND CLOSURE	Ameren Missouri 3700 S. Lindbergh St. Louis, MO 63127	Designed E.J.K. Checked J.L.F. Drawn A.E. Issued 6/29/2022	REITZ & JENS, INC. CONSULTING ENGINEERS 1055 CORPORATE SQUARE DRIVE ST. LOUIS MISSOURI 63132 (314) 993-4132 PROFESSIONAL ENGINEERING CORP., LICENSE #000215


Drawing IV - Outfall 010 flowpath
Legend
Existing Natural Swale to Meramec River
New Pipe
New NPDES Outfall (Stormwater Only)
Fine Rd
ILLINOIS
Meramec River
Dickerman Ct
Google Earth
N
1000 ft


Outfall 008
Outfall 003
Outfall 012
Outfall 011
Outfall 009
Outfall 010
Outfall 006
Outfall 007
Hillcrest Country Club
Frisbee Shelter Parking
Meramec Power Plant
Meramec River
Mississippi River
Missouri
Hillcrest Rd
Pine Rd
Pine Rd

Meramec Energy Center
Closure Water Treatment System



LEGEND

- EXISTING FENCE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING SANITARY SEWER
- EXISTING STORM PIPE
- EXISTING STORM INLET
- EXISTING INLET DESIGNATOR
- EXISTING UTILITY GAS
- EXISTING UTILITY OVERHEAD ELECTRIC
- EXISTING UTILITY TRANSMISSION TOWER
- EXISTING UTILITY WATER
- TEST HOLE (P- #)
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- PROPOSED STORM MANHOLE
- PROPOSED STORM GRATED INLET
- PROPOSED MANHOLE DESIGNATOR
- PROPOSED INLET DESIGNATOR
- CONTROL POINT
- CONTROL POINT DESIGNATOR
- DETAIL CALLOUT, WHERE A= DETAIL # AND B = SHEET #

KEY TO ABBREVIATIONS

APPRX - APPROXIMATE
BLDG --- Building
CDS ----- Combined Drain Sump
CL ------- CenterLine
CMP ---- Corrugated Metal Pipe
CONC -- Concrete
CO ------ Cleanout
CPP ---- Corrugated High Density Polyethylene Pipe
CWTS ---Closure Water Treatment System
ELEV --- Elevation
EX ------- Existing
FL ------- FlowLine
FT ------- Foot
FTG ---- Footing
GI ------- Grate Inlet
GPRR -- Ground Penetrating Radar
HDPE -- High Density Polyethylene
IN ------- Inch
L -------- Length of Curve
LF ------ Lineal foot
MAX --- Maximum
MH ----- ManHole
MIN ---- Minimum
NIC ---- Not In Contract
NWL--- Normal Water Level
PC ----- Point of Curvature
PI ------ Point of Intersection
PT ----- Point of Tangency
R ------- Radius
RCP --- Reinforced Concrete Pipe
RR ----- Railroad
SAN --- Sanitary
SLS ----Stormwater Lift System
STA --- Station
STM --- Storm
TBA --- To Be Abandoned
TBAF - To Be Abandoned and Filled
TBM -- Temporary Bench Mark
TBR --- To Be Removed
TBRR - To Be Removed and Replaced
TP-# --- Tie Point #
TYP ---- Typical
UIP ----- Use In Place
W/ ----- With

Index of Sheets

BENCHMARK AND SURVEY NOTES:

State Plane Coordinates, bearings, and elevations on this project were established utilizing the Missouri Highways and Transportation Commission Global Navigation Satellite Real Time Network for Continuous Operating Reference Stations between April 2019 and October 2021, and are based on the Missouri coordinate system of NAD1983, Zone East, US Survey Feet, Grid North and North American Vertical Datum 1988 (NAVD 1988)

Control Ponts:

300	N 935702.515	E 864716.208	Z 418.747	IRON ROD W/ CONTROL CAP
301	N 937281.040	E 865037.318	Z 414.086	IRON ROD W/ CONTROL CAP
302	N 935732.976	E 865769.088	Z 428.949	MAG NAIL
303	N 934675.370	E 864910.163	Z 420.241	IRON ROD W/ CONTROL CAP

FLOOD ZONE INFORMATION:

THE SITE IS IN ZONE AE AND ZONE X, AND IS SUBJECT TO INUNDATION FROM THE 1% ANNUAL CHANCE FLOOD AS INDICATED ON FLOOD INSURANCE RATE MAP (F.I.R.M.) PANEL NO. 29189C0440K, DATED FEBRUARY 4, 2015.

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

THE ENGINEER WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED ENGINEER RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

REITZ & JENS, INC.
CONSULTING ENGINEERS
1055 Corporate Square Drive
St. Louis, Missouri 63132
314.993.4132
Missouri Professional Engineering Corporation
License No. 000215

PARTIALLY SUPERSEDED ---------------------------------- REV---- DATE --/--/----

CONSTRUCTION

NOTICE OF LIMITED RESPONSIBILITY
THE RESPONSIBILITY OF THE UNDERSIGNED ENGINEER IS LIMITED TO THE DESIGN WORK SHOWN ON PROJECT AND DOCUMENTS BEARING HIS/HER SEAL, SIGNATURE OR INITIALS. HE/SHE DOES NOT HAVE AUTHORITY OVER THE PROJECT AS A WHOLE. THE UNDERSIGNED DISCLAIMS ANY RESPONSIBILITY FOR WORK DONE UNDER SUBSEQUENT REVISIONS AND ANY OTHER DOCUMENTS ASSOCIATED WITH THE PROJECT WHICH DO NOT BEAR HIS/HER SEAL, SIGNATURE OR INITIALS.

MARK UP DRAWING NO.	REV.

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

SUPERSEDES ---------------------------- REV---- DATE --/--/----

CLOSURE WATER TREATMENT SYSTEM COVER

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
0	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PROP-000011-001

REVISION NO. 1

GENERAL NOTES:

1. Intent of Specifications and Drawings - The Contract Documents shall be interpreted as being complementary, requiring a complete Project. Any requirement occurring in any one of the Contract Documents is as binding as though occurring in all Contract Documents. Generally, Specifications address quality, types of materials and Contract conditions, while Plans show placement, sizes, and fabrication details of materials. In the case of discrepancy between plans and specifications, the issue shall be immediately brought to the attention of the Owner for resolution.
2. The location and depth of existing underground facilities, structures and utilities, if shown on these plans, shall be considered approximate. There may be others, the existence of which are unknown. The contractor shall be solely responsible to notify all utility companies and field locate and verify all existing underground facilities, structures and utilities, either shown or not shown on these plans, prior to the beginning of excavation or construction. Any discrepancy between the size, quantity, depth or location of underground improvements shown on these plans and those located in the field shall be immediately brought to the attention of the Engineer and Owner. The general contractor must be on file with the Missouri One Call System 1-800-344-7483.
3. All construction methods and operations shall be completed in such a manner as to protect all adjacent existing buildings, railroads, and site improvements. The contractor will be held solely responsible and shall take all precautions necessary to avoid damage to adjacent properties during all phases of construction. Any damage to adjacent existing buildings and/or site improvements, including private utilities, shall be repaired at the contractor's sole expense.
4. All elevations are based on Missouri State Plane and NAVD 88 datums and are shown to finished elevation. The site benchmarks are shown on the plans. All finished grades in soil areas shall be within 0.2 feet of that shown, unless approved otherwise by Owner.
5. Conditions shown on the drawings represent conditions surveyed between April 2019 and October 2021. Existing elevations and grades may have changed since the original survey was completed due to erosion, sediment accumulation, and/or continued deposition of CCR material. Contours inside of the rail loop within coal pile change frequently.
6. Field verify all dimensions before construction. Do not scale drawings, follow dimensions. All control points and construction stake-out shall be provided by the Contractor.
7. All trenching and excavation shall be sloped or braced in strict compliance with all Federal, State and Local laws, rules and regulations. Compliance with these laws, rules and regulations is the sole responsibility of the Contractor.
8. The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.
9. The Contractor shall coordinate with Ameren staff to complete the following items of work during the project.
   - 9.1. Coordination will include allowing Ameren staff and/or other contractors to interrupt progress and access the site to begin and complete their work.
   - 9.2. Dispose on site any material excavated for the project that is not re-used in place.
   - 9.3. Sanitary Lift Station effluent pipe to be re-routed (see Alignment C)
   - 9.4. Combined Drain Sump effluent line to be re-routed (see Alignment D). It is assumed contractor will install the majority of the new pipe on Alignment D, then coordinate with Ameren to bypass pump the Combined Drain Sump flow to the bottom ash pond while the existing Combined Drain Sump effluent pipe is connected to the new re-routed pipe.
   - 9.5. Water line along Fine Road to be relocated by contractor (see Alignment G).
   - 9.6. Sanitary Sewer force main along Fine Road to be relocated by contractor (see Alignment G).
   - 9.7. Disruptions to the power to, and the automated operation of, the Contractor Security Gate during installation of the Alignment G drain pipe.
   - 9.8. Trenching new Alignment G drain pipe under transmission tower.
10. The SLS and the CDS pumping systems must remain in service throughout construction. Contractor is responsible for bypass providing and operating bypass pumping as needed to complete re-routing of these systems.
11. Contractor shall provide and maintain off-site traffic control in accordance with the latest edition of the Manual of Uniform Traffic Control Devices and St. Louis County requirements, and shall manage off-site traffic as directed by St. Louis County, applicable local jurisdictions and Ameren. The Contractor shall notify the proper authorities at least two working days in advance of starting work on a traveled street.
12. The contractor shall develop two off-site haul routes for delivering materials and equipment to the Meramec plant. The first (base) haul route must use the access route provided in these Project Plans (sheet 002). The second (alternate) haul route includes Fine Road, can only be used with the permission of Ameren when the base route is unavailable due to Meramec River flooding. For both routes, all construction traffic will enter the site through approved construction entrances into the facility and access routes through the facility, which shall be coordinated with Ameren. Contractor is responsible for the cost and alignment of any associated temporary fencing required to provide secure entrances through portions of perimeter fence without existing gates.
13. Existing railroad tracks and gravel access roads shall remain open during construction.
14. Railroad - Contractor is responsible for, and Contractor's lump sum bid cost shall include, obtaining Union Pacific Right of Entry Permit and all insurance necessary for completing the work, and flagmen.
15. The contractor shall maintain one clean set of marked plans showing all changes and "as built" information.

SEDIMENT AND EROSION CONTROL NOTES:

1. The Contractor shall assume complete responsibility for controlling all siltation and erosion of the project area. Control shall commence with the clearing operations and be maintained throughout the project until acceptance of the work by Ameren. The Contractor's responsibilities include all design and implementation as required to prevent erosion and the depositing of eroded materials. Ameren may at their option direct the Contractor's methods as deemed fit to protect property and improvements. Any depositing of materials on new or existing pavement shall be removed immediately. Any depositing of materials in new or existing storm sewers and/or swales shall be removed after each rain and affected areas cleaned to the satisfaction of Ameren.
2. All erosion control systems are to be inspected and corrected weekly, especially within 48 hours of any rain storm resulting in one-half inch of rain or more. Any materials leaving the site and affecting storm water drainage facilities shall be cleaned up within 24 hours after the end of the storm.
3. Erosion control devices (silt fence, sediment basin, etc.) shall be installed and maintained, and site operations shall be conducted in accordance with the St. Louis County Department of Highways and Traffic "Sediment and Erosion Control Manual," the Missouri Department of Transportation (MoDOT) Standard Specifications for Highway Construction, the MoDOT Engineering Policy Guide Chapter 806.8, and the MoDOT Stormwater Pollution Prevention Plan, Standard Plan 806.10.
4. Stormwater Runoff and Subsurface Water
   - 4.1. All stormwater runoff within the Ameren Rail Loop and Switchyard is currently directed to the retention pond where it is discharged through the perimeter embankment at NPDES Outfall #003 (see sheet 001). All subsurface water and/or stormwater runoff that occurs during or is created by construction shall be controlled and collected by the Contractor by pump and discharged in a stable manner at the "Stormwater Discharge Point" (south end of Ash Pond 496 as shown on sheet 001), until tll disturbed areas have been stabilized against long-term erosion. This will require pumping stormwater runoff from within the limits of work. All standing water shall be pumped from the work area within 72 hours of a rain event.
   - 4.2. All stormwater runoff east of Fine Road is currently directed to a 24-inch pipe under Fine Road where it discharges into a tributary to the Meramec River at NPDES Outfall #008.
   - 4.3. All stormwater runoff south and west of the Coal Pile and Ameren Rail Loop is currently directed into a ditch along the Union Pacific Rail Road
   - 4.4. The contractor shall implement any and all measures necessary to assure that water discharges from the site meet the effluent standards for Outfall #003 and #008 in Permit # MO-000361, including a total suspended solids (TSS) concentration of 100 mg/l (daily maximum). Contractor shall coordinate with Ameren NPDES / environmental for timing and requirements before removing pumping operations or putting into service any pipes discharging outside of facility.
   - 4.5. Remove all free water before placing ill.
5. Contractor shall clear construction-related material from railroad loop tracks on a daily basis, or as directed by the Owner.

TESTING:

1. Contractor shall be responsible for:
   - 1.1. All field and laboratory tests and sampling by methods and frequencies required for the HDPE Liner material and installation and off-site borrow sources, and provide written and electronic copies of documentation to Owner's CQA representative as defined in the CQA Plan and the Construction Specifications.
   - 1.2. Providing a source for soil borrow material, which includes the cost of performing and submitting testing data to Ameren for approval. Once the borrow source and material is approved, Ameren's CQA engineer shall be responsible for testing of installed soil per Specifications Section 02200 item 1.4 Quality Assurance.
2. All other quality control/quality assurance testing required by the specifications and CQA plan that do not pertain to the items listed in the preceding shall be provided by Owner's CQA Engineer.

SCHEDULE:

The Contractor shall coordinate construction using the Schedule Milestones listed in the Specifications, excerpted as follows:

1. Mobilization	April 2022
2. Substantial Completion	October 15, 2022
3. Final Inspection and Project Close-out	November 30, 2022

GRADING:

1. Proposed contours shown are to final grade, except within the limits of the HDPE Liner where contours represent to of subgrade.
2. Final Cover shall be placed throughout the entire Limits of Double-Layer HDPE Liner shown on plan.
3. All excavated material shall remain on site and be placed within an area designated by Ameren. All imported material shall be clean, uncontaminated fill.
4. Ameren will remove stockpiled coal within the Limits of Work for the Closure Water Treatment Basin as shown in the Contract Documents.
5. The existing material within the security fence is predominantly Fly Ash, which requires OSHA Class C Trench Excavation.
6. Contractor shall provide grading as needed to provide positive drainage within the limits of work with no standing water.
7. Any granular fill not called out in the plans and specifications shall be MoDOT Type 5.

CWTS LINER:

1. HPDE Geomembrane Liner shall be 60 mil with white on one side, and shall be double-textured.
2. Geocomposite shall be double-sided with geotextile fabric.
3. Geotextile Fabric (Underdrain) shall be used for the geocomposite (fabric that faces the CCR subgrade) and to wrap the underdrain pipe bedding, and shall be non-woven polypropylene yarns meeting the following specifications. Solmax "Coal Drain, Coal Text" is one possible product that meets these specifications

Minimum Average Roll Values (MARV)

Mechanical Properties

Mass per unit area	ASTM D 5261	480 grams / m^2
Apparent Opening Size AOS (US Sieve)	ASTM D4751	170 (0.088 mm)
Permittivity	ASTM D 4491	0.3/SEC
Water Flow Rate	ASTM D 4491	814 lpm / m^2
Grab Strength	ASTM 5034	890 N
Puncture Strength	ASTM D 6241	3447 N
Tear Strength	ASTM D 4533	378 N

All values are minimum average roll values

4. Geotextile Cushion for use over HDPE Geomembrane Liner shall be needle-punched nonwoven polypropylene fibers meeting the following specifications. Mirafi S1200 is one possible product that meets these specifications:
   - 4.1. Mass / Unit Area (ASTM D5261) 12 oz/sq yd
   - 4.2. Grab Tensile Strength (ASTM D4632) 320 lbs
   - 4.3. CBR Puncture Strength (ASTM D6241) 900 lbs
   - 4.4. Apparent Opening Size (ASTM D4751) 100 sieve
   - 4.5. Permittivity (ASTM D4491) 0.9 / sec

   All values are minimum average roll values
5. HDPE placement and welds shall be per the details on these plans, and the manufacturer recommendations.

SEWER NOTES:

1. All sewer manholes and inlets shall be pre-cast reinforced concrete, except where cast-in place reinforced concrete is accepted by the engineer. Contractor shall provide design for HS20 loading and submit shop drawings for review and approval by the engineer.
2. Hydro-excavation minimum extents are shown on profiles, and shall be coordinated with Ameren.
3. Concrete
   - 3.1. Portland Cement shall conform to the requirements of Specifications for Portland Cement, ASTM C150. Type II cement shall be used unless otherwise specified.
   - 3.2. Air-Entraining Admixtures for Concrete shall conform to the requirements of the Specifications for Air-Entraining Admixtures for Concrete, ASTM C260.
   - 3.3. Aggregates for Concrete shall conform to the requirements of Specifications for Concrete Aggregates, ASTM C33, except as further specified herein. Natural sand shall consist of clean, hard, durable, uncoated grains. Mississippi and Missouri River sands or other sands containing lignite are not acceptable for exposed concrete. Gravel shall be washed, hard, strong, durable pieces free from thin, porous, elongated, or laminated particles. Crushed limestone for coarse aggregate shall consist of uncoated particles of sound, durable rock of uniform quality, without an excess of flat, elongated, or laminated pieces. No surface, yellow, or soft stone shall be permitted. The specific gravity of the stone shall be not less than 2.56.
   - 3.4. Water when used with cement in mortar or concrete or for curing of concrete or for testing of structures for water-tightness, the water shall be potable.
   - 3.5. Metal Reinforcement in Concrete
     - 3.5.1. Reinforcing bars shall conform to the requirements of the Specifications for Rail-Steel and Axle-Steel Bars for Concrete Reinforcement, ASTM A615, A616, or A996.
     - 3.5.2. Welded wire fabric or cold-drawn wire for concrete reinforcement shall conform to the requirements of the Specifications for Steel Wire, Plain for Concrete Reinforcement, ASTM A82, or the Specifications for Steel Welded Wire Reinforcement plain for Concrete, ASTM A185.
4. Precast reinforced concrete manholes shall conform to the standard specifications for precast reinforced concrete manhole sections, ASTM C478 and the approved Standard Details of Sewer Construction. The Portland cement used shall be Type II.
5. Manhole cones shall be concentric and base sections shall have the base riser section integral with the floor.
6. Manhole steps shall be cast into the full depth of the wall section or installed by an approved alternate method.
7. Connections for inlet and outlet pipes shall be of an approved patented compression type connection. Connections at all stormwater structures shall be made with A-lock joint or equal.
8. The minimum inside diameter for inside manholes is as specified on the pipe profiles.
9. The use of precast reinforced concrete grade rings for manhole adjustments is allowable provided the rings have minimum dimensions of 26.5" opening, 3" height, and 8" width. No more than one grade ring shall be used per adjustment unless the total height of adjustment is (6") or greater; then a maximum of two will be allowed as long as the total adjustment does not exceed a maximum dimension of 18" from top of cone to top of frame. No metal adjustment rings are allowed, for new construction.
10. Manholes shall be waterproofed on the external surface of the manholes after the full height is installed and pipe connections have been completed.
11. Inlet stones, sills, and blocks and other pre-cast units shall be made to the dimensions and with the reinforcement as shown in Metropolitan St. Louis Sewer District's (MSD's) Standard Details of Sewer Construction, and in accordance with these specifications. They shall be made of 5,000 psi air-entrained concrete, and cast in one operation. Immediately after casting, the concrete next to the forms shall be thoroughly spaded and the whole thoroughly compacted by tamping or vibrating in order to provide dense concrete with uniform surfaces free from honeycombing. All concrete inlet covers, for inlet stones, shall have a minimum of 3 lbs. of "Fibermesh" (synthetic fibers), per cubic yard, for reinforcement.
12. Sewer pipe shall be of the type specified in the Contract Documents which includes:
    - 12.1. Reinforced Concrete Pipe Class III.
    - 12.2. ADS SaniTite HP Triple Wall with a smooth interior and exterior surfaces with annular inner corrugations.
    - 12.3. ADS N-12 HDPE DR17 Dual Wall with a smooth interior and annular exterior corrugations, or approved equivalent.
    - 12.4. SDR 17 HDPE. Plans indicate where perforated versus solid-walled pipe shall be used.
13. All sewer non-welded pipe joints (full pipe circumference) inside of the Ameren rail loop, and Alignment A Structures 8 thru 10 shall be wrapped with geotextile filter (8 oz. / sq. yd.) with a minimum lap of 2 feet. Geotextile filter shall extend a minimum of 12 inches beyond each end of the coupling band with a minimum overlap of 12 inches. Fix each side of the geotextile filter to the pipe (full circumference) prior to backfill.
14. Sewer bedding, backfill, subgrade replacement, and shall be mechanically compacted crushed limestone and shall be sound, durable, and free from cracks and other structural defects that would cause it to deteriorate. It shall not contain any soapstone, shale, or other material easily disintegrated. Gradations of bedding are specified as follows:

    MSD #1 bedding shall meet the following gradation except as noted in the details.

Sieve Size	Percent Passing (by weight)	
	Maximum	Minimum
1 inch	100	100
3/4 inch	100	90
1/2 inch	60	35
No. 100	10	0

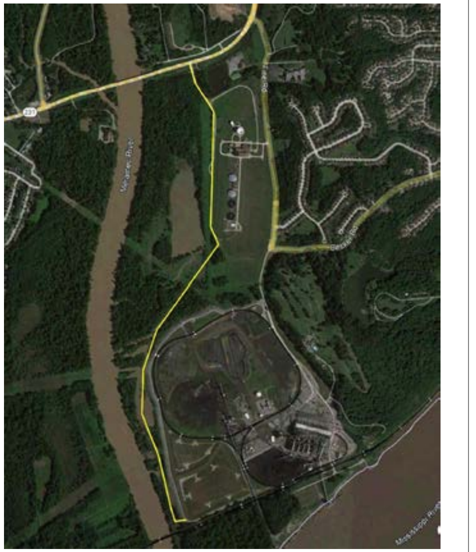
15. Geotextile Fabric (Unsuitable Subgrade) - Fabric shall meet the specifications of Geotextile Fabric (Underdrain) as defined under Final Cover.
16. The thickness of the loose backfill lift (prior to compaction) should not exceed 12 inches where large, self-propelled compaction equipment can be used. In confined areas, where manual compactors are required, the lift thickness should not exceed 6 inches prior to compaction. The backfill shall be compacted to a minimum dry unit weight equal to 95% of the maximum dry unit weight determined by the Standard Proctor (ASTM D-698). If the backfill material does not produce a Proctor Curve, compaction shall meet a Max/Min test to 75% relative density (ASTM D-4253 and D-4254).

ABANDONMENT:

1. The plans label segments of existing storm sewer pipes as "To Be Abandoned and Filled" (TBAF) including:
   - 1.1. Sheet 4 - 294 feet of 24-inch HDPE from Structure 21 to Structure 31 (may be removed)
   - 1.2. Sheet 4, Sheet 6 - 890 feet of 20" CDS HDPE from Structure 43 to the outfall at the Bottom Ash Pond.
   - 1.3. Sheet 6 - 675 feet of 24" SLS HDPE from near Structure 34 to the outfall at the Bottom Ash Pond.
   - 1.4. Sheet 7 - 8 feet of 12" CMP from Structure 58 to Strcture 143 (may be removed).
2. The Contractor may remove and replace with compacted backfill that portion of the sewer to be abandoned in lieu of filling and blocking for the segments listed above as "may be removed". The remaining pipe segment labeled as TBAF shall be grouted full.
3. Storm sewer pipes to be grouted full shall be securely blocked at any points of intake or discharge with a bulk-head or pre-formed plug and when directed by the Project Plans and Specifications, they shall be completely filled with an approved material. Grout shall be pumped into position in such a manner as to avoid air pockets and to fill the entire void. The proposed grout material and method of filling and blocking the sewer shall be submitted to the Owner for approval.

EROSION CONTROL BLANKET (ECB) NOTES:

1. Erosion Control Blanket (ECB) shall be placed over all disturbed areas at the completion of construction except within the limits of the coal pile and where rip-rap, gravel access roads, or railroad ballast are present. All areas receiving ECB shall be seeded in accordance with seeding specifications, and shall be seeded/fertilized/limed as necessary prior to installation of ECB.
2. ECB shall be installed per manufacturer specifications, which includes but is not limited to using specified anchorage materials and patterns, "shingle" upgrade sections over downgrade sections, and installing channel trench along sections at the top of a slope and as shown on these project plans.
3. The ECB shall be double-net ECB meeting Type 2D specifications established by the Erosion Control Technology Council. ECB shall be constructed of UV-degradable materials, shall have a minimum mass per unite of area of 0.50 lb/square yard ±0.1 lb/square yard, and shall have a functional longevity of approximately 18 months. The biodegradable material shall be evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom with 100% UV-degradable netting meeting the following specifications, or approved equal. ECB shall be American Excelsior Curlex II CL, Tensar North American Green Rollmax S150, or approved equal.
   - 3.1. Tensar North American Green Rollmax S150 - 100% UV-degradable netting shall be woven into an approximate 0.50 x 0.5 inch mesh, shall be sewn together with degradable thread on 1.50 inch centers, and shall contain 100% straw (certified noxious weed-free agricultural). Tensile Strength (MD) shall be 159.6 lbs/ft (ASTM D6818).
   - 3.2. American Excelsior Curlex II CL - 100% UV-degradable netting shall be woven into 1.0 inch x 2.0 inch mesh, and shall contain a specifc cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% of the fiber ≥ 6 inches in length. Tensile Strength (MD) shall be 127.0 lbs/ft (ASTM D6818).



Note:
Base haul route includes construction access off of MO-231 / South Telegraph Road via Williamson Road. The aerial photo used for this route was taken in 2017 during high water, showing that the route is subject to occasional flooding.

(1 / -) **CONSTRUCTION ACCESS ROUTE**
NO SCALE

STATE OF MISSOURI · ERIC KARCH · NUMBER PE-2007005040 · PROFESSIONAL ENGINEER

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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SCALE	1" = 50'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM NOTES

DRAWING RECORD

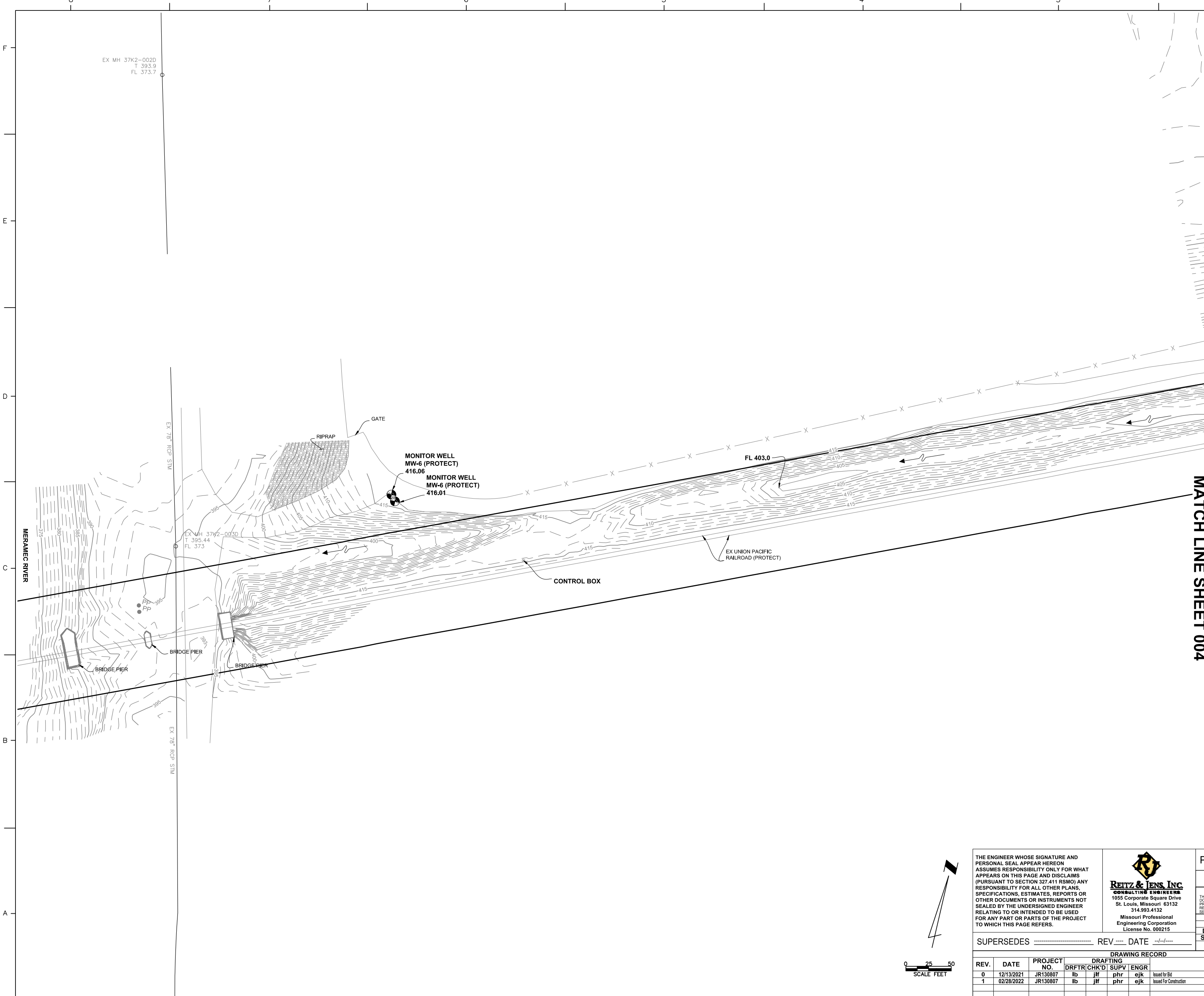
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Consrtuction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PROP-000011-002

REVISION NO. 1



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SCALE	1" = 50'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PLAN - CWTS DITCH/PIPE

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

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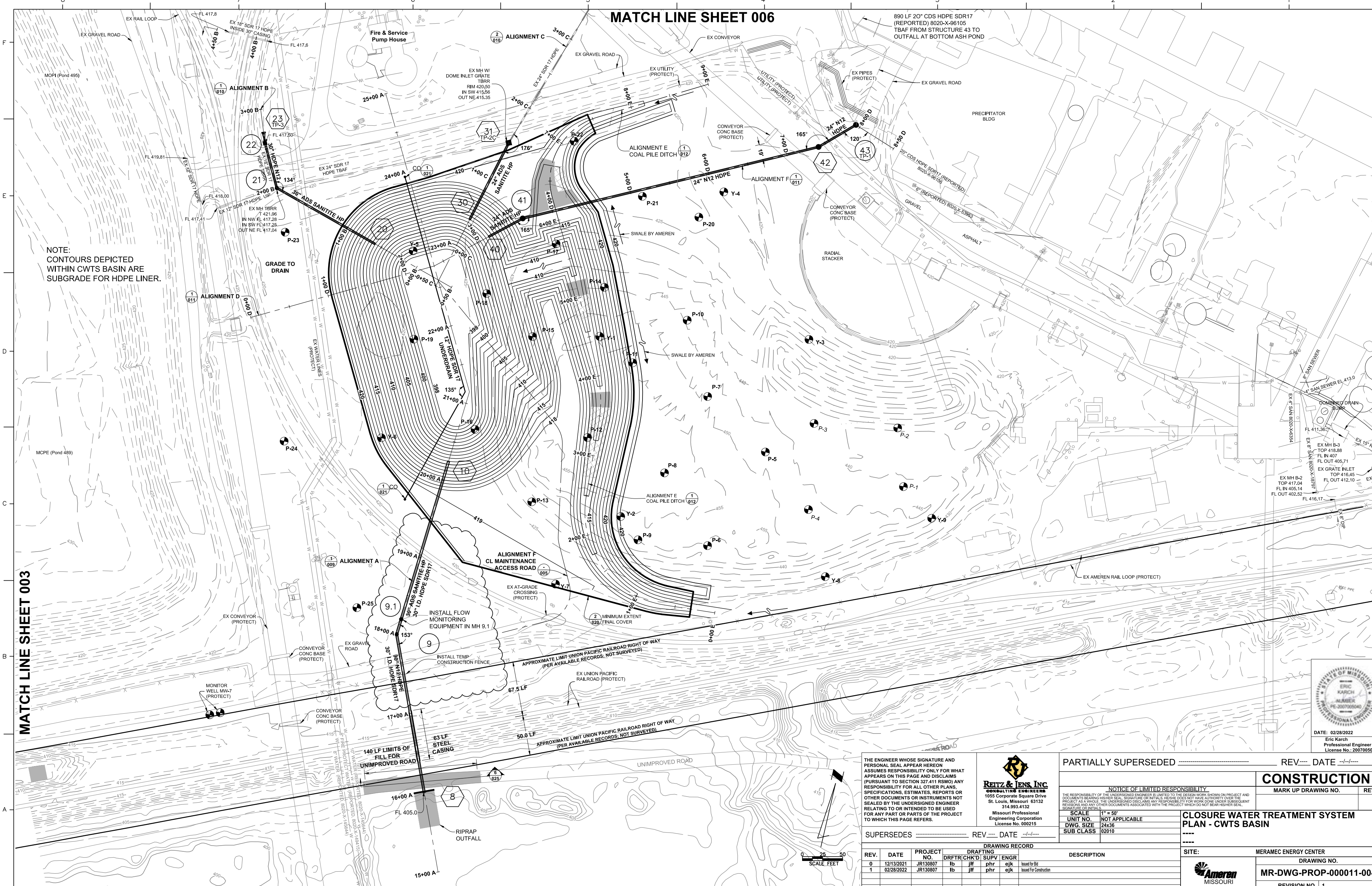
DRAWING NO. MR-DWG-PROP-000011-003

REVISION NO. 1



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SCALE	1" = 50'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PLAN - CWTS BASIN

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

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MR-DWG-PROP-000011-004

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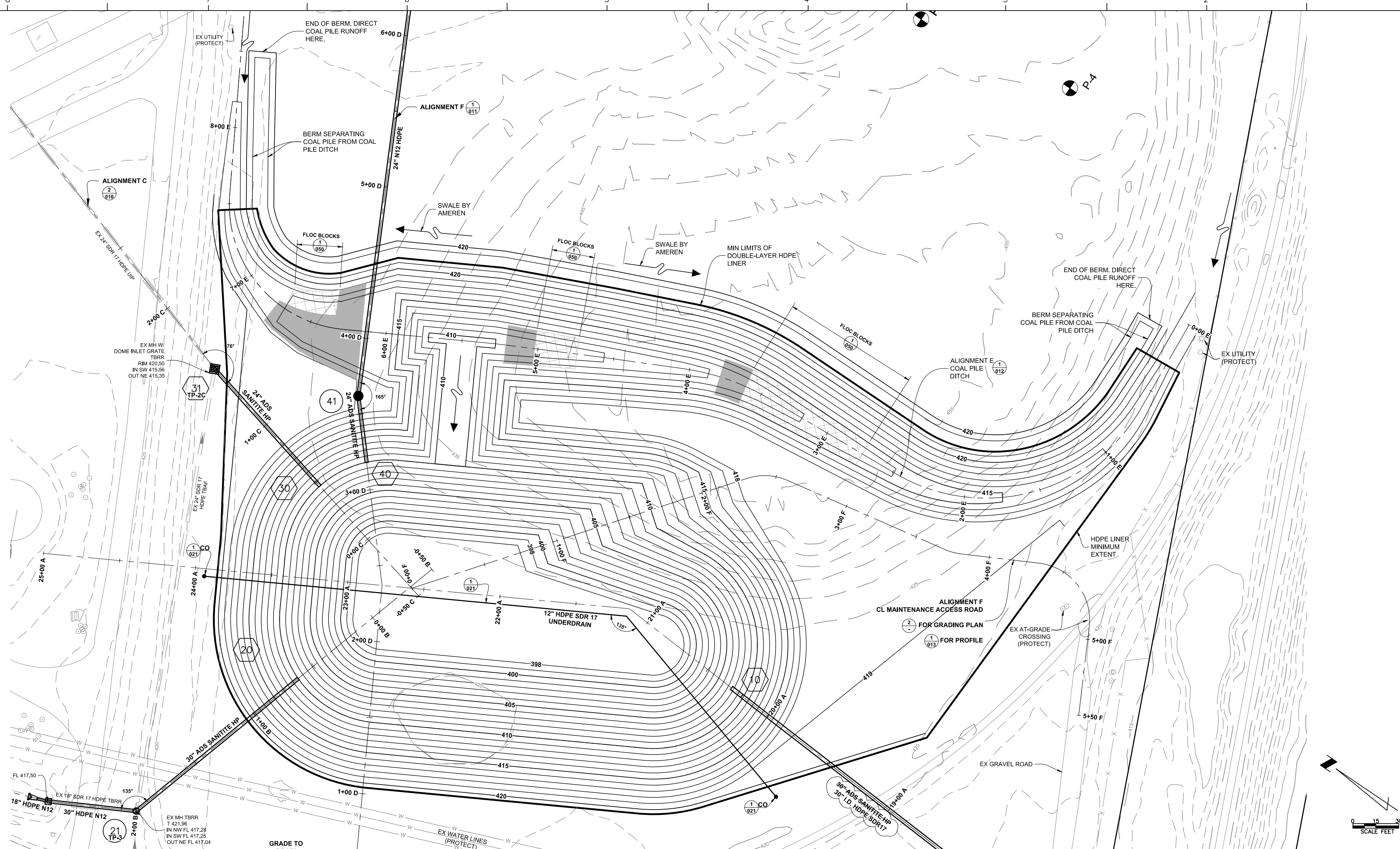

NOTE:
CONTOURS DEPICTED WITHIN CWTS BASIN ARE SUBGRADE FOR HDPE LINER.

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SCALE	1" = 30'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PLAN - CWTS BASIN W/ MAINTENANCE ROAD

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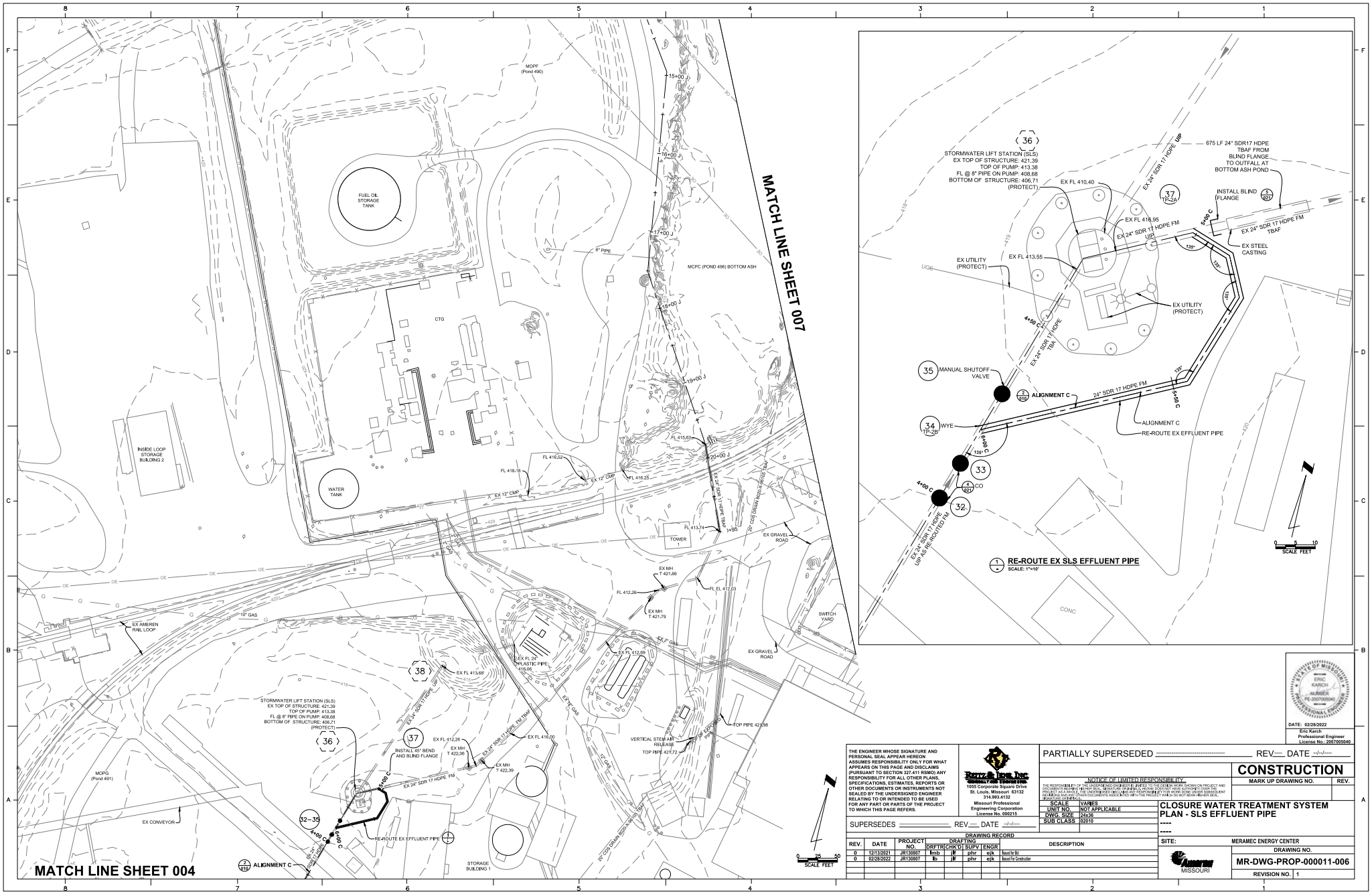

1 RE-ROUTE EX SLS EFFLUENT PIPE
SCALE: 1"=10'

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DRAWING RECORD

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0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bid
0	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

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CONSTRUCTION

MARK UP DRAWING NO. | REV.

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PLAN - SLS EFFLUENT PIPE

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PROP-000011-006

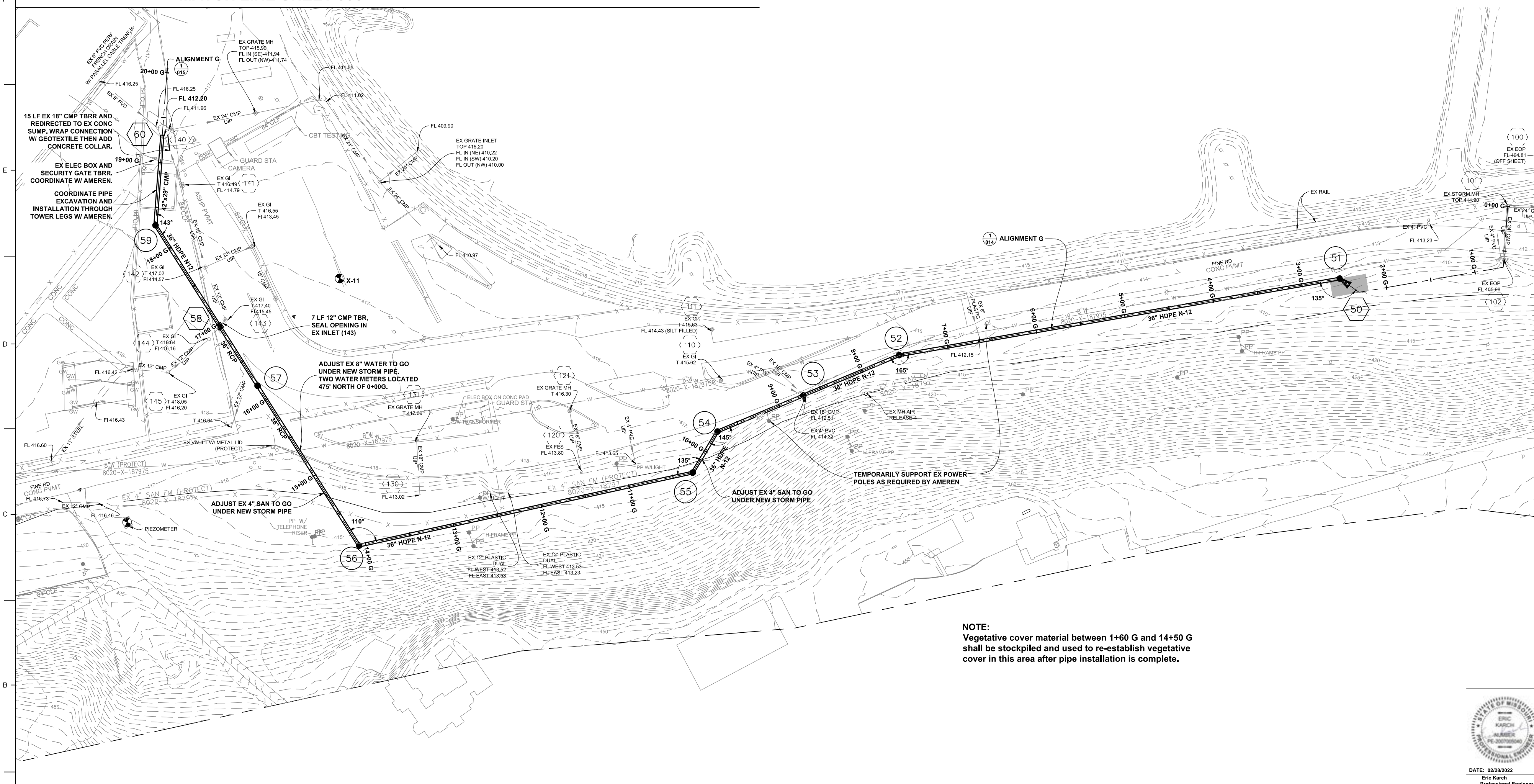
REVISION NO. 1

STATE OF MISSOURI — ERIC KARCH — NUMBER PE-2007005049 — PROFESSIONAL ENGINEER

DATE: 02/28/2022

Eric Karch
Professional Engineer
License No.: 2007005049

MATCH LINE SHEET 006



NOTE:
Vegetative cover material between 1+60 G and 14+50 G shall be stockpiled and used to re-establish vegetative cover in this area after pipe installation is complete.

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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MARK UP DRAWING NO.	REV.

SCALE	1" = 50'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PLAN - SWITCHYARD PIPE

SUPERSEDES ---------------------------- REV---- DATE --/--/----

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bidd
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

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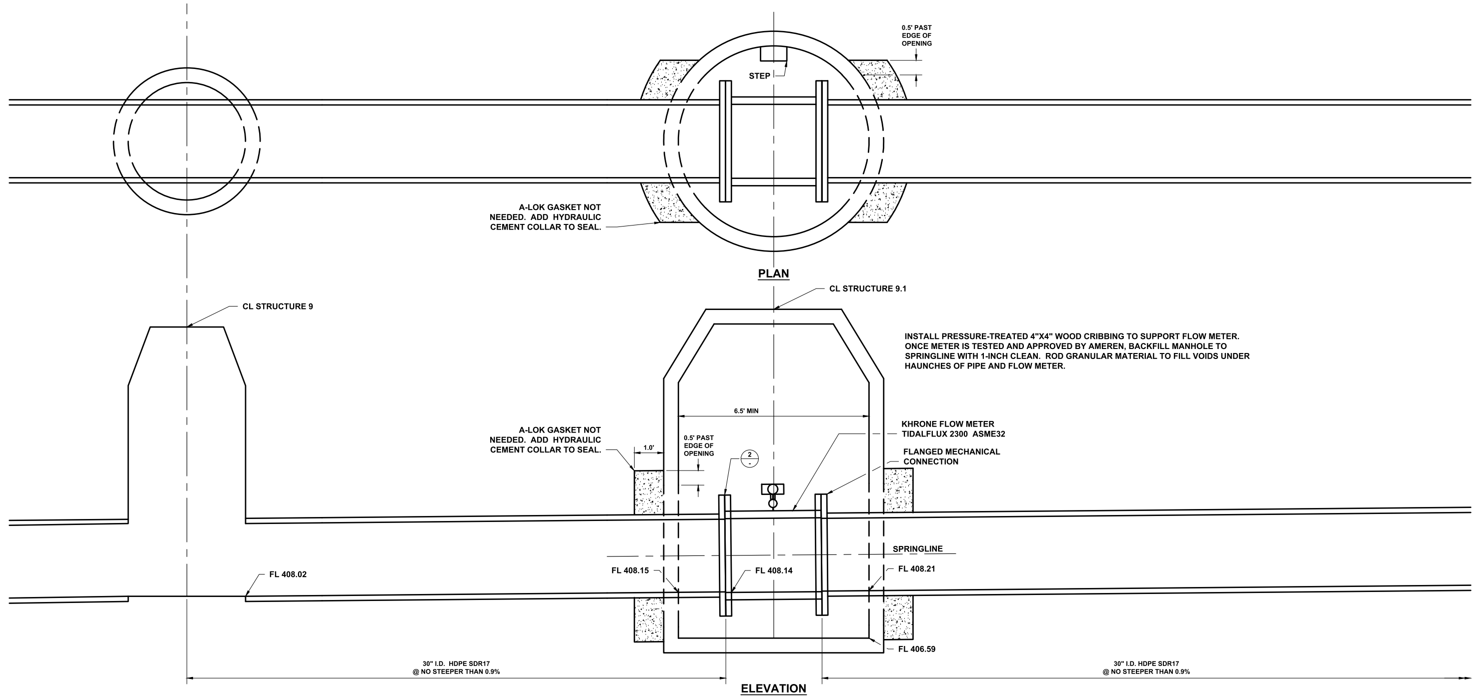
MR-DWG-PROP-000011-007
REVISION NO. 1



1 - DETAIL - FLOW METER
SCALE: 1"=2'

4.4 Grounding

The device must be grounded in accordance with regulations in order to protect personnel against electric shocks.

4.4.1 Mounting grounding rings

In order to get a reliable height measurement it is ***absolutely necessary*** *that the inner side of the connecting pipeline is electrically conductive and connected to ground. If not, tailor-made grounding rings with a cylindrical part can be delivered. Please contact your local agency in case of doubt.*

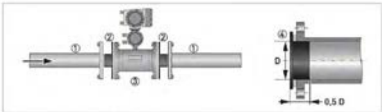


Figure 4-1: Grounding with grounding rings

① Existing pipeline
② Grounding rings, custom made to inner diameter of pipeline
③ TIDALFLUX
④ Insert the cylindrical part of the grounding ring into the pipeline. Use an appropiate gasket between the grounding ring and the flange.

Sizes of the grounding rings are diameter dependent and available on request.

For the connection diagrams and more information on connection of the sensor, please refer to the manual of the TIDALFLUX 2300 and the applicable signal converter.

2 - DETAIL - GROUNDING RINGS
NO SCALE

NOTE:
Contractor shall consult with manufacturer of flow meter for complete installation instructions. However, the following excerpt of the Tidalflux 2300 F Technical Datasheet is provided because it interacts with the flanged mechanical connection.

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Professional Engineer
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MARK UP DRAWING NO.	REV.

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM
DETAILS - ALIGNMENT A

SUPERSEDES ---------------- REV---- DATE --/--/----

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

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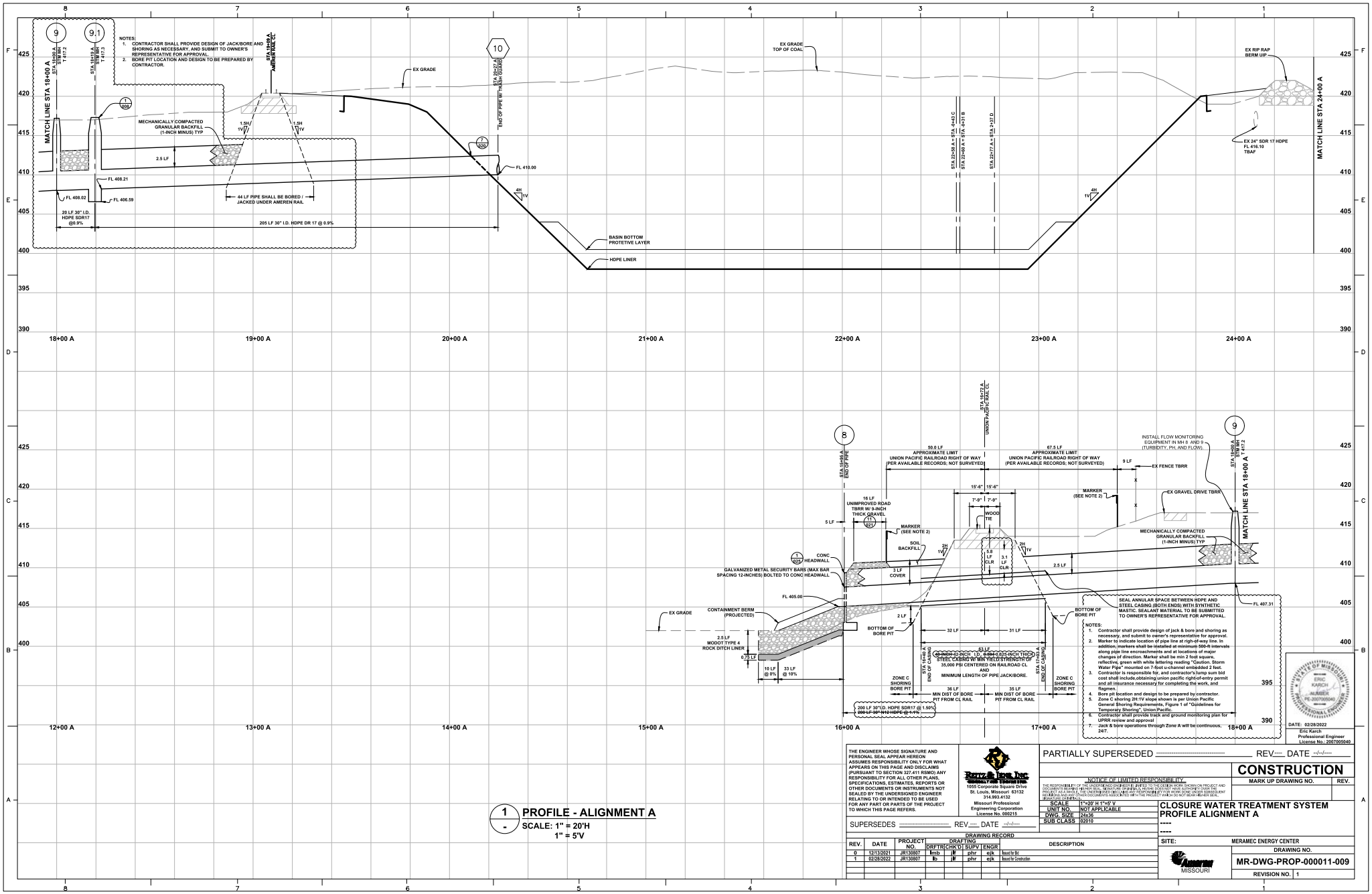

1 PROFILE - ALIGNMENT A
SCALE: 1" = 20'H
1" = 5'V

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REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued for Construction

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SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PROFILE ALIGNMENT A

SITE: MERAMEC ENERGY CENTER

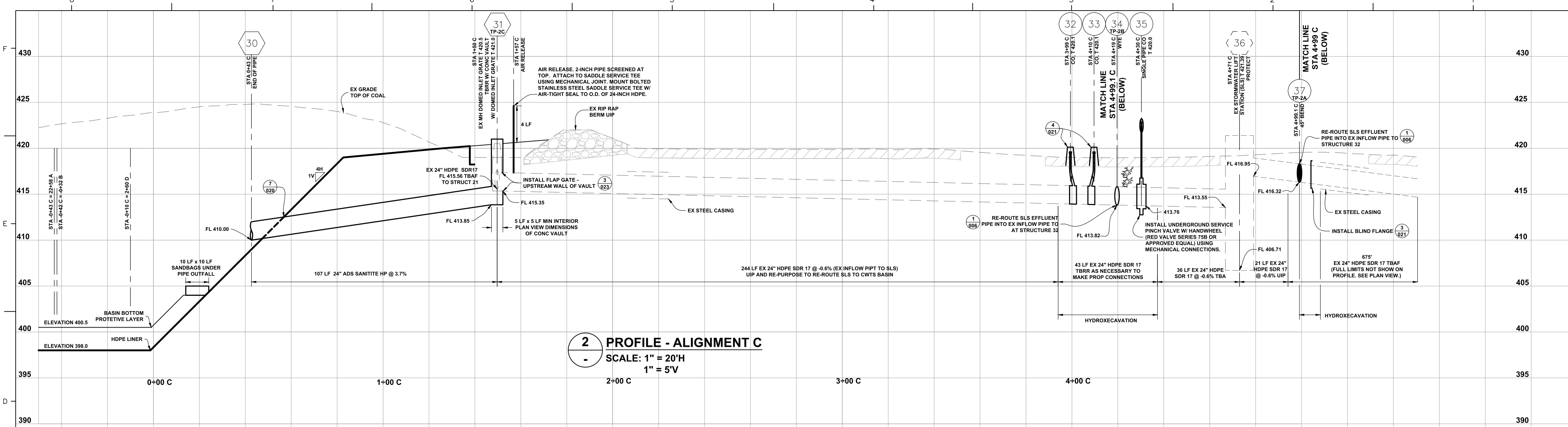
DRAWING NO.
MR-DWG-PROP-000011-009

REVISION NO. 1

Ameren MISSOURI

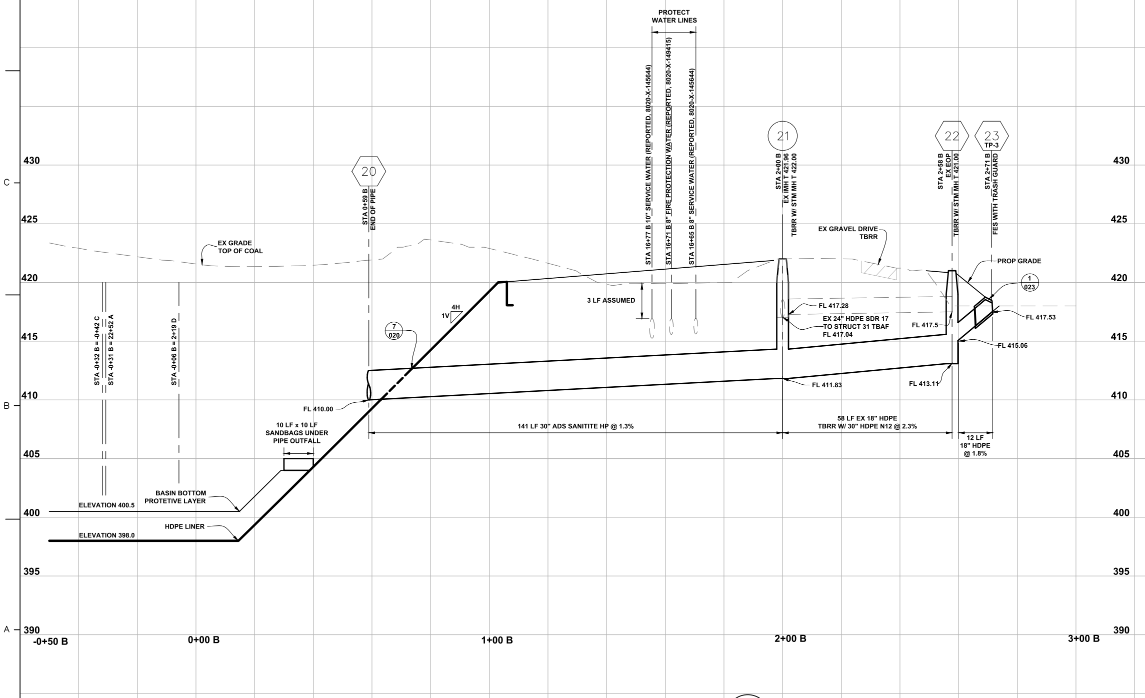
STATE OF MISSOURI — ERIC KARCH — NUMBER PE-2007005049 — PROFESSIONAL ENGINEER

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005049



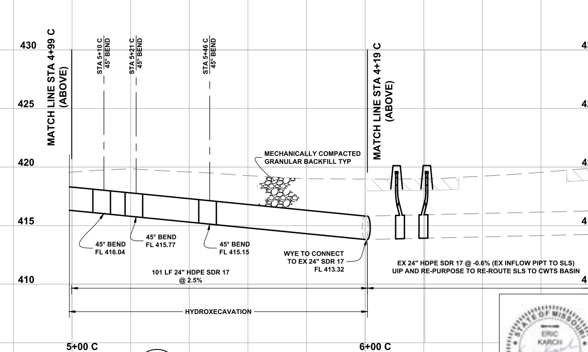
2 PROFILE - ALIGNMENT C

SCALE: 1" = 20'H
1" = 5'V



1 PROFILE - ALIGNMENT B

SCALE: 1" = 20'H
1" = 5'V



2 PROFILE - ALIGNMENT C

SCALE: 1" = 20'H
1" = 5'V

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM PROFILE ALIGNMENT B, C

SITE: MERAMEC ENERGY CENTER

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

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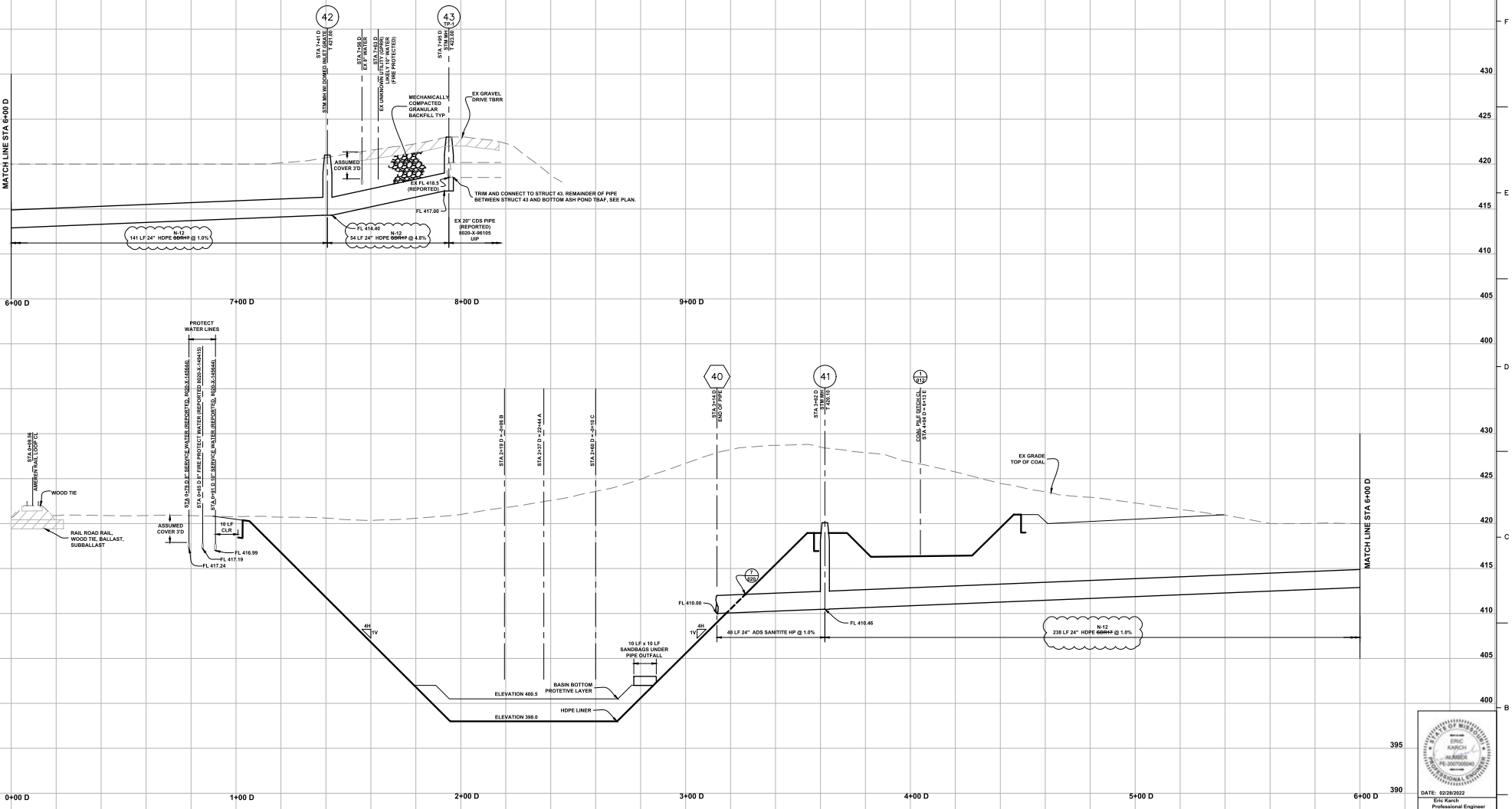
MR-DWG-PROP-000011-010

REVISION NO. 1



1 PROFILE - ALIGNMENT D

SCALE: 1" = 20'H
1" = 5'V

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SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jf	phr	ejk	Issued for Bid
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CLOSURE WATER TREATMENT SYSTEM PROFILE ALIGNMENT D

SITE: MERAMEC ENERGY CENTER

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MR-DWG-PROP-000011-011

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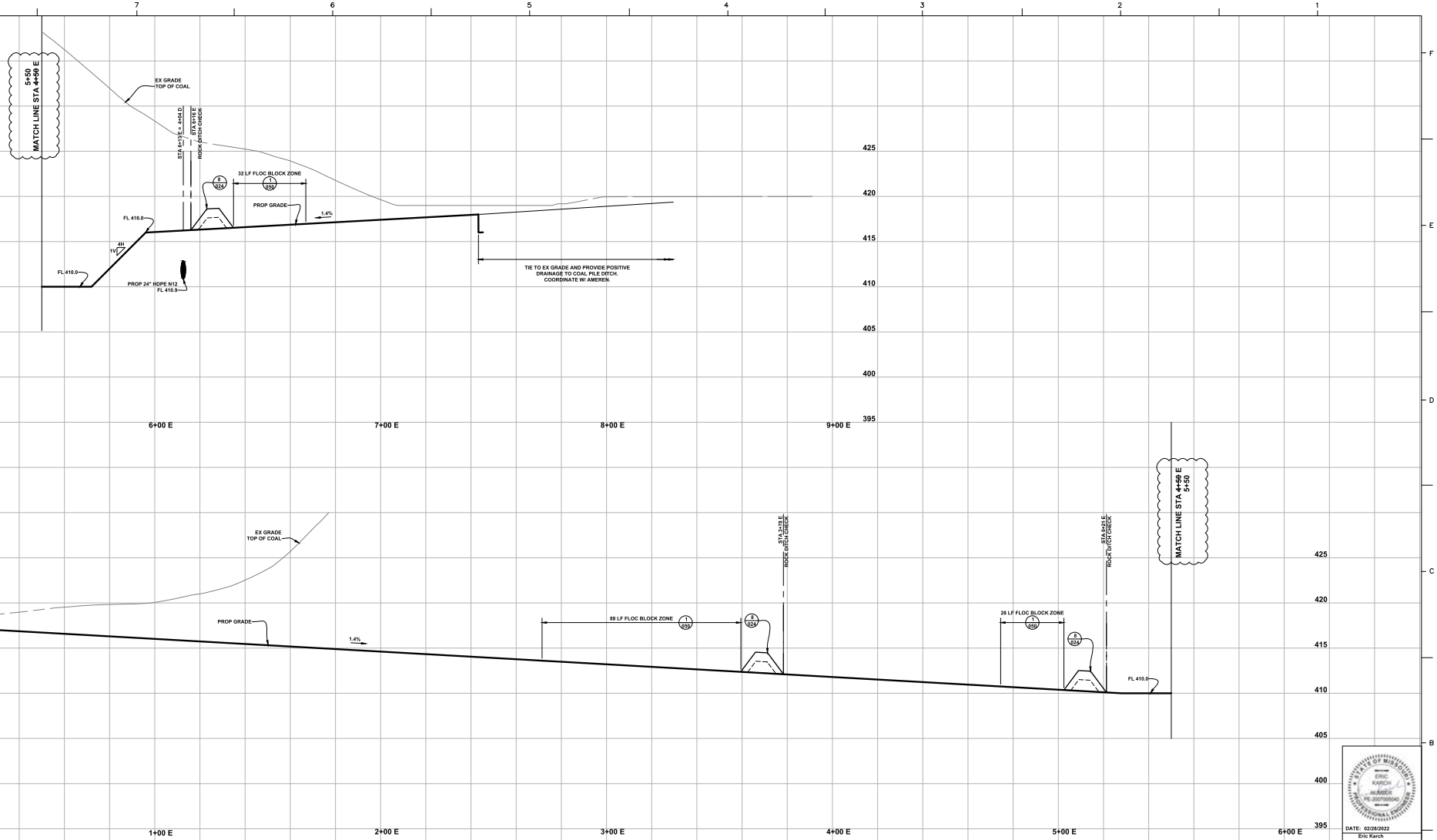
DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005049



1 / - PROFILE - ALIGNMENT E - COAL PILE DITCH
SCALE: 1" = 20'H
1" = 5'V

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SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM
PROFILE ALIGNMENT E

SITE: MERAMEC ENERGY CENTER

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MR-DWG-PROP-000011-012
REVISION NO. 1

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0	11/25/2021	JR130807	lb	jf	phr	ejk	Issued for Bid
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ERIC KARCH
NUMBER PE-2007005049
PROFESSIONAL ENGINEER

DATE: 02/28/2022
Eric Karch
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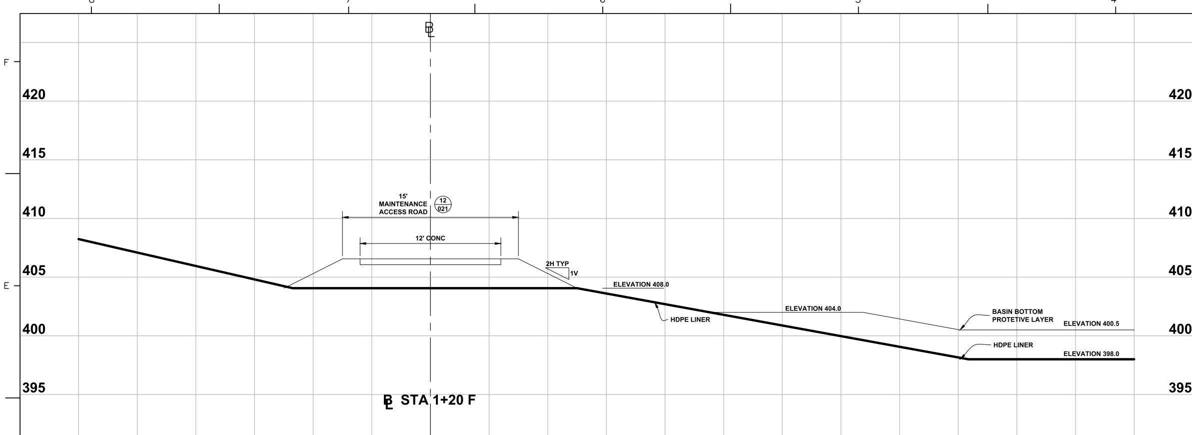
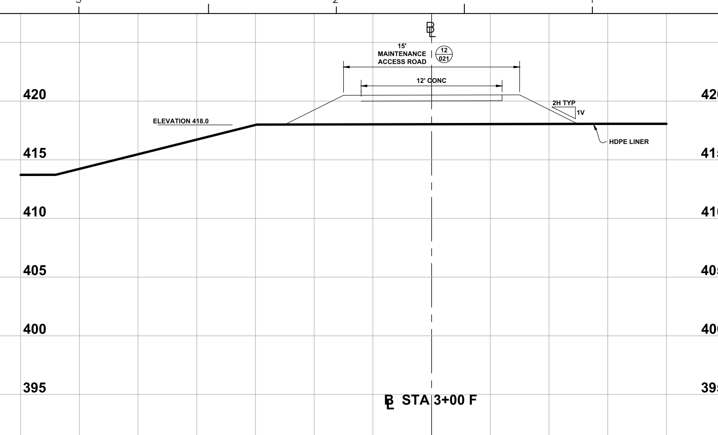
License No.: 2007005049



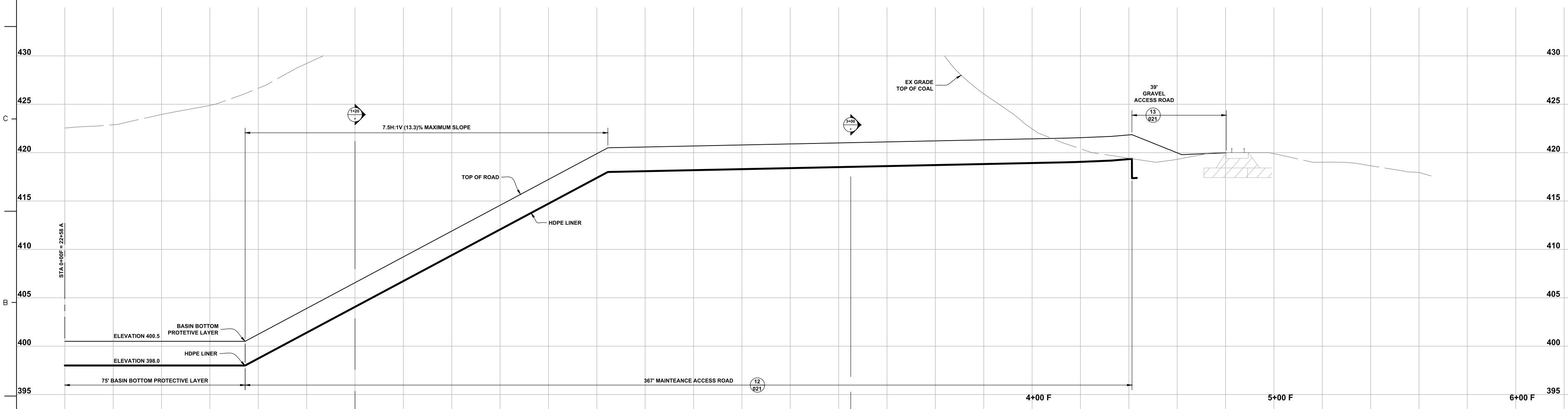
SECTION - ALIGNMENT F - MAINTENANCE ACCESS ROAD

SCALE: 1" = 5'H
1" = 5'V



SECTION - ALIGNMENT F - MAINTENANCE ACCESS ROAD

SCALE: 1" = 5'H
1" = 5'V



0+00 F   1+00 F   2+00 F   3+00 F

1 PROFILE - ALIGNMENT F - MAINTENANCE ACCESS ROAD

SCALE: 1" = 20'H
1" = 5'V

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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MARK UP DRAWING NO.	REV.

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

SUPERSEDES ---------------- REV---- DATE --/--/----

CLOSURE WATER TREATMENT SYSTEM
PROFILE & SECTIONS ALIGNMENT F

DRAWING RECORD

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0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
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SITE: MERAMEC ENERGY CENTER

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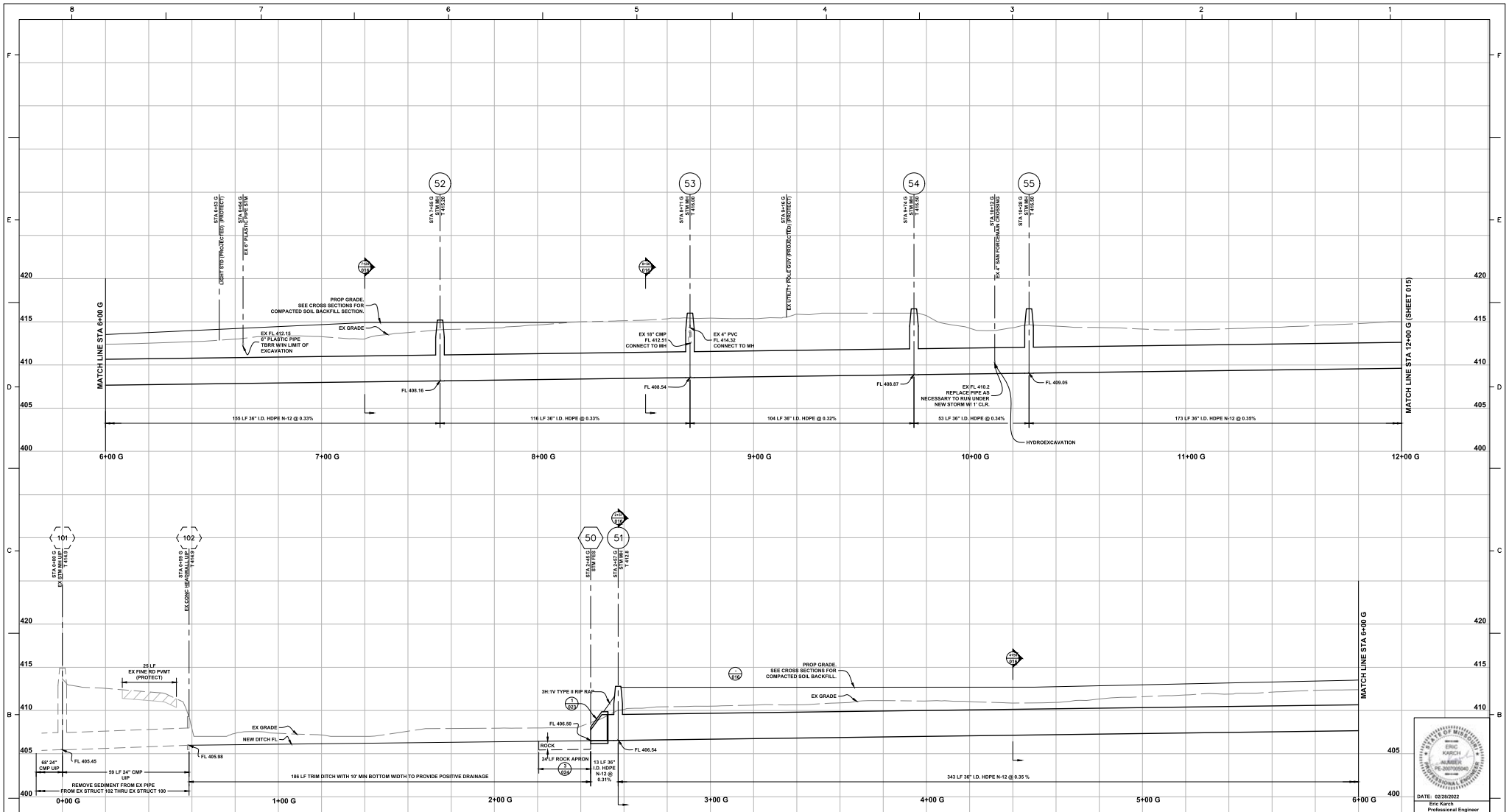
REVISION NO. 1



PROFILE - ALIGNMENT G

SCALE: 1" = 20'H
1" = 5'V

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SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

DRAWING RECORD

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CLOSURE WATER TREATMENT SYSTEM
PROFILE ALIGNMENT G

SITE: MERAMEC ENERGY CENTER

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MR-DWG-PROP-000011-014
REVISION NO. 1

STATE OF MISSOURI
ERIC KARCH
NUMBER PE-2007005049
PROFESSIONAL ENGINEER

DATE: 02/28/2022
Eric Karch
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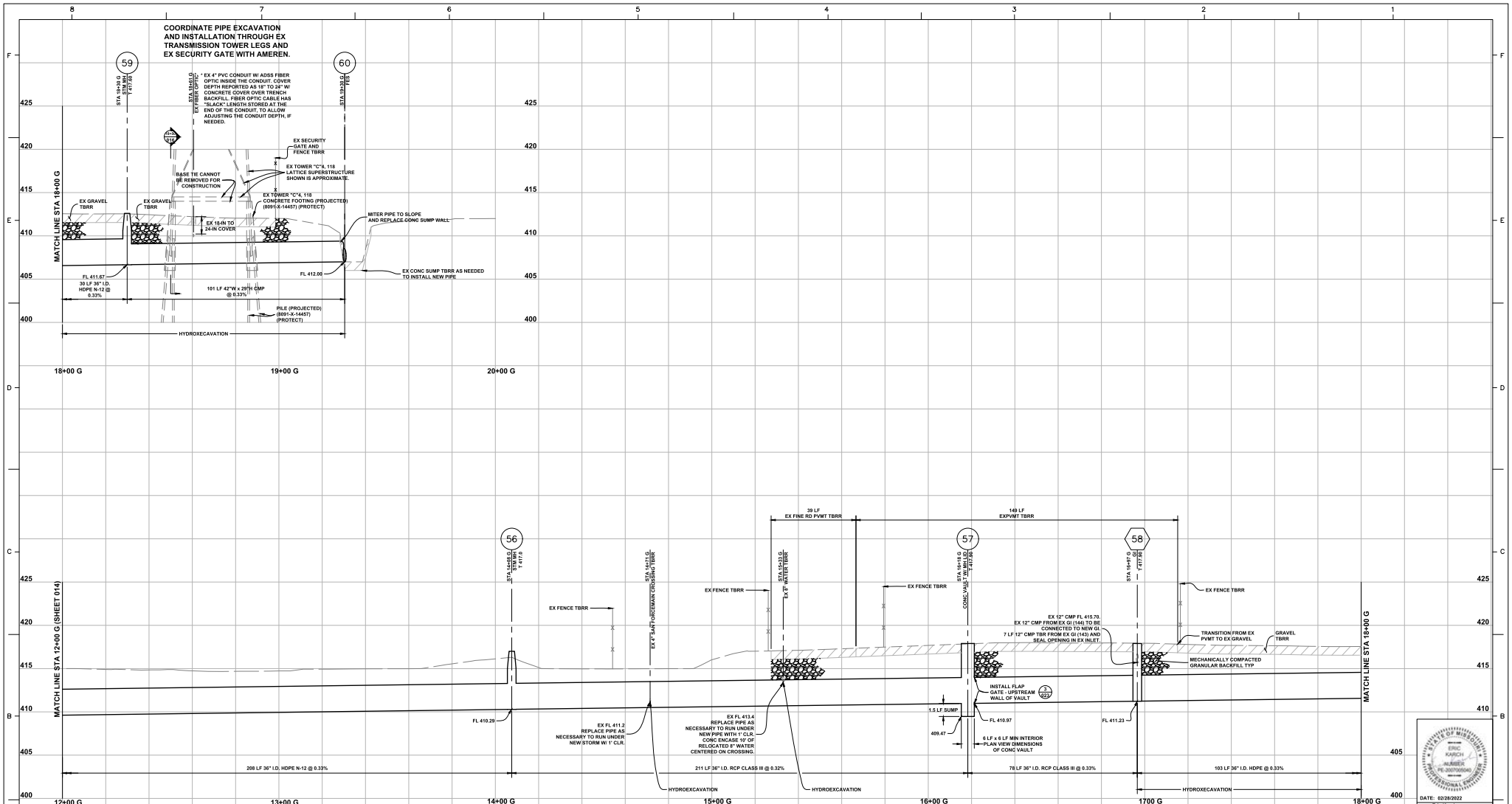
License No.: 2007005049



1 / - **PROFILE - ALIGNMENT G**
SCALE: 1" = 20'H
1" = 5'V

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SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM
PROFILE ALIGNMENT G

SITE: MERAMEC ENERGY CENTER

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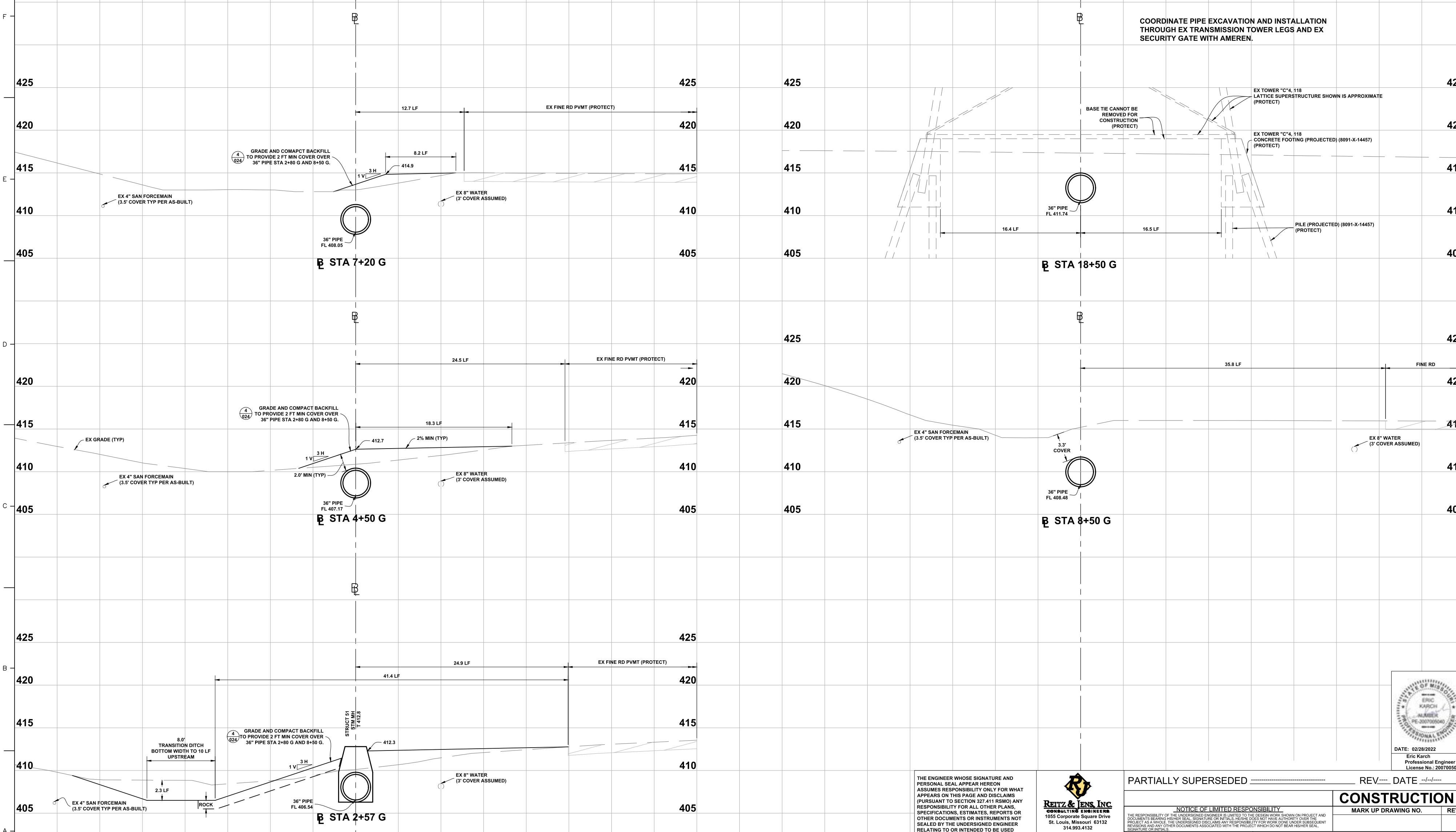
MR-DWG-PROP-000011-015
REVISION NO. 1

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

STATE OF MISSOURI
ERIC KARCH
NUMBER PE-2007005049
PROFESSIONAL ENGINEER
DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005049



SECTIONS - ALIGNMENT G

SCALE: 1" = 5'H
1" = 5'V

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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CONSTRUCTION

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MARK UP DRAWING NO.	REV.

SCALE	1"=5' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM
SECTIONS ALIGNMENT G

SITE: MERAMEC ENERGY CENTER

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

Ameren MISSOURI

DRAWING NO.
MR-DWG-PROP-000011-016
REVISION NO. 1

New Structure Table

Structure #	Control Point #	Coordinates N	Coordinates E	Description	
8	5999	866511.96	934296.01	STA 16+00.98 A	END OF 30" PIPE
9	6000	866434.43	934479.31	STA 18+00 A	MH
9.1	6001	866435.68	934498.77	STA 18+19.5 A	MH
10	6002	866448.82	934703.53	STA 20+24.68 A	END OF 30" PIPE
20	6006	866298.22	934946.45	STA 0+59.83 B	END OF 30" PIPE
21	6007	866163.89	934986.49	STA 2+00 B	MH
22	6008	866136.96	935037.59	STA 2+57.76 B	MH
23	6010	866132.28	935050.27	STA 2+71.27 B	18" FES
30	6012	866406.56	935002.46	STA 0+42.69 C	END OF 24" PIPE
31	6013	866432.42	935106.3	STA 1+49.7 C	INLET MH TBRR
32	6014	866509.24	935343.81	STA 3+99.32 C	CLEANOUT
33	6015	866512.41	935353.6	STA 4+9.62 C	CLEANOUT
34	6016	866515.72	935363.23	STA 4+19.62 C	REROUTE SLS
35	6017	866518.76	935373.25	STA 4+30.27 C	VALVE
36	6018	866531.14	935411.53	STA 4+70.5 C	SLS
37	6020	866556.81	935424.15	STA 4+99.1 C	REROUTE SLS
40	6027	866434.40	934986.93	STA 3+13.97 D	END OF 24" PIPE
41	6028	866470.45	935018.58	STA 3+61.94 D	MH
42	6029	866809.01	935188.29	STA 7+40.64 D	INLET MH
43	6030	866848.18	935225.51	STA 7+94.69 D	MH
50	6055	866758.54	937201.24	STA 2+44.56 G	36" FES
51	6056	866756.34	937188.7	STA 2+57.29 G	MH
52	6057	867042.21	936781.48	STA 7+54.83 G	MH
53	6058	867128.2	936704.04	STA 8+70.54 G	MH
54	6059	867205.23	936634.67	STA 9+74.21 G	MH
55	6060	867258.24	936629.23	STA 10+27.50 G	MH
56	6061	867489.88	936327.92	STA 14+07.56 G	MH
57	6062	867377.17	936149.92	STA 16+18.25 G	6'X6' VAULT
58	6063	867335.29	936083.77	STA 16+96.54 G	GI
59	6064	867263.96	935971.12	STA 18+29.87 G	MH
60	6065	867170.07	935935.26	STA 19+30.37 G	END OF 42"X29" PIPE

Point Table

Control Point #	Coordinates N	Coordinates E	Description
5998	866551.29	934203.01	STA 15+00 A
5999	866511.96	934296.01	STA 16+00.98 A
6000	866434.43	934479.31	STA 18+00 A
6001	866435.68	934498.77	STA 18+19.5 A
6002	866448.82	934703.53	STA 20+24.68 A
6003	866454.60	934793.56	STA 21+14.90 A
6004	866269.58	935131.30	STA 25+00 A
6005	866403.47	934915.07	STA -0+50 B
6006	866298.22	934946.45	STA 0+59.83 B
6007	866163.89	934986.49	STA 2+00 B
6008	866136.96	935037.59	STA 2+57.76 B
6009	866132.28	935050.27	STA 2+71.27 B
6010	866122.32	935077.21	STA 3+00 B
6011	866384.17	934912.52	STA -0+50 C
6012	866406.56	935002.46	STA 0+42.69 C
6013	866432.42	935106.30	STA 1+49.70 C
6014	866509.24	935343.81	STA 3+99.32 C
6015	866512.41	935353.6	STA 4+9.62 C
6016	866515.72	935363.23	STA 4+19.62 C, STA 6+00C
6017	866518.76	935373.25	STA 4+30.27 C
6018	866531.14	935411.53	STA 4+70.50 C
6019	866538.63	935415.21	STA 4+78.84 C
6020	866556.81	935424.15	STA 4+99.10 C
6021	866567.22	935420.61	STA 5+10.10 C
6022	866572.08	935410.74	STA 5+21.10 C
6023	866563.98	935386.97	STA 5+46.21 C
6025	866168.70	934822.28	STA 0+00 D
6026	866376.50	934936.12	STA 2+36.94 D
6027	866434.40	934986.93	STA 3+13.97 D
6028	866470.45	935018.58	STA 3+61.94 D
6029	866809.01	935188.29	STA 7+40.65 D
6030	866848.18	935225.51	STA 7+94.69 D
6031	866900.37	935207.19	STA 8+50 D
6032	866813.97	934594.65	STA 0+00 E
6033	866750.87	934590.01	STA 0+63.27 E PC OF CURVE 1
6034	866625.50	934699.71	STA 2+48.65 E PT OF CURVE 1
6035	866619.83	934794.61	STA 3+43.72 E PC OF CURVE 2
6036	866604.58	934852.45	STA 4+03.93 E PT OF CURVE 2
6037	866581.47	934899.58	STA 4+56.43 E
6038	866549.12	934963.43	STA 5+28 E
6039	866538.55	934982.72	STA 5+50 E
6040	866518.37	935019.56	STA 5+92 E
6041	866500.92	935051.41	STA 6+28.32 E PC OF CURVE 3
6042	866532.33	935162.11	STA 7+55.86 E PT OF CURVE 3
6043	866657.66	935233.31	STA 9+00 F
6044	866385.92	934918.92	STA 0+00 F
6045	866568.31	934777.87	STA 2+30.57 F PC OF CURVE 4
6046	866582.25	934754.97	STA 2+57.99 F PT OF CURVE 4
6047	866602.51	934644.52	STA 3+70.28 F PC OF CURVE 5
6048	866606.08	934634.07	STA 3+81.36 F PT OF CURVE 5
6049	866629.70	934588.36	STA 4+32.81 F PC OF CURVE 6
6050	866613.60	934537.83	STA 4+91.72 F PT OF CURVE 6
6051	866561.82	934511.07	STA 5+50 F
6052	866603.86	937323.55	STA 0+00 G
6053	866667.39	937347.97	STA 0+68.07 G
6054	866760.91	937214.76	STA 2+30.83 G
6055	866758.54	937201.24	STA 2+44.56 G
6056	866756.34	937188.70	STA 2+57.29 G
6057	867042.21	936781.48	STA 7+54.83 G
6058	867128.2	936704.04	STA 8+70.54 G
6059	867205.23	936634.67	STA 9+74.21 G
6060	867258.24	936629.23	STA 10+27.50 G
6061	867489.88	936327.92	STA 14+07.56 G
6062	867377.17	936149.92	STA 16+18.25 G
6063	867335.29	936083.77	STA 16+96.54 G
6064	867263.96	935971.12	STA 18+29.88 G
6065	867170.07	935935.26	STA 19+30.37 G
6066	867105.03	935910.41	STA 20+00 G

ERIC KARCH
NUMBER PE-2007005040
PROFESSIONAL ENGINEER

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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SCALE	1" = 50'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM
SURVEY COORDINATE TABLE

DRAWING RECORD

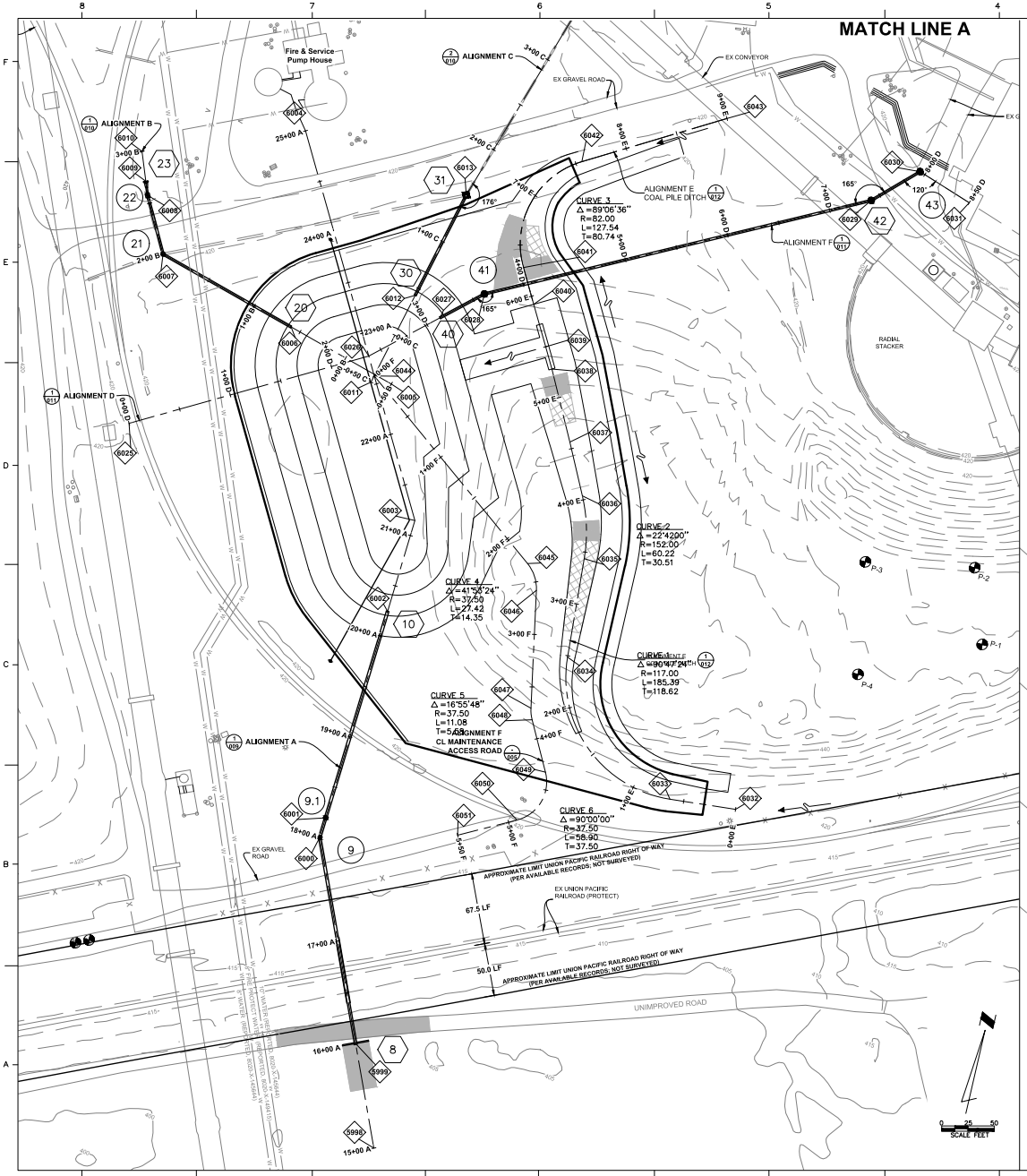
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO.
MR-DWG-PROP-000011-017

REVISION NO. 1



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SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM SURVEY COORDINATE PLAN

SITE: MERAMEC ENERGY CENTER

DRAWING NO.

MR-DWG-PROP-000011-018

REVISION NO. 1

DRAWING RECORD

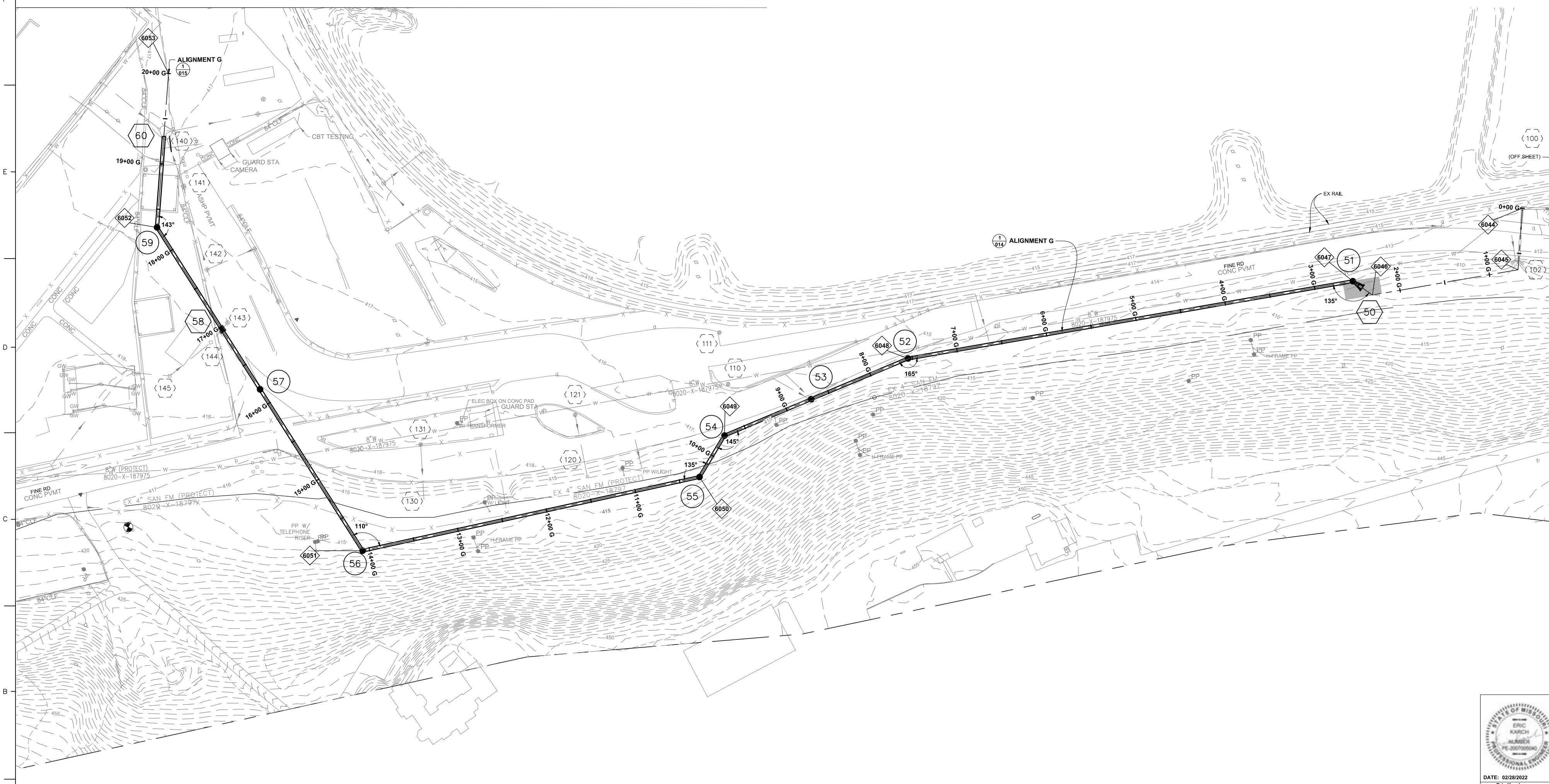
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jf	phr	ejk	Issued for Construction

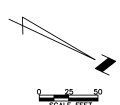
STATE OF MISSOURI — ERIC KARCH — NUMBER PE-2007005049 — PROFESSIONAL ENGINEER

DATE: 02/28/2022

Eric Karch
Professional Engineer
License No.: 2007005049

MISSOURI





DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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SCALE	1" = 50'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM SURVEY COORDINATE PLAN

SUPERSEDES ---------------------------- REV---- DATE --/--/----

DRAWING RECORD

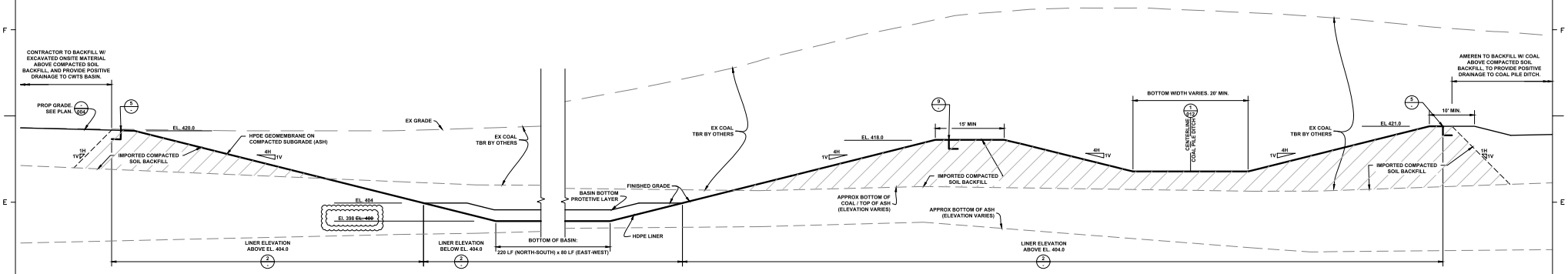
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bidd
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO.
MR-DWG-PROP-000011-019

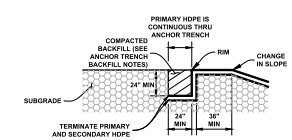
REVISION NO. 1



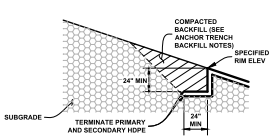
1 TYPICAL SECTION - CWTS BASIN
NOT TO SCALE

ANCHOR TRENCH BACKFILL:

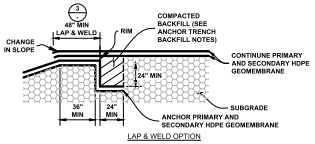
1. See Project Specifications section 02342, Section 3.4 for Anchor Trench backfill material and compaction.



5 ANCHOR TRENCH
TERMINATE HDPE AT TOP OF SLOPE
NO SCALE



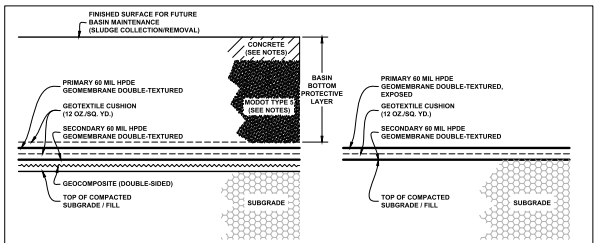
6 ANCHOR TRENCH
TERMINATE HDPE ON CONTINUOUS GRADE
NO SCALE



9 ANCHOR TRENCH
CONTINUE AT TOP OF SLOPE
NO SCALE

HDPE GEOMEMBRANE LINER & GEOCOMPOSITE NOTES:

1. HDPE Geomembrane Liner shall be 60 mil colored white on one side and double-textured.
2. All outside edges of geocomposite shall be lapped with non-woven geotextile per 4

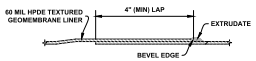


BASIN ELEVATION BELOW 404.0

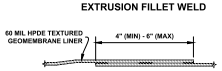
BASIN ELEVATION ABOVE 404.0

NOTES:
1. Concrete shall be fiber-reinforced:
   1.1. For floor of CWTS basin = 6-in thick concrete w/ 7-inch slump, 2500 PSI over 24-inch thick MODOT Type 5
   1.2. For sidewall of CWTS basin = 4-in thick shot-crete over 24-in thick MODOT Type 5

2 CWTS BASIN LINER
NOT TO SCALE

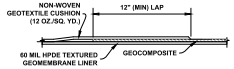


EXTRUSION FILLET WELD



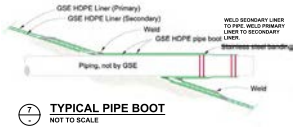
DOUBLE WEDGE FUSION WELD

3 TYPICAL FUSION AND EXTRUSION WELDS
NO SCALE

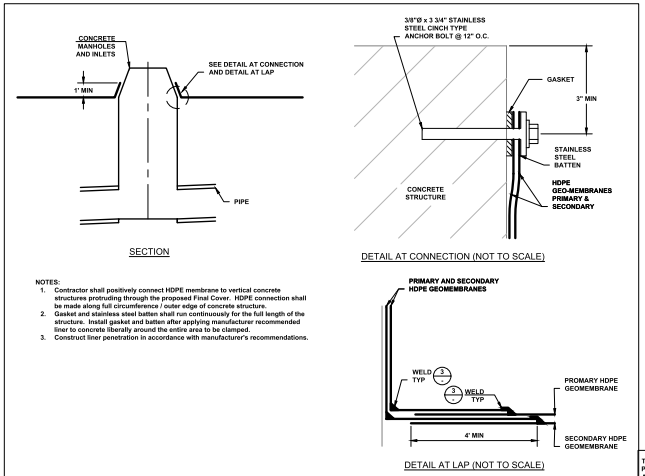


NOTE: Cut edges of the geonet without geotextile shall be covered with a piece of the same geotextile as on the composite overlapped 12 inches minimum on the bottom and top of the composite.

4 TYPICAL GEOCOMPOSITE EDGE
NO SCALE



7 TYPICAL PIPE BOOT
NOT TO SCALE



NOTES:
1. Contractor shall positively connect HDPE membrane to vertical concrete structures protruding through the proposed Final Cover. HDPE connection shall be made along full circumference / outer edge of concrete structure.
2. Gasket and stainless steel batten shall run continuously for the full length of the structure. Install gasket and batten after applying manufacturer recommended liner to concrete liberally around the entire area to be clamped.
3. Construct liner penetration in accordance with manufacturer's recommendations.

8 FINAL COVER AT VERTICAL CONCRETE STRUCTURE
SCALE: 1"=4'

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CONSTRUCTION

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SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jf	phr	ejk	Issued for Construction

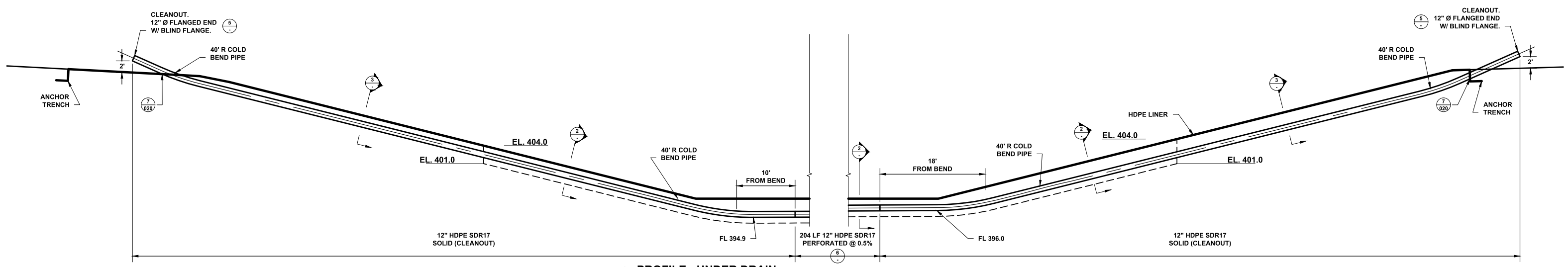
CLOSURE WATER TREATMENT SYSTEM DETAILS - HDPE LINER

SITE: MERAMEC ENERGY CENTER

DRAWING NO. MR-DWG-PROP-000011-020

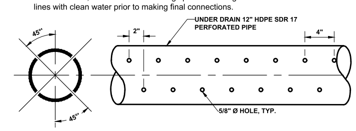
REVISION NO. 1

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

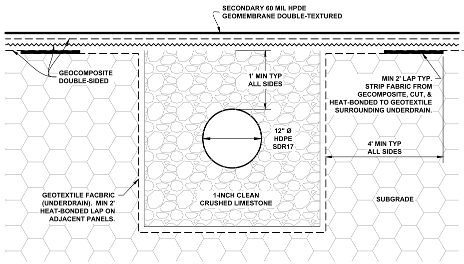


1 PROFILE - UNDER DRAIN
NO SCALE

NOTES:
1. Contractor shall provide manufacturer-supplied perforated pipe, or shop-drill all orifices prior to delivering perforated pipes to site using a clean and sharp bit to minimize burrs, and shall clean windings prior to making final connections. Flush lines with clean water prior to making final connections.

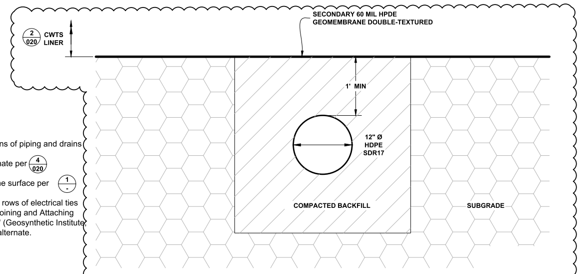


6 HDPE PERFORATED PIPE DETAIL
NOT TO SCALE

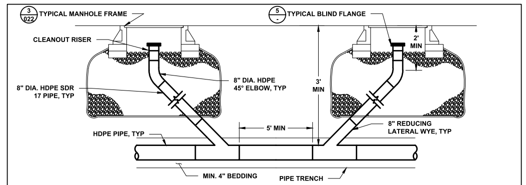


2 TYPICAL SECTION - UNDER DRAIN - GRANULAR BEDDING
NOT TO SCALE

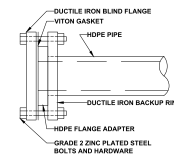
NOTES:
1. See plan view and profile for locations of piping and drains
2. All geocomposite edges shall terminate per 4/020
3. Cleanout shall extend vertically to the surface per 1
4. All geocomposite laps shall use two rows of electrical ties and field bond geotextile laps per "Joining and Attaching Geonets and Drainage Composites" (Geosynthetic Institute September 25, 2012), or approved alternate.



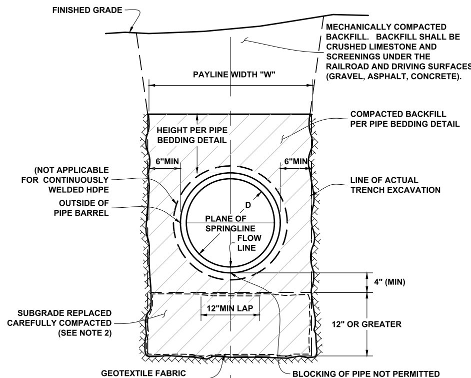
3 TYPICAL SECTION - UNDER DRAIN - SUBGRADE BEDDING
NOT TO SCALE



4 TYPICAL DUAL PIPE CLEANOUT
NOT TO SCALE

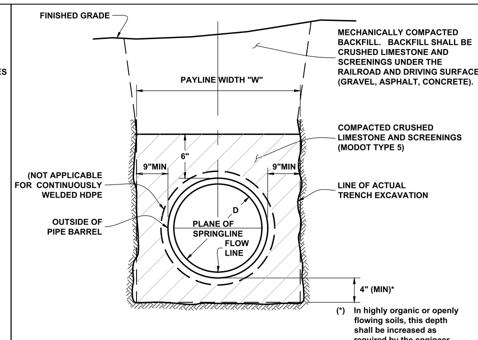


5 TYPICAL BLIND FLANGE
NOT TO SCALE



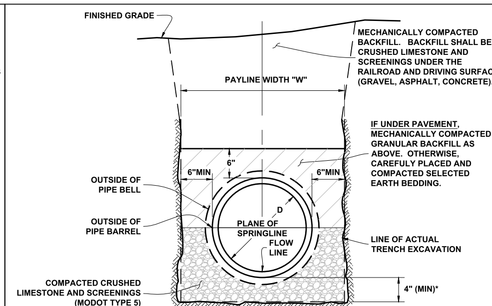
NOTES:
1. Check grade of pipe after compaction to insure the desired flowline has not changed.
2. Subgrade replacement shall be compacted with hand operated vibratory compactors or similar equipment.

7 SPECIAL PIPE BEDDING DETAIL FOR UNSUITABLE SUBGRADE REPLACEMENT 12" DEPTH OR MORE
NOT TO SCALE



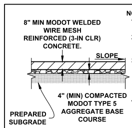
NOTES:
1. Check grade of pipe after compaction to insure the desired flowline has not changed.
2. Any trench bracing used below the top of pipe shall be left in place.
3. For installations in highly organic or openly flowing soils, the entire perimeter of the pipe bedding shall be wrapped with an approved filter fabric or the "minimum trench width" shall be expanded by increasing the distance between the side of the pipe and the line of actual excavation or trench bracing to a minimum of one pipe diameter.

8 PIPE BEDDING FOR FLEXIBLE PIPE 21" - 48" DIAMETER
NOT TO SCALE



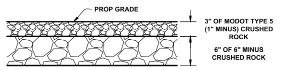
NOTES:
1. For installations in highly organic or openly flowing soils, the entire perimeter of the pipe bedding shall be wrapped with an approved filter fabric or the "minimum trench width" shall be expanded by increasing the distance between the side of the pipe and the line of actual excavation or trench bracing to a minimum of one pipe diameter.

9 PIPE BEDDING CLASS "C" (MODIFIED FOR REINFORCED CONCRETE PIPE)
NOT TO SCALE



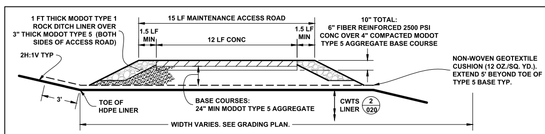
NOTE:
1. Full-slab removal and replacement is required within the limits of disturbance.
2. Dowel new rigid pavement slab into adjacent existing rigid pavement slabs per standard MODOT detail 502.10K Dowel Supporting Units.
3. Raise top of pavement elevation as needed to maintain 24" from top of concrete pavement to crown of undergound pipe. Provide gentle transition to meet flush with the top of the existing adjacent pavement.
4. Slope to drain.

10 TYPICAL SECTION - CONC PAVEMENT FINE ROAD
NO SCALE



NOTES:
1. This use typical section to re-establish disturbed portions of gravel access road. This includes within the limits of external ditch grading that are not rock lined. See Sheet 003, and External Ditch Typical Section for limits of rock lining.

11 TYPICAL SECTION - GRAVEL ACCESS ROAD
SCALE: 1"=1'



12 TYPICAL SECTION - MAINTENANCE ACCESS ROAD
NO SCALE

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314.993.4132
Missouri Professional Engineering Corporation
License No. 000215

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

PARTIALLY SUPERSEDED ---------- REV.--- DATE --/--/----

CONSTRUCTION

MARK UP DRAWING NO. | REV.

NOTICE OF LIMITED RESPONSIBILITY

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM DETAILS - PIPE, ROAD

SUPERSEDES ---------- REV.--- DATE --/--/----

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO.
MR-DWG-PROP-000011-021
REVISION NO. 1

NOTES:

1. PERFORMANCE HIGHLY DEPENDENT ON INSTALLATION. CONTRACTOR MUST ENSURE MANHOLE GASKET IS UNIFORMLY SEATED AROUND STRUCTURE ADAPTER. EXTRA PRECAUTIONS MUST BE TAKEN TO PREVENT DIFFERENTIAL SETTLEMENT BETWEEN THE PIPE AND MANHOLE.
2. SEE STANDARD DETAIL STD-201.

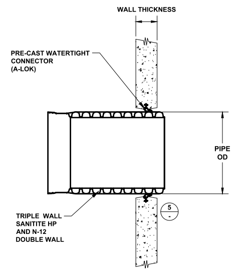
PIPE SIZE	PIPE OD	A-LOK PREMIUM CONNECTOR **	*** MIN. MH DIAMETER
12" (300mm)	14.5" (368mm)	475	– / –
*36" (900mm)	41.1" (1044mm)	1330	60" (1500mm)
42" (1050MM)	47.3" (1201mm)	1510	72" (1800mm)
48" (1200MM)	53.8" (1367mm)	1707	72" (1800mm)

*IN ORDER FOR 36" SANITITE HP TO WORK IN A 60" MANHOLE, THE WALL THICKNESS WILL NEED TO BE 6"

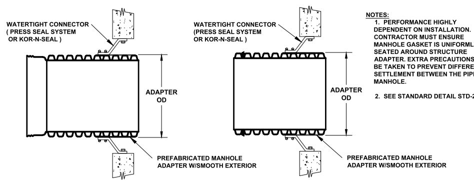
** THIRD PARTY - CODES AS SUPPLIED BY MANUFACTURER
A-LOK IS A REGISTERED TRADEMARK OF A-LOK PRODUCTS, INC. (WWW.A-LOK.COM)

***APPLICABLE FOR 140-220 DEGREE ANGLES. FOR AND OTHER ANGLE CONTACT AN ADS REPRESENTATIVE

A-LOK PREMIUM PRODUCT CODES ARE APPLICABLE TO EITHER ROUND OR FLATWALL STRUCTURES



6 / - **WATERTIGHT CONNECTION OF ADS SANITITE® HP PIPE TO CONCRETE MANHOLE USING PRE-CAST COMPRESSION GASKET (ADS STD- 205B)**
NOT TO SCALE



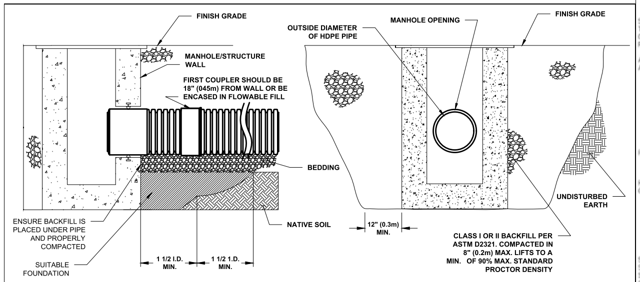
NOTES:

1. PERFORMANCE HIGHLY DEPENDENT ON INSTALLATION. CONTRACTOR MUST ENSURE MANHOLE GASKET IS UNIFORMLY SEATED AROUND STRUCTURE ADAPTER. EXTRA PRECAUTIONS MUST BE TAKEN TO PREVENT DIFFERENTIAL SETTLEMENT BETWEEN THE PIPE AND MANHOLE.
2. SEE STANDARD DETAIL STD-201.

PIPE SIZE	ADAPTER OD		ADS PRODUCT CODES: BELL END		ADS PRODUCT CODES: PLAIN END		PRESS SEAL® SYSTEMS *		KOR-N-SEAL® *	
	A-PROFILE	H-PROFILE	A-PROFILE	H-PROFILE	A-PROFILE	H-PROFILE	PSX: DIRECT DRIVE	CAST-A-SEAL	SERIES I OR II	SERIES 306
12" (300mm)	14.73" (374.1mm)	N/A	1222ANB	N/A	1222AN	N/A	18M OR 20Y	CAS 802	S106-20BWS	N/A
36" (900mm)	42.06" (1068.3mm)	42.15" (1070.6mm)	3622ANB	3622ANBH	3622AN	3622ANH	46S	CAS 802	S206-46	S306-46
42" (1050mm)	48.54" (1232.9mm)	48.75" (1238.3mm)	4222ANB	4222ANBH	4222AN	4222ANH	N/A	CAS 802	S206-52L	N/A

* THIRD PARTY - CODES AS SUPPLIED BY MANUFACTURER
PSX Systems are a product of PRESS-SEAL GASKET CORPORATION. (www.press-seal.com)
KOR-N-SEAL is a registered trademark of NPC, Inc. (www.npc.com)

7 / - **WATERTIGHT CONNECTION OF ADS N-12 PIPE (12"-60") TO CONCRETE MANHOLE USING A MANHOLE BOOT (CORED HOLE OR PRE-CAST) W/ PREFABRICATED ADAPTER**
NOT TO SCALE



NOTES:

1. MAXIMUM INSERTION ANGLE SHALL NOT EXCEED REQUIREMENTS AS SPECIFIED BY THE MANUFACTURER.
2. SEE DETAIL 6/- FOR STRUCTURE CONNECTION, PRODUCT INFORMATION AND DIMENSIONAL PIPE DATA.
3. INSTALLATION RECOMMENDATIONS ARE ALSO SPECIFIED IN TECHNICAL NOTE 5.04: HDPE CONNECTIONS TO MANHOLES AND STRUCTURES.
4. PERFORMANCE HIGHLY DEPENDENT ON INSTALLATION. CONTRACTOR MUST INSURE MANHOLE GASKET IS UNIFORMLY SEATED AROUND STRUCTURE ADAPTER. EXTRA PRECAUTIONSMUST BE TAKEN TO PREVENT DIFFERENTIAL SETTLEMENT BETWEEN THE PIPE AND MANHOLE.

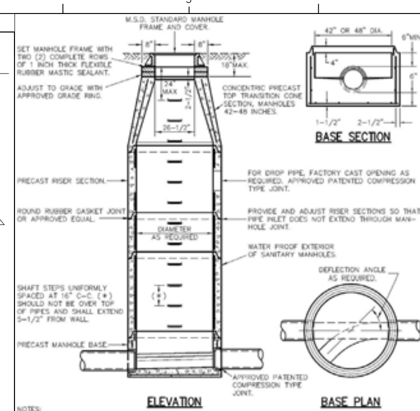
REV	DESCRIPTION	BY	REVDATE	CHK'D
REV.	DESCRIPTION	BY	MM/DD/YY	CHK'D

PROJECT LOCATION
DRAWING NUMBER: DRAWING#

ADVANCED DRAINAGE SYSTEMS, INC. 4640 TRUEMAN BLVD HILLIARD, OHIO 43026

ABC | DATE | ENG | NTS | OF

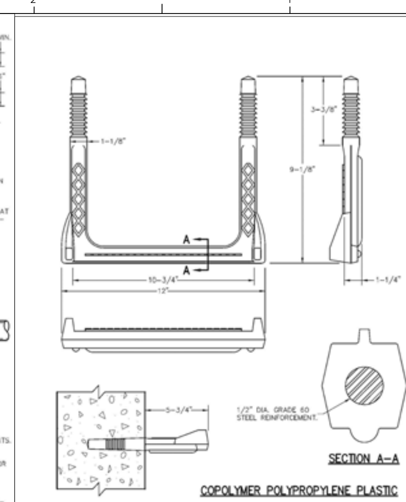
5 / - **STRUCTURE CONNECTION (HP AND HDPE PIPE TO CONCRETE MANHOLE) - INSTALLATION DETAIL**
NOT TO SCALE



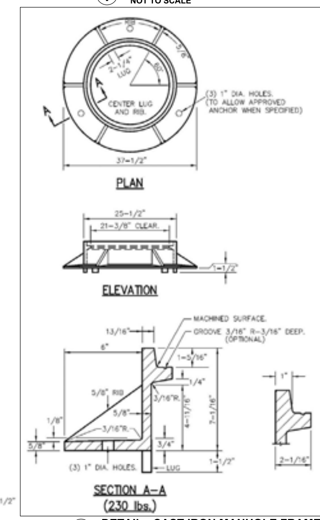
NOTES:

1) THE MINIMUM INSIDE DIAMETER FOR THE BASE AND RISER SECTIONS SHALL BE 42 INCHES FOR 8 INCH DIAMETER SANITARY SEWERS AND ALL STORM SEWERS. THE MINIMUM INSIDE DIAMETER FOR SANITARY SEWERS LARGER THAN 8 INCH DIAMETER IS 48 INCHES. MANHOLE SHALL MEET ASTM C-478 REQUIREMENTS.
2) FLOWLINE ELEVATION OF INCOMING PIPES SHALL BE 1 INCH HIGHER THAN THAT OF OUTGOING PIPE.
3) PIPE SIZES LARGER THAN 24 INCH DIAMETER MAY REQUIRE MANHOLE DIAMETERS OF 60 INCH, 72 INCH OR 96 INCH AS DETERMINED BY OUTSIDE DIAMETERS AND ORIENTATIONS OF CONNECTING PIPES.
4) ECCENTRIC CONES SHALL BE USED ON DIAMETERS 60 INCH AND LARGER. STEPS SHALL EXTEND DOWN VERTICAL WALL OF CONE.
5) PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED TO THE AMEREN FOR APPROVAL OF MANHOLES ON PIPE DIAMETERS LARGER THAN 24 INCH AND ALSO FOR THOSE STRUCTURES WITH A DROP PIPE CONNECTION.

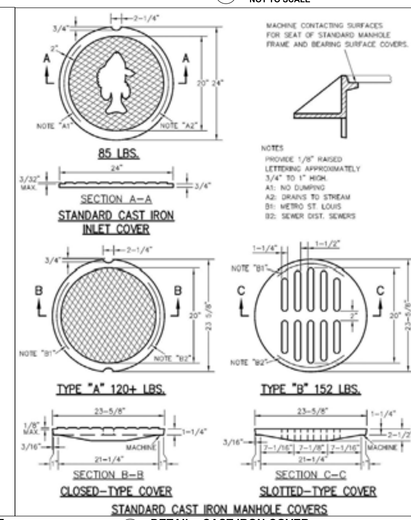
1 / - **DETAIL - PRECAST CONCRETE MANHOLE**
NOT TO SCALE



2 / - **DETAIL - MANHOLES STEP**
NOT TO SCALE

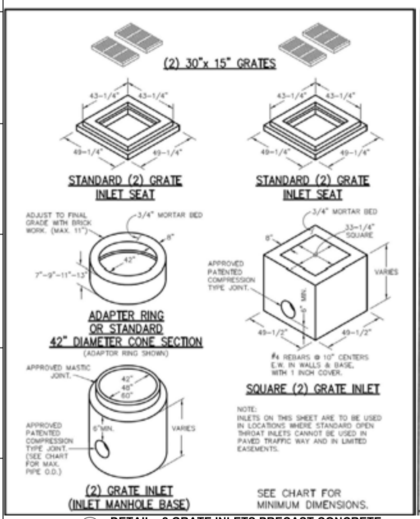


3 / - **DETAIL - CAST IRON MANHOLE FRAME**
NOT TO SCALE

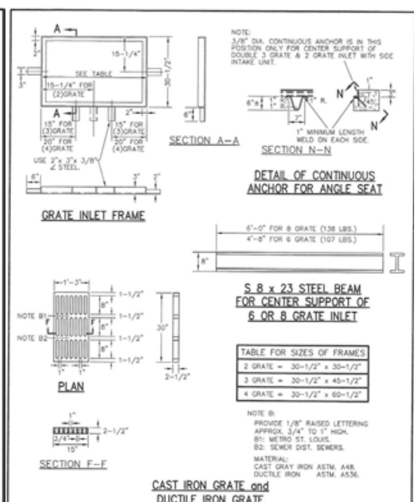


4 / - **DETAIL - CAST IRON COVER**
NOT TO SCALE

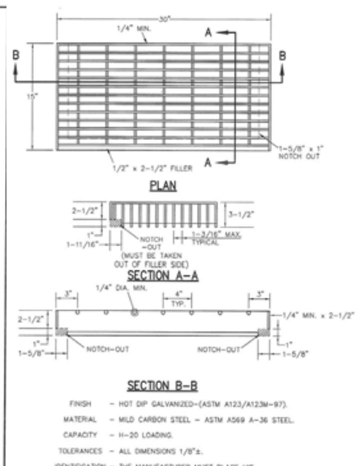
DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040



8 / - **DETAIL - 2 GRATE INLETS PRECAST CONCRETE**
NOT TO SCALE



9 / - **DETAIL - INLET FRAME AND GRATES**
NOT TO SCALE



10 / - **DETAIL - STEEL GRATE**
NOT TO SCALE

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314.993.4132
Missouri Professional Engineering Corporation
License No. 000215

PARTIALLY SUPERSEDED ---------------- REV---- DATE --/--/----

CONSTRUCTION

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NOTICE OF LIMITED RESPONSIBILITY
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SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM DETAILS - PIPE

SUPERSEDES ---------------- REV---- DATE --/--/----

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING: DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO.
MR-DWG-PROP-000011-022
REVISION NO. 1

SHEET NO.	TOTAL SHEETS

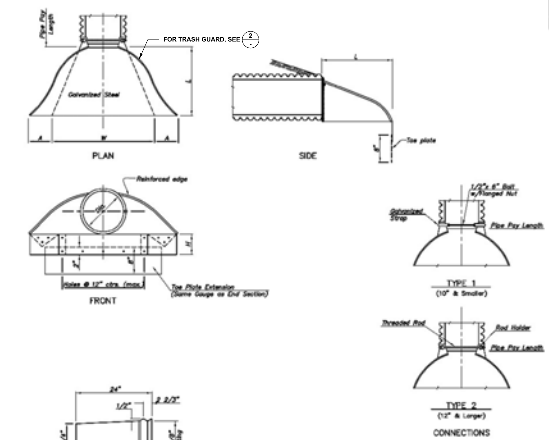
END SECTIONS FOR HDPE PIPE

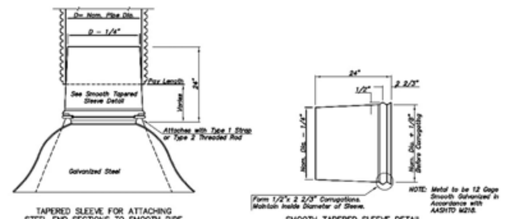
Dia.	Gauge	Weight	* A	* H	* L	* W	Slope	Overall Width
6"	18	10	4	3	8	12	2	20"
8"	18	14	5 3/4	4	14 1/2	16	2 1/4	27 1/2"
10"	18	17	7 5/8	6	14 1/2	20	2 1/2	35 1/4"
12"	16	25	7	6	21	24	2 1/2	38"
15"	16	33	8	6	26	30	2 1/2	46"
18"	16	42	8	6	31	36	2 1/2	52"
21"	16	49	9	6	36	42	2 1/2	60"
24"	16	65	10	6	41	48	2 1/2	68"
30"	14	123	12	8	51	60	2 1/2	84"
36"	14	135	14	9	60	72	2 1/2	100"
42"	12	320	16	11	69	84	2 1/2	116"
48"	12	375	18	12	78	90	2 1/4	126"
54"	12	440	18	12	84	102	2 1/4	138"
60"	12/10	610	18	12	87	114	2	150"

Toe plate extensions where specified, to be punched to match holes in apron lip. 3/8" bolts to be furnished. The length of toe plate to be as follows: W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 60" diameter pipes inclusive.

Multiple panel and sections shall have lap seams which are to be tightly jointed by bolts. Corner plate, and toe plate to be same gauge as end section.

* – Dimensions in Inches Plus or Minus Standard Shop Tolerance.



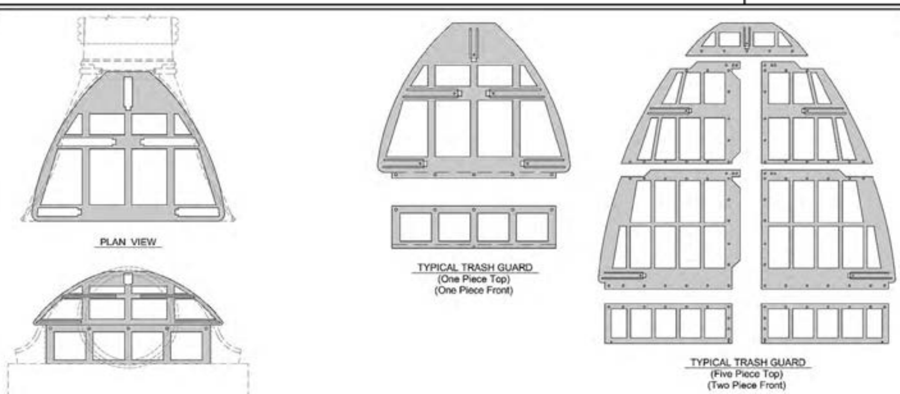


TAPERED SLEEVE FOR ATTACHING STEEL END SECTIONS TO SMOOTH PIPE

SMOOTH TAPERED SLEEVE DETAIL

No.	Date	Revisions

1 STANDARD END SECTION FOR HDPE PIPES



TRASH GUARDS FOR ROUND PIPE (HDPE)

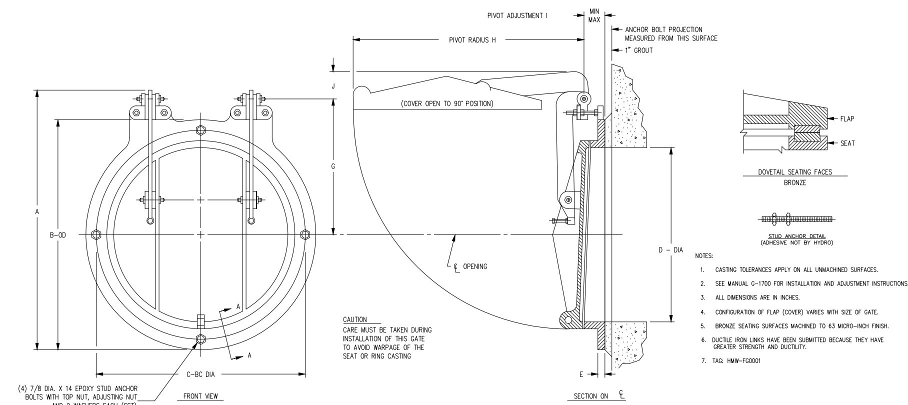
Pipe Size Dia.	Pieces	Bolts & Nuts	Screws	TOP Openings * Sq. Ft.	FRONT Openings * Sq. Ft.	TOTAL OPENINGS * Sq. Ft.
6"	1	0	3	0.19	0.14	0.33
8"	1	0	4	0.55	0.25	0.80
10"	1	0	4	0.82	0.42	1.24
12"	2	5	6	1.26	0.50	1.76
15"	2	5	6	2.15	0.73	2.88
18"	2	7	8	3.78	1.07	4.85
24"	2	7	8	6.14	1.85	7.99
30"	4	25	8	10.58	2.22	12.80
36"	7	51	8	15.67	3.17	18.84
42"	7	57	8	22.00	4.17	26.17
48"	7	59	8	28.71	5.00	33.71
60"	7	65	8	39.77	9.33	49.10

* - Openings calculated on Shop Drawings with no adjustments for Standard Shop Tolerances.

NO.	DATE	REVISION

2 TRASH GUARDS FOR HDPE END SECTIONS

J & J Drainage Products Co.



(4) 7/8 DIA. X 14 EPOXY STUD ANCHOR BOLTS WITH TOP NUT, ADJUSTING NUT AND 2 WASHERS EACH (SST). EMBED 10 (H4S14022L)

NOTES:

1. CASTING TOLERANCES APPLY ON ALL UNMACHINED SURFACES.
2. SEE MANUAL G-1700 FOR INSTALLATION AND ADJUSTMENT INSTRUCTIONS.
3. ALL DIMENSIONS ARE IN INCHES.
4. CONFIGURATION OF FLAP (COVER) VARIES WITH SIZE OF GATE.
5. BRONZE SEATING SURFACES MACHINED TO 63 MICRO-INCH FINISH.
6. DUCTILE IRON LINKS HAVE BEEN SUBMITTED BECAUSE THEY HAVE GREATER STRENGTH AND DUCTILITY.
7. TAG: HMW-FG0001

DIMENSIONAL DATA								I	
DIA	A	B	C	E	G	H	J	MAXIMUM	MINIMUM
24	35 1/8	32	29 1/2	7/8	18	31 1/4±	3 3/8±	2 5/8	1 3/8
36	50 1/4	46	42 3/4	1 1/8	26	45 5/8±	4 3/8±	3 3/8	2

EMBEDMENTS	MATERIAL DESCRIPTION	CODE	ASTM SPECIFICATION
STUD ANCHOR BOLTS	STAINLESS STEEL	(L)	A276, TYPE 304
ANCHOR BOLT NUTS	STAINLESS STEEL	(L)	F594, ALLOY GROUP 1

GATE ASSEMBLY	MATERIAL DESCRIPTION	CODE	ASTM SPECIFICATION
SEAT AND COVER	CAST IRON	(A)	A126, CLASS B
SEATING FACES (SEAT)	SILICON BRONZE	(J)	B98, ALLOY 651
SEATING FACES (COVER)	SILICON BRONZE	(J)	B98, ALLOY 651
PIVOT LUGS	DUCTILE IRON	(X)	A536, GRADE 80-55-06
LINKS	DUCTILE IRON	(X)	A536, GRADE 80-55-06
BUSHINGS	BRONZE	(E)	B584, ALLOY 932
HINGE PINS	STAINLESS STEEL	(P)	A276,TYPE 316
FASTENERS	STAINLESS STEEL	(P)	F593 (BOLTS), ALLOY GROUP 2 (316) F594 (NUTS), ALLOY GROUP 2 (316)

CLEANING: BLAST CLEAN (PER STEEL STRUCTURES PAINTING COUNCIL)
NEAR WHITE BLAST GRADE SSPC-SP10

SUBMERSIBLE COATING: AMERON, AMERLOCK 400 HIGH SOLIDS EPOXY COLOR GR-2 MEDIUM GRAY
2 - 3 SHOP COATS FOR A TOTAL DRY FILM THICKNESS OF 12 MILS MIN.
FOR THE FOLLOWING COMPONENTS: ☒ GATE

HYDRO GATE

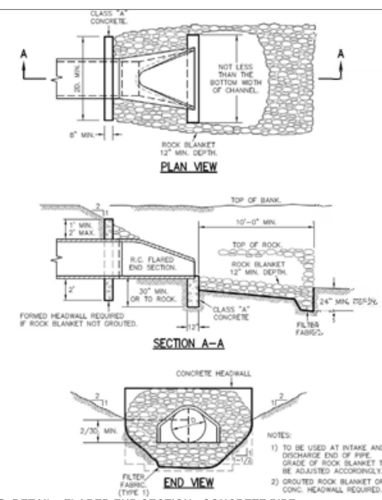
3 HEAVY DUTY FLAP GATE, SERIES 50C FLAT BACK SEAT, ADJ. UPPER PIVOT

QUANTITY: 1 MATERIAL: CAST IRON SCALE: NTS

THIS IS A PROPRIETARY DESIGN OF HYDRO GATE. THE DESIGN, DATA AND INFORMATION RELATING THERETO IS NOT TO BE USED, DISSEMINATED OR REPRODUCED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN CONSENT OF HYDRO GATE.

REV.	DATE	INITIALS			

DRAWN BY CDS	CUSTOMER NO.	SALES
CHECKED BY	DATE	DRAWING NO.



NOTES:
1) TO BE USED AT INTAKE AND DISCHARGE END OF PIPE. GRADE OF ROCK BLANKET TO BE ADJUSTED ACCORDINGLY.
2) GROUTED ROCK BLANKET OR CONC. HEADWALL REQUIRED.

4 DETAIL - FLARED END SECTION - CONCRETE PIPE
NOT TO SCALE

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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1055 Corporate Square Drive
St. Louis, Missouri 63132
314.993.4132
Missouri Professional Engineering Corporation
License No. 000215

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CONSTRUCTION

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SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM DETAILS - PIPE

SUPERSEDES ---------------- REV---- DATE --/--/----

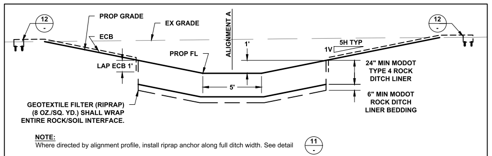
DRAWING RECORD							
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

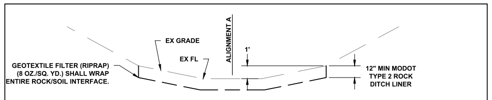
DRAWING NO.
MR-DWG-PROP-000011-023

REVISION NO. 1

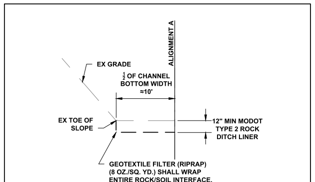


NOTE:
Where directed by alignment profile, install riprap anchor along full ditch width. See detail 11

1 **TYPICAL SECTION - PIPE OUTFALL DITCH IN CUT**
SCALE: 1"=5'

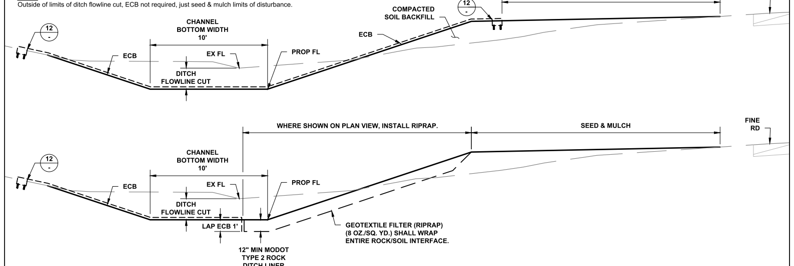


2 **TYPICAL SECTION - PIPE OUTFALL DITCH ON EXISTING GRADE**
SCALE: 1"=5'

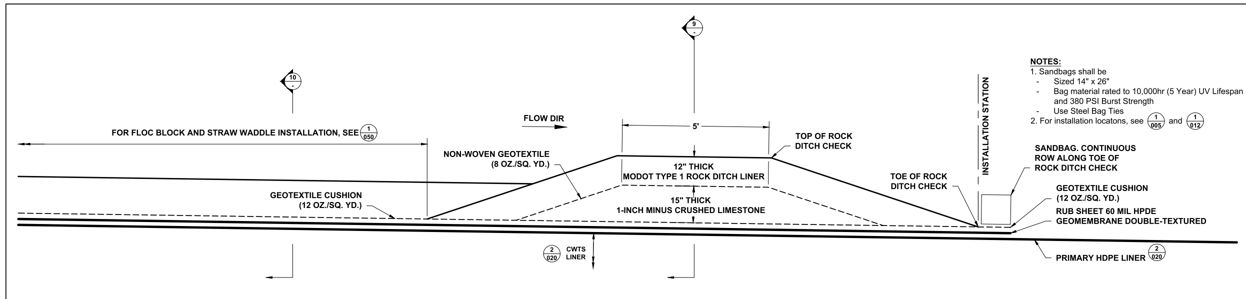


3 **TYPICAL SECTION - ROCK APRON AT PIPE OUTFALL**
SCALE: 1"=5'

NOTE:
Outside of limits of ditch flowline cut, ECB not required, just seed & mulch limits of disturbance.

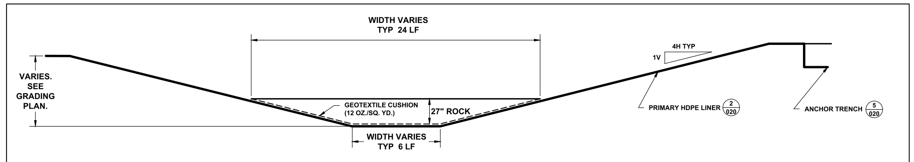


4 **TYPICAL SECTION - DITCH SLOPE ALONG ALIGNMENT G**
SCALE: 1"=5'



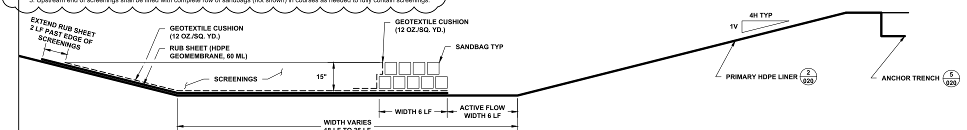
NOTES:
1. Sandbags shall be
- Sized 14" x 26"
- Bag material rated to 10,000hr (5 Year) UV Lifespan and 380 PSI Burst Strength
- Use Steel Bag Ties
2. For installation locatons, see 1/005 and 1/012

8 **TYPICAL SECTION - ROCK DITCH CHECK**
SCALE: 1"=2'

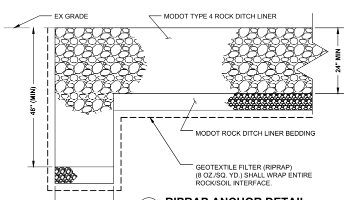


9 **TYPICAL SECTION - ROCK DITCH CHECK**
SCALE: 1"=5'

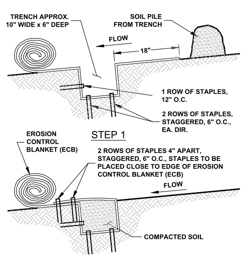
NOTES:
1. Detail applies to STA 6+35 F thru 6+75 F
2. Sandbags shall be:
- Sized 14" x 26"
- Bag material rated to 10,000hr (5 Year) UV Lifespan and 380 PSI Burst Strength
- Use Steel Bag Ties
3. Upstream end of screenings shall be lined with complete row of sandbags (not shown) in courses as needed to fully contain screenings.



10 **TYPICAL SECTION - DITCH NARROWING**
NOT TO SCALE



11 **RIPRAP ANCHOR DETAIL**
SCALE: 1"=1'



12 **CHANNEL TRENCHING METHOD**
NO SCALE

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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CONSTRUCTION
MARK UP DRAWING NO. | REV.

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM DETAILS - DITCH

SUPERSEDES ---------------- REV.---- DATE --/--/----

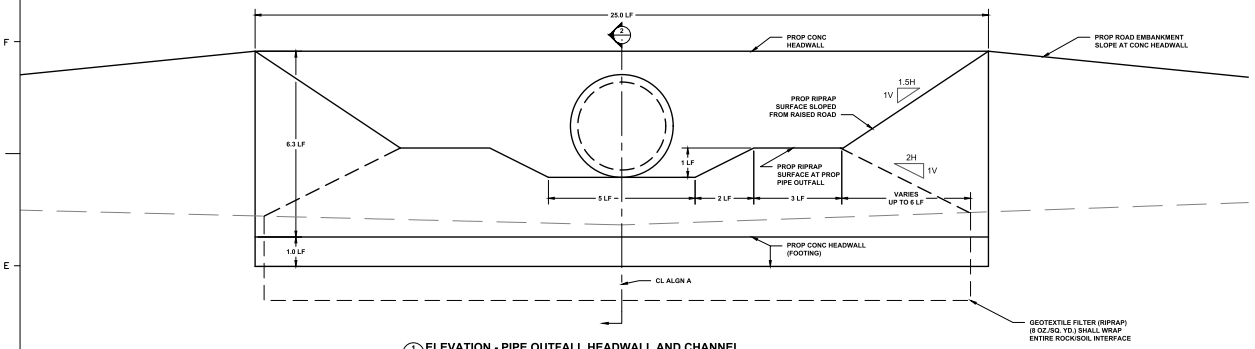
DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

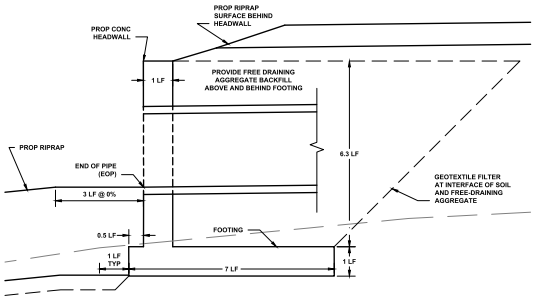
SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

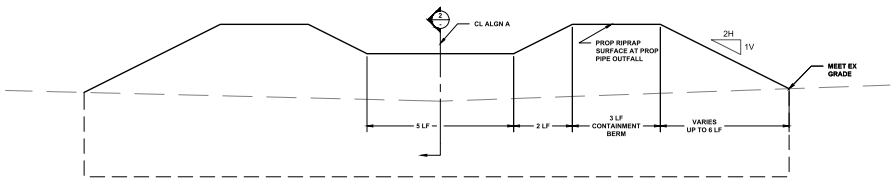
DRAWING NO.
MR-DWG-PROP-000011-024
REVISION NO. 1



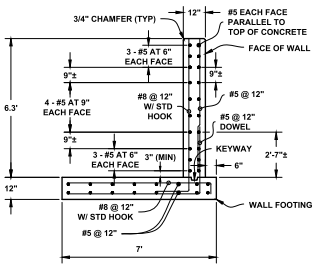
1 ELEVATION - PIPE OUTFALL HEADWALL AND CHANNEL
SCALE: 1" = 2'



2 TYPICAL SECTION - PIPE OUTFALL HEADWALL AND CHANNEL
SCALE: 1" = 2'

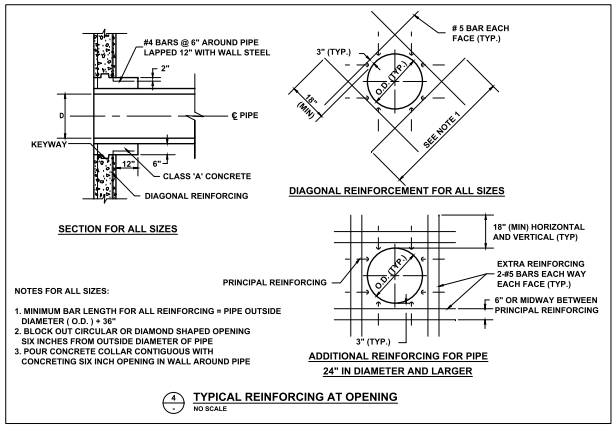


5 TYPICAL SECTION - RIPRAP OUTFALL
SCALE: 1" = 2'



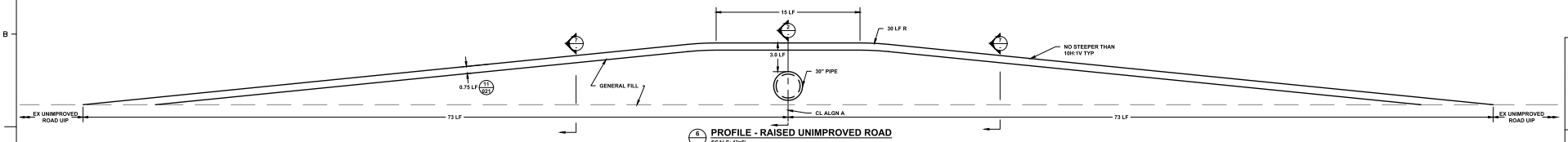
3 SECTION THROUGH NEW WALL
NO SCALE

GENERAL NOTES
1. ALL CONCRETE TO BE CLASS "A". F'C=3500 PSI (MIN)
2. ALL REINFORCING STEEL TO CONFORM TO ASTM A 615 GRADE 60.
3. ALL REINFORCING STEEL TO HAVE 3" COVER UNLESS OTHERWISE NOTED. TRIM BARS AT PIPE AND TOP OF WALL, AS REQUIRED.
4. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS & BAR LISTS FOR APPROVAL PRIOR TO START OF CONSTRUCTION.
5. SPLICES SHALL BE LOCATED AWAY FROM PIPE OPENINGS, IF POSSIBLE. LAP #5 BARS 33" MIN AND #8 BARS 66" MIN.
6. FIELD VERIFY ADEQUATE BEARING CAPACITY IS PROVIDED.

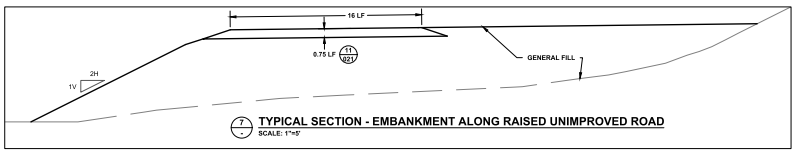


NOTES FOR ALL SIZES:
1. MINIMUM BAR LENGTH FOR ALL REINFORCING = PIPE OUTSIDE DIAMETER (O.D.) + 36"
2. BLOCK OUT CIRCULAR OR DIAMOND SHAPED OPENING SIX INCHES FROM OUTSIDE DIAMETER OF PIPE
3. POUR CONCRETE COLLAR CONTIGUOUS WITH CONCRETING SIX INCH OPENING IN WALL AROUND PIPE

4 TYPICAL REINFORCING AT OPENING
NO SCALE



6 PROFILE - RAISED UNIMPROVED ROAD
SCALE: 1"=5'



7 TYPICAL SECTION - EMBANKMENT ALONG RAISED UNIMPROVED ROAD
SCALE: 1"=5'

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DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lb	jf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jf	phr	ejk	Issued For Construction

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CONSTRUCTION
MARK UP DRAWING NO. | REV.

SCALE	VARIES
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

CLOSURE WATER TREATMENT SYSTEM DETAILS - PIPE

SITE: MERAMEC ENERGY CENTER

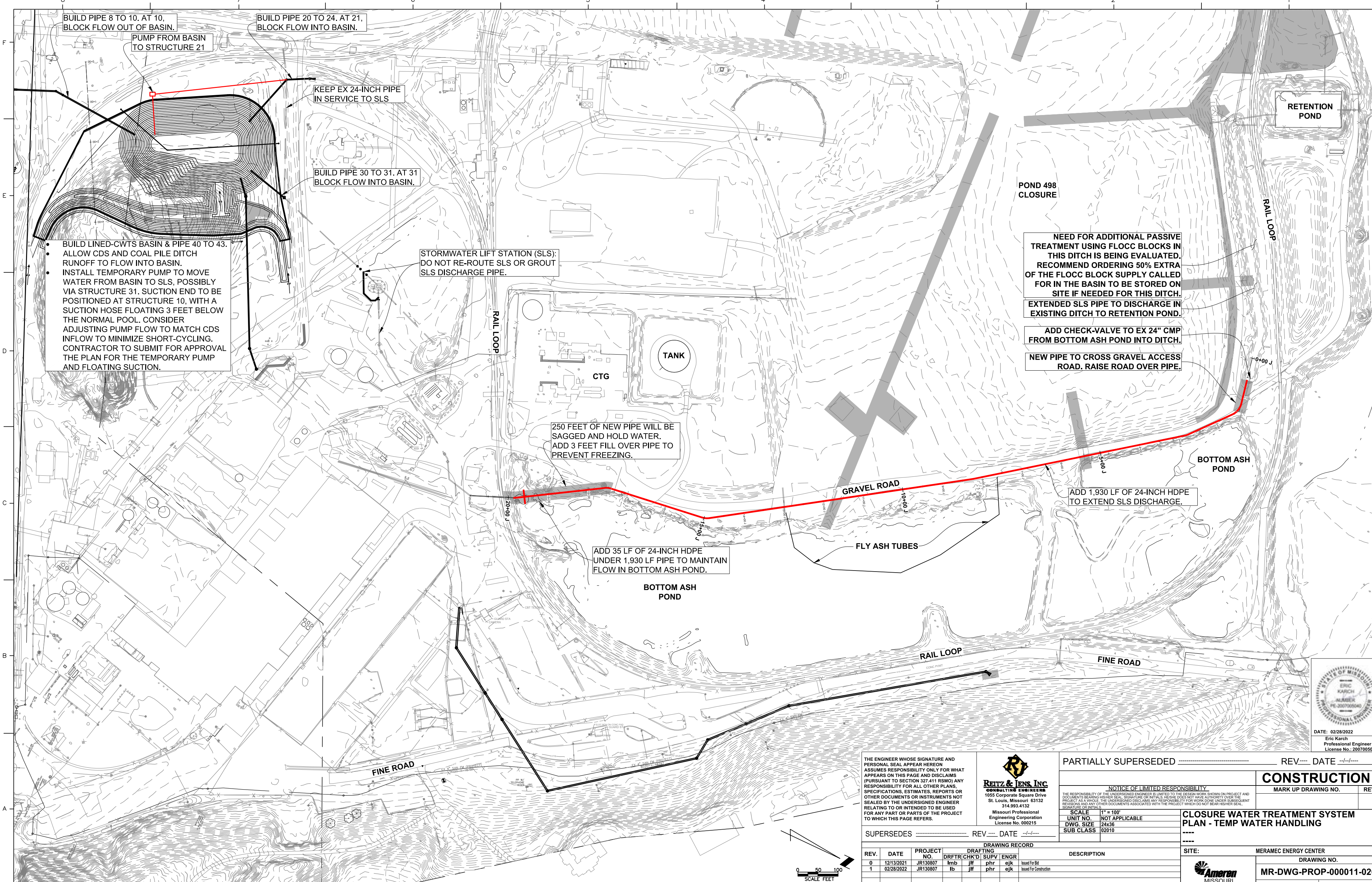
DRAWING NO.
MR-DWG-PROP-000011-025

REVISION NO. 1

MISSOURI

STATE OF MISSOURI
ERIC KARCH
NUMBER PE-2007005049
PROFESSIONAL ENGINEER

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005049



DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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MARK UP DRAWING NO.	REV.

SCALE	1" = 100'
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

SUPERSEDES ---------------------------- REV---- DATE --/--/----

CLOSURE WATER TREATMENT SYSTEM PLAN - TEMP WATER HANDLING

DRAWING RECORD

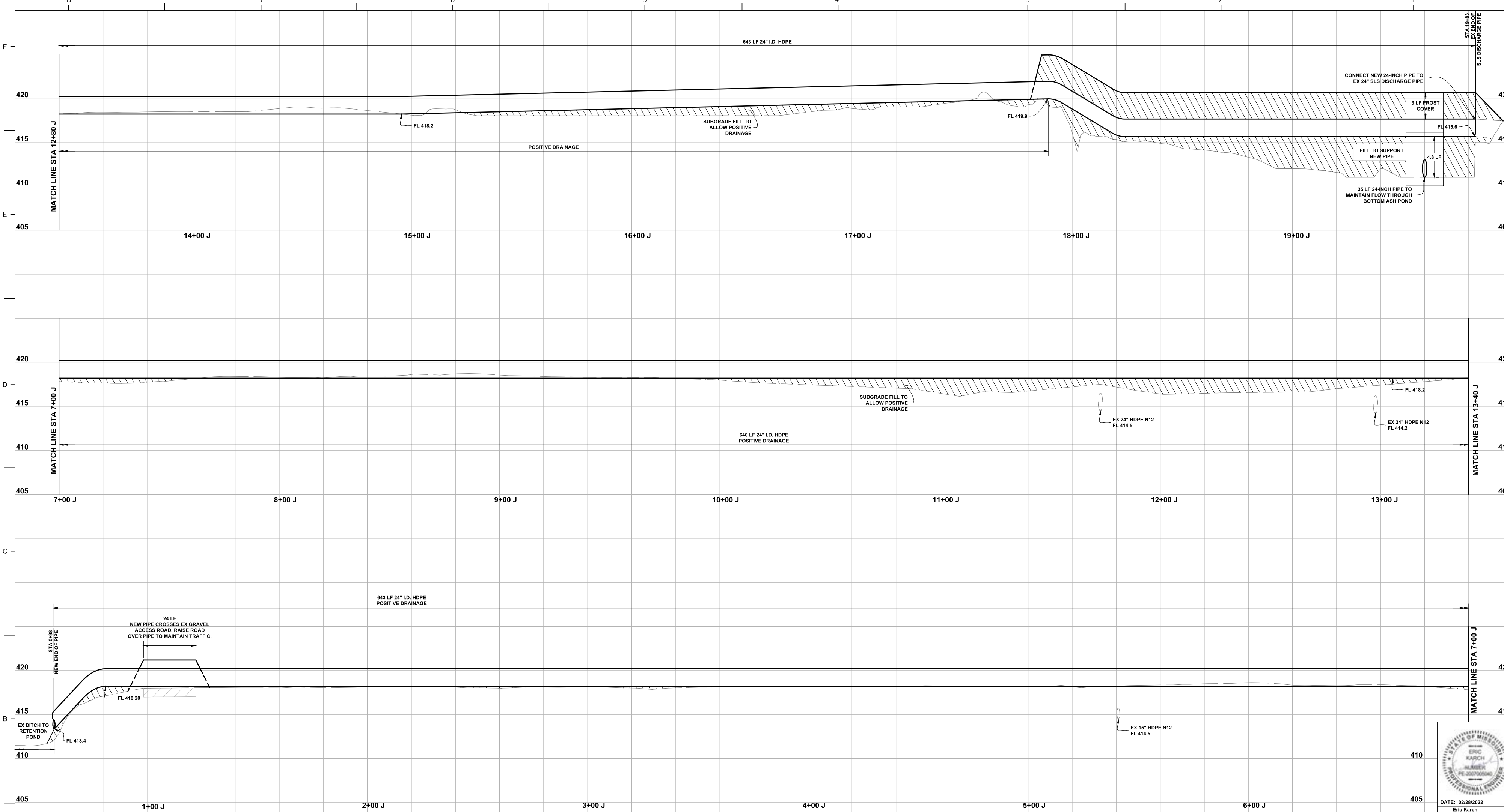
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued For Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PROP-000011-026

REVISION NO. 1



PROFILE - ALIGNMENT G

SCALE: 1" = 20'H
1" = 5'V

DATE: 02/28/2022
Eric Karch
Professional Engineer
License No.: 2007005040

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MARK UP DRAWING NO.	REV.

SCALE	1"=20' H 1"=5' V
UNIT NO.	NOT APPLICABLE
DWG. SIZE	24x36
SUB CLASS	02010

SUPERSEDES ---------------------------- REV---- DATE --/--/----

CLOSURE WATER TREATMENT SYSTEM
PROFILE - TEMP WATER HANDLING

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
0	12/13/2021	JR130807	lmb	jlf	phr	ejk	Issued for Bid
1	02/28/2022	JR130807	lb	jlf	phr	ejk	Issued For Construction

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PROP-000011-027

REVISION NO. 1

SLIDE GATE VALVE

KNIFE GATE VALVE

NC

GATE VALVE

GATE VALVE NORMALLY CLOSED

NC

GATE VALVE LOCKED OPEN

LO

GATE VALVE LOCKED CLOSED

LC

GLOBE VALVE NORMALLY CLOSED

NC

GLOBE VALVE

CHECK VALVE

SWING CHECK VALVE

LO LC NC

BALL VALVE

NC

PLUG VALVE

3-WAY PLUG VALVE

NC

BUTTERFLY VALVE

STOP CHECK VALVE

PINCH VALVE

NEEDLE VALVE

DIAPHRAGM OPERATED VALVE

ANGLE VALVE

QUICK OPENING (LEVER OPERATED)

THREE-WAY VALVE

FOUR-WAY VALVE

YARWAY TANDEM BLOW-OFF

POST INDICATOR UGND

COMBINATION PLUG-CHECK

BACKFLOW PREVENTOR

PISTON OPERATED VALVE

SIGHT FLOW

MOTOR OPERATED VALVE

ORIFICE PLATE

FLOW NOZZLE

CLEAN OUT

CO

WELD CAP

SCREWED OR SOCKETWELD CAP

BLIND FLANGE

PRE-ACTION VALVE

3-WAYCONTROL VALVE

GLOBE VALVE W/ QUICK CONNECT BODY ASSEMBLY FITTING

AUTOMATIC DIAPHRAGM OPERATED VALVE W/ HANDJACK. HANDJACK USED TO SET FLOW RATE

EXHAUST TO ATMOSPHERE (OUTSIDE)

EXHAUST TO ATMOSPHERE (INSIDE)

FLOOR DRAIN

EQUIPMENT DRAIN

HUB DRAIN

VALVE END TYPES

FLANGED

SOCKET WELD

THREAD / UNSPECIFIED / GLUED / COMPRESSION

WELDED

ACTUATORS

BACKPRESSURE REGULATOR W/ EXTERNAL PRESSURE TAP

DIAPHRAGM ACTUATOR

A/S

DIAPHRAGM ACTUATOR WITH AIR SUPPLY

DIAPHRAGM SPRING

DIFFERENTIAL PRESSURE REDUCING REGULATOR

D

DIGITAL

E/H

ELECTRO/HYDRAULIC

FILTER/REGULATOR/ LUBRICATOR

HANDWHEEL/MANUAL ACTUATOR

M

MOTOR OPERATED

PISTON OPERATED

PNEUMATIC CONTROLLER

PRESSURE BALANCED DIAPHRAGM ACTUATOR

PRESSURE REDUCING REGULATOR

PRESSURE REDUCING REGULATOR WITH EXTERNAL TAP

PRESSURE REDUCING REGULATOR WITH INTEGRAL OUTLET

M

ROTARY MOTOR

S M

SOLENOID MANUAL RESET

A/S S

SOLENOID PNEUMATIC

S R

SOLENOID REMOTE RESET

SPRING

THROTTLING ACTUATOR

S

SOLENOID

4-WAY 3-WAY 2-WAY

SOLENOID VALVE

RELIEF VALVE

H H

HYDRAULIC OPERATED VALVE

EJ

EXPANSION JOINT

T

TRAP

FLOW SWITCH

TEMPORARY STRAINER

STRAINER

HYDRAULIC & AIR CYLINDER OPERATED GATE VALVE

HYDRAULIC & AIR CYLINDER OPERATED BUTTERFLY VALVE

PRESSURE BREAKDOWN VALVE

CYLINDER OPERATED CONTROL VALVE

CAM OPERATED VALVE

BREAKDOWN ORIFICE

DRESSER COUPLING

FLANGED CONNECTION

SPECTACLE VALVE (LINE BLIND FLANGE)

FLOW METER

CYLINDER OPERATED BALL VALVE

LIQUID FILTER

PLATE & FRAME FILTER

VACUUM FILTER

CR CT

SPECIFIC CONDUCTIVITY TEST CELL

CR R

RESIN COLUMN

S CLG

COOLER

S PRC

PRESSURE REDUCING CAPILLARY

S TH

THERMOMETER

CR CA

CATION CONDUCTIVITY CELL

COMBINATION INSTRUMENT OR DEVICE W/ 2 SERVICES OR FUNCTIONS

INSTRUMENT W / SINGLE SERVICE OR FUNCTION

TRANSMITTER

BOARD MOUNTED INSTRUMENT

LOCAL BOARD MOUNTED INSTRUMENTS

S

SAMPLE POINT

AR

ANALYZER RECORDER

C

CARTRIDGE

B

BAG

ROTAMETER

S PH

PH CELL

CR SC

SPECIFIC CONDUCTIVITY CELL

CE

CONDUCTIVITY ELEMENT

V

EDUCTOR

PLC

PROGRAMMABLE LOGIC CONTROLLER

DCS

DISTRIBUTED CONTROL SYSTEM

INJECTION QUILL

SG

SITE GLASS

BLEED RING

R

PILOT LIGHT

DRAIN

PULSATION DAMPENER

LINE TYPES

MAIN PROCESS FLOW MAJOR FLOW ARROW

SECONDARY FLOW SECONDARY FLOW ARROW

ELECTRIC SIGNAL

SOFTWARE SIGNAL

HYDRAULIC SIGNAL

CAPILLARY TUBE

PNEUMATIC SIGNAL

MECHANICAL LINK

WIRELESS LINK

WIRELESS SIGNAL

VENDOR PACKAGE

HEAT TRACED PIPE

SINGLE ELEMENT WELL

DOUBLE ELEMENT WELL

EXPANSION LOOP (HOSE ONLY)

TANK VENT TO ATMOSPHERE

ROOF VENT TO ATMOSPHERE

D.C.

DOUBLE CONTAINED

SP

SAMPLE PORT

TP XXX

TIE-IN POINT

AT DT ST RT

TRAPS
AT = AIR TRAP
DT = DRAIN TRAP
ST = STEAM TRAP (Shown)
RT = RESIN TRAP

EC7200-THICKNESS

INSULATION

INSULATION ABBREVIATIONS

IC -INSULATE AGAINST COLD
IH -INSULATE TO RETAIN HEAT
PP -PERSONNEL PROTECTION
IS - SAFETY INSULATION
AU - ACOUSTIC INSULATION
AS - ANTI-SWEAT INSULATION

PROCESS PIPING DEFINITION

LINE NUMBER & SEQUENCE
(SHORT HAND; SERVICE & SEQUENCE)
SERVICE & SEQUENCE (NOT USED IN SHORTHAND)
SIZE
MATERIAL OF CONSTRUCTION

XXXXX-XX-XX"-XXX

PROCESS FLOW

INSTRUMENTATION SYMBOLS

NORMALLY ACCESSIBLE TO OPERATOR *

FIELD MOUNTED	PRIMARY LOCATION	AUXILIARY LOCATION
DISCRETE INSTRUMENTATION	DISCRETE INSTRUMENTATION	DISCRETE INSTRUMENTATION
SHARED DISPLAY, SHARED CONTROL	SHARED DISPLAY, SHARED CONTROL	SHARED DISPLAY, SHARED CONTROL
COMPUTER FUNCTION	COMPUTER FUNCTION	COMPUTER FUNCTION
PROGRAMMABLE LOGIC CONTROL	PROGRAMMABLE LOGIC CONTROL	PROGRAMMABLE LOGIC CONTROL

FR 104 B

SERVICE VARIABLE & FUNCTION
INSTRUMENT No.
PEN OR POINT No FOR MULTIPOINT INSTRUMENT OR SUFFIX

* INACCESSIBLE OR BEHIND THE PANEL DEVICES OR FUNCTIONS DEPICTED BY USING SAME SYMBOLS BUT WITH DASHED HORIZONTAL BAR

IDENTIFICATION LETTERS

	FIRST-LETTER		SUCCEEDING-LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)	GLASS, VIEWING DEVICE	RATIO (FRACTION)	
G	USER'S CHOICE				
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME, RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, DAMPER LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR UNCLASSIFIED FINAL CONTROL ELEMENT	

NOTE(S)

1. SYMBOLS SHOWN ON THIS DRAWING ARE PER AMERICAN NATIONAL STANDARD INSTRUMENTATION SYMBOLS AND IDENTIFICATION (ANSI/ISA-S5.1-1984).
2. ALL SYMBOLS SHOWN MAY NOT BE INCORPORATED IN THIS PROJECT.

ISSUED FOR CONSTRUCTION

CONSTRUCTION

MARK UP DRAWING NO. REV.

NOTICE OF LIMITED RESPONSIBILITY

SCALE NTS
UNIT NO. COMMON PLANT
DWG. SIZE 24x36
SUB CLASS 05050

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
PIPING AND INSTRUMENTATION DIAGRAMS
SYMBOLS AND ABBREVIATIONS (1 OF 2)

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-040

REVISION NO. 001

STATE OF MISSOURI ERIC P. BLUMENSTEIN NUMBER PE-2017039796 PROFESSIONAL ENGINEER

EQUIPMENT

MIXERS

- IN-LINE MIXER
- BUBBLE DIFFUSER
- INLINE STATIC MIXER
- AGITATOR STYLES (BLADE, PADDLE)

MOTORS

- ELECTRIC MOTOR W/O SHAFT
- ELECTRIC MOTOR W/SHAFT
- ELECTRIC MOTOR ACUTATOR
- DIESEL ENGINE

MATERIAL HANDLING

- CONVEYOR BELT
- SCREW CONVEYOR
- SCREW FEEDER
- ROLL OFF BOX
- BOX TOTE
- ROTARY FEEDER
- CHEMICAL TOTE

EQUIPMENT

PUMPS

- CENTRIFUGAL PUMP
- CENTRIFUGAL SUMP PUMP
- DIAPHRAGM PUMP
- GEAR PUMP
- HORIZONTAL CENTRIFUGAL PUMP
- INLINE PUMP
- METERING PUMP
- ROTARY PUMP
- LIQUID RING VACUUM PUMP
- POSITIVE DISPLACEMENT PUMP
- PROGRESSIVE CAVITY PUMP
- SCREW PUMP
- SELF PRIMING PUMP
- SUBMERSIBLE VERTICAL TURBINE SUMP PUMP
- SUBMERSIBLE SUMP PUMP
- TRANSFER PUMP
- VERTICAL CAN PUMP
- VERTICAL TURBINE PUMP (FLOAT TYPE)

EQUIPMENT

STORAGE

- GENERAL VESSEL
- DOUBLE WALL TANK
- FLAT TOP CLOSED TANK
- CHEMICAL INJECTION TANK
- FLOATING ROOF TANK
- LIME STORAGE BIN
- DOMED ROOF TANK
- HORIZONTAL VESSEL
- CONE BOTTOM TANK W/BOTTOM OUTLET
- OPEN TOP TANK
- CONE ROOF TANK
- PRESSURE STORAGE VESSEL
- INTERNAL FLOATING ROOF TANK
- CONE TANK

PIPING SYMBOLS

- FLANGE
- LINE BLIND
- UNION
- ORIFICE UNION
- CONICAL SCREEN BETWEEN FLANGES
- FLAT SCREEN BETWEEN FLANGES
- BLIND FLANGE
- HOSE CONNECTION
- PIPE CAP - THREADED
- PIPE CAP - WELDED
- PLUG
- PIPE BREAK
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- SEAL WATER (S)
- SIMPLEX STRAINER
- DUPLEX STRAINER
- "Y" STRAINER
- "Y" STRAINER W/BLOWDOWN
- FLEXIBLE HOSE
- EXPANSION JOINT
- BACK PULSE COLUMN (BP)
- HORN
- PRESSURE INDICATORS (PG)
- TEMPERATURE INDICATOR
- RESET FOR LATCH-TYPE ACTUATOR (R)
- PANEL MOUNTED PATCHBOARD (C)
- PURGE OR FLUSHING DEVICE (P, PURGE)
- UNDEFINED INTERLOCK LOGIC (I)

MISCELLANEOUS SYMBOLS

- FROM — ON-OFF PAGE CONNECTOR. (PROCESS LINES)
- TO — ON-OFF PAGE CONNECTOR. (PROCESS LINES)
- TO — ON-OFF PAGE CONNECTOR (INSTRUMENT SIGNALS)
- LINE NUMBER TAG (EXAMPLE)
- VALVE NUMBER TAG (EXAMPLE)
- SPEC BREAK
- SEGMENT BREAK-ONE LINE
- RISE / RUN — SLOPE/GRAVITY FLOW
- MARK — GRADE
- TUBING ADAPTER
- FLUME
- DIAPHRAGM SEAL
- CALIBRATION COLUMN
- CAM-LOK CONNECTION
- LEVEL FLOAT
- VIBRATING FORK
- SAFETY SHOWER WITH EYEWASH
- UTILITY CONNECTOR
- MASS BALANCE TAG (X)
- NOTE REFERENCE (XX)
- N — NORTH ARROW

NOTES:

1. SYMBOLS SHOWN ON THIS DRAWING ARE PER AMERICAN NATIONAL STANDARD INSTRUMENTATION SYMBOLS AND IDENTIFICATION (ANSI/ISA-S5.1-1984).
2. ALL SYMBOLS SHOWN MAY NOT BE INCORPORATED IN THIS PROJECT.

ISSUED FOR CONSTRUCTION

STATE OF MISSOURI — ERIC P. BLUMENSTEIN — NUMBER PE-2017039796 — PROFESSIONAL ENGINEER

CONSTRUCTION

MARK UP DRAWING NO.	REV.

NOTICE OF LIMITED RESPONSIBILITY

THE RESPONSIBILITY OF THE UNDERSIGNED ENGINEER IS LIMITED TO THE DESIGN WORK SHOWN ON PROJECT AND DOCUMENTS BEARING HIS/HER SEAL, SIGNATURE OR INITIALS. HE/SHE DOES NOT HAVE AUTHORITY OVER THE PROJECT AS A WHOLE. THE UNDERSIGNED DISCLAIMS ANY RESPONSIBILITY FOR WORK DONE UNDER SUBSEQUENT REVISIONS AND ANY OTHER DOCUMENTS ASSOCIATED WITH THE PROJECT WHICH DO NOT BEAR HIS/HER SEAL, SIGNATURE OR INITIALS.

SCALE	NTS
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	05050

MERAMEC ENERGY CENTR
CLOSURE WATER TREATMENT SYSTEM
PIPING AND INSTRUMENTATION DIAGRAMS
SYMBOLS AND ABBREVIATIONS (2 OF 2)

DRAWING RECORD

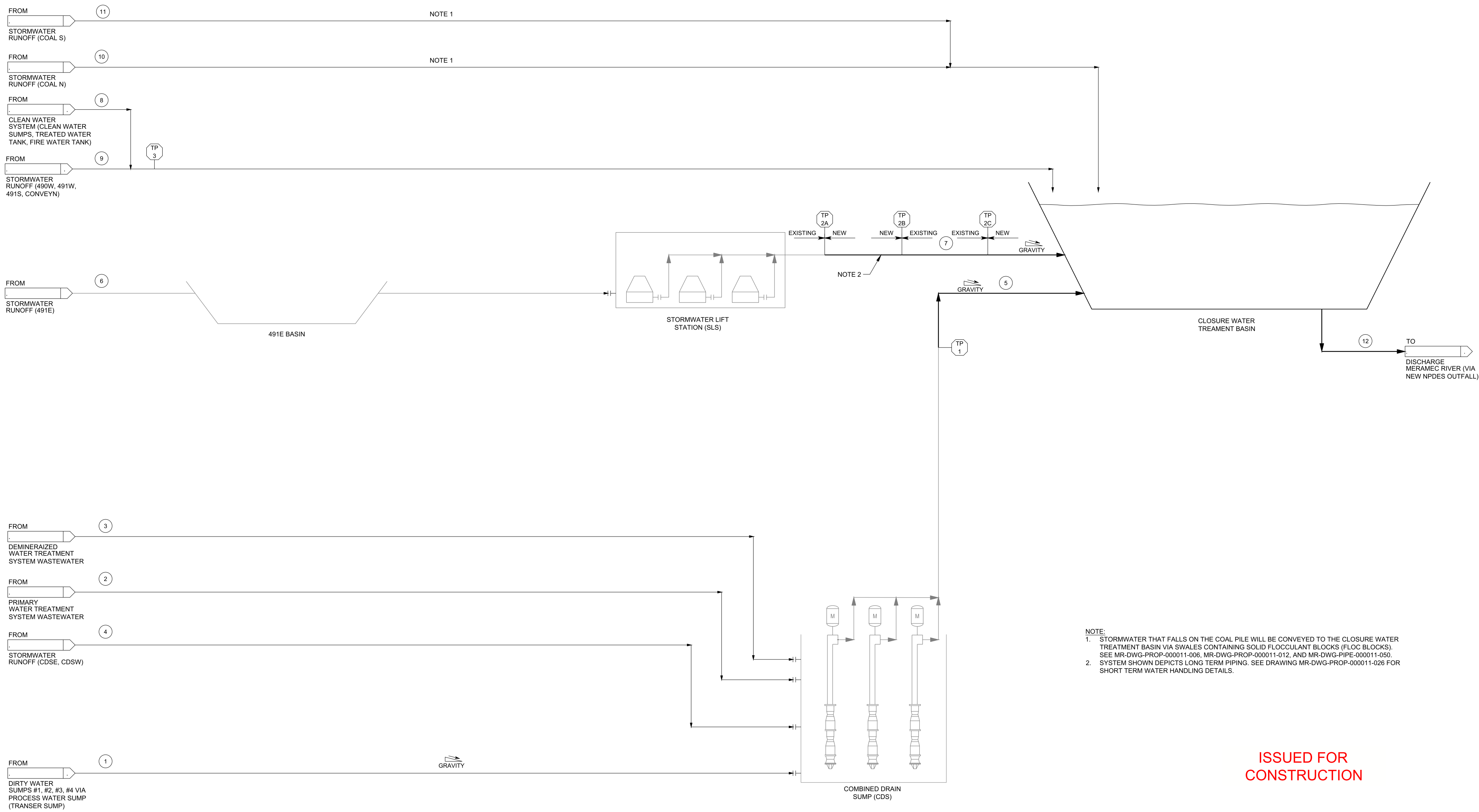
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21499574	JCS	PMP	EPB	ERB	ISSUED FOR BID
001	2022/02/28	21499574	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-041

REVISION NO. 001



NOTE:
1. STORMWATER THAT FALLS ON THE COAL PILE WILL BE CONVEYED TO THE CLOSURE WATER TREATMENT BASIN VIA SWALES CONTAINING SOLID FLOCCULANT BLOCKS (FLOC BLOCKS). SEE MR-DWG-PROP-000011-006, MR-DWG-PROP-000011-012, AND MR-DWG-PIPE-000011-050.
2. SYSTEM SHOWN DEPICTS LONG TERM PIPING. SEE DRAWING MR-DWG-PROP-000011-026 FOR SHORT TERM WATER HANDLING DETAILS.

ISSUED FOR CONSTRUCTION

CONSTRUCTION

MARK UP DRAWING NO.	REV.

NOTICE OF LIMITED RESPONSIBILITY

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SCALE	NTS
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
PROCESS FLOW DIAGRAM

SITE: MERAMEC ENERGY CENTER

Ameren MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-042

REVISION NO. 001

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

STATE OF MISSOURI ERIC P. BLUMENSTEIN NUMBER PE-2017039796 PROFESSIONAL ENGINEER

Mass Balance - Pre-Closure (2022)															
Line Number	1	2	3	4	5	6	7	8	9	10	11			12	
Parameter	Dirty Water Sumps (Combined)	Primary Water Treatment System Clarifier Blowdown	Demineralized Water Treatment System RO Reject	Stormwater to CDS (CDSE, CDSW)	Combined Drain Sump Effluent	Stormwater (491E)	Stormwater Lift Station Effluent	Clean Water System (Clean Water Sumps, Treated Water Tank, Fire Water Tank) a	Stormwater NW (490W, 491W, 491S, ConveyN)	Stormwater (CoalN)	Stormwater (CoalS)	Stormwater (Basin direct precipitation)	Closure Water Treatment Basin Influent	Closure Water Treatment Basin Effluent	Total Loading Rates (kg/day)
Flow Rate - Daily Average (gpm) b	726	35	78	-	726	-	-	-	-	-	-	-	726	726	-
Flow Rate - Maximum Treatment Design (gpm) c	5,000	155	750	7,181	2,680	1,346	2,560	-	583	135	718	583	7,259	7,259	-
Flow Rate - Maximum Hydraulic Design (gpm) d	10,000	155	750	21,993	5,330	8,079	6,980	-	3,905	2,693	8,977	5,835	33,720	15,485	-
Total Suspended Solids - Daily Average (mg/L) e	92	TBD	TBD	40	62	40	40	-	40	-	-	-	62	< 30	245
Total Suspended Solids - Maximum Treatment Design (mg/L) f	168	TBD	TBD	61	105	61	61	-	61	535	535	1	128	< 30	5,068
Total Suspended Solids - Maximum Hydraulic Design (mg/L) g	75	TBD	TBD	11	36	11	11	-	11	96	96	1	43	< 30	7,877

NOTES:
1) THE CONTRIBUTION OF THE CLEAN WATER SYSTEM IS ANTICIPATED TO BE A SINGLE FLUSH OF 452,000 GALLONS WITH A LOW TOTAL SUSPENDED SOLIDS CONCENTRATION AT SOME POINT BETWEEN 2022 AND 2024."
2) DAILY AVERAGE FLOW RATES ARE ANTICIPATED FLOW RATES AVERAGED OVER THE PERIOD OF ONE DAY. STORMWATER FLOW RATES ARE ASSUMED TO NOT OCCUR ON A DAILY BASIS.
3) THE MAXIMUM TREATMENT DESIGN FLOW RATE IS COMPOSED OF MODERATE OR MAXIMUM PROCESS WATER FLOW RATES AND THE 1-YEAR, 1-HOUR PEAK STORMWATER FLOW RATES (EXCLUDING THE 15 MINUTES AROUND THE PEAK FLOW RATE).
4) THE MAXIMUM HYDRAULIC DESIGN FLOW RATE IS COMPOSED OF MAXIMUM PROCESS WATER FLOW RATES AND THE 25-YEAR, 24-HOUR PEAK STORMWATER FLOW RATES (EXCLUDING THE 15 MINUTES AROUND THE PEAK FLOW RATE).
5) THE DAILY AVERAGE TOTAL SUSPENDED SOLIDS IS COMPOSED OF AVERAGE TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT PROCESS WATER LOCATIONS AND THE AVERAGE TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT THE STORMWATER LIFT STATION FOR STORMWATER STREAMS.
6) THE MAXIMUM TREATMENT DESIGN TOTAL SUSPENDED SOLIDS IS COMPOSED OF THE MAXIMUM TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT PROCESS WATER LOCATIONS (EXCLUDING OUTLIERS) AND THE MAXIMUM TOTAL SUSPENDED SOLIDS CONCENTRATION MEASURED AT THE STORMWATER LIFT STATION FOR STORMWATER STREAMS. THE DIRTY WATER SUMPS CONCENTRATION IS THE MAXIMUM OF THE AVERAGE VALUES CALCULATED FOR EACH DIRTY WATER SUMP. THE COMBINED DRAIN SUMP CONCENTRATION IS CALCULATED BASED ON UPSTREAM INPUTS.
7) THE MAXIMUM HYDRAULIC DESIGN TOTAL SUSPENDED SOLIDS IS COMPOSED OF THE MINIMUM TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT THE STORMWATER LIFT STATION FOR STORMWATER STREAMS. THE DIRTY WATER SUMPS CONCENTRATION IS THE MAXIMUM OF THE MINIMUM VALUES MEASURED AT EACH DIRTY WATER SUMP. THE COMBINED DRAIN SUMP CONCENTRATION IS CALCULATED BASED ON UPSTREAM INPUTS.

Mass Balance - Initial Closure (2023-2024)															
Line Number	1	2	3	4	5	6	7	8	9	10	11			12	
Parameter	Dirty Water Sumps (Combined)	Primary Water Treatment System Clarifier Blowdown	Demineralized Water Treatment System RO Reject	Stormwater to CDS (CDSE, CDSW)	Combined Drain Sump	Stormwater (491E)	Stormwater Lift Station Effluent	Clean Water System (Clean Water Sumps, Treated Water Tank, Fire Water Tank) a	Stormwater NW (490W, 491W, 491S, ConveyN)	Stormwater (CoalN)	Stormwater (CoalS)	Stormwater (Basin direct precipitation)	Closure Water Treatment Basin Influent	Closure Water Treatment Basin Effluent	Loading Rates
Flow Rate - Daily Average (gpm) b	726	-	-	-	726	-	-	-	-	-	-	-	726	726	-
Flow Rate - Maximum Treatment Design (gpm) c	5,000	-	-	7,181	2,680	1,346	2,560	-	494	1,257	4,578	3,366	14,935	14,935	-
Flow Rate - Maximum Hydraulic Design (gpm) d	10,000	-	-	21,993	5,330	8,079	6,980	-	3,501	4,488	14,363	8,752	43,414	17,953	-
Total Suspended Solids - Daily Average (mg/L) e	92	-	-	40	62	40	40	-	40	-	-	-	62	< 30	245
Total Suspended Solids - Maximum Treatment Design (mg/L) f	168	-	-	61	105	61	61	-	61	61	61	1	55	< 30	4,506
Total Suspended Solids - Maximum Hydraulic Design (mg/L) g	92	-	-	11	36	11	11	-	11	11	11	1	12	< 30	2,862

NOTES:
1) THE CONTRIBUTION OF THE CLEAN WATER SYSTEM IS ANTICIPATED TO BE A SINGLE FLUSH OF 452,000 GALLONS WITH A LOW TOTAL SUSPENDED SOLIDS CONCENTRATION AT SOME POINT BETWEEN 2022 AND 2024."
2) DAILY AVERAGE FLOW RATES ARE ANTICIPATED FLOW RATES AVERAGED OVER THE PERIOD OF ONE DAY. STORMWATER FLOW RATES ARE ASSUMED TO NOT OCCUR ON A DAILY BASIS.
3 THE MAXIMUM TREATMENT DESIGN FLOW RATE IS COMPOSED OF MODERATE OR MAXIMUM PROCESS WATER FLOW RATES AND THE 1-YEAR, 1-HOUR PEAK STORMWATER FLOW RATES (EXCLUDING THE 15 MINUTES AROUND THE PEAK FLOW RATE).
4) THE MAXIMUM HYDRAULIC DESIGN FLOW RATE IS COMPOSED OF MAXIMUM PROCESS WATER FLOW RATES AND THE 25-YEAR, 24-HOUR PEAK STORMWATER FLOW RATES (EXCLUDING THE 15 MINUTES AROUND THE PEAK FLOW RATE).
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6) THE MAXIMUM TREATMENT DESIGN TOTAL SUSPENDED SOLIDS IS COMPOSED OF THE MAXIMUM TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT PROCESS WATER LOCATIONS (EXCLUDING OUTLIERS) AND THE MAXIMUM TOTAL SUSPENDED SOLIDS CONCENTRATION MEASURED AT THE STORMWATER LIFT STATION FOR STORMWATER STREAMS. THE DIRTY WATER SUMPS CONCENTRATION IS THE MAXIMUM OF THE AVERAGE VALUES CALCULATED FOR EACH DIRTY WATER SUMP. THE COMBINED DRAIN SUMP CONCENTRATION IS CALCULATED BASED ON UPSTREAM INPUTS.
7) THE MAXIMUM HYDRAULIC DESIGN TOTAL SUSPENDED SOLIDS IS COMPOSED OF THE MINIMUM TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT THE STORMWATER LIFT STATION FOR STORMWATER STREAMS. THE DIRTY WATER SUMPS CONCENTRATION IS THE MAXIMUM OF THE MINIMUM VALUES MEASURED AT EACH DIRTY WATER SUMP. THE COMBINED DRAIN SUMP CONCENTRATION IS CALCULATED BASED ON UPSTREAM INPUTS.

Mass Balance - Post-Closure (2025+)															
Line Number	1	2	3	4	5	6	7	8	9	10	11			12	
Parameter	Dirty Water Sumps (Combined)	Primary Water Treatment System Clarifier Blowdown	Demineralized Water Treatment System RO Reject	Stormwater to CDS (CDSE, CDSW)	Combined Drain Sump	Stormwater (491E)	Stormwater Lift Station Effluent	Clean Water System (Clean Water Sumps, Treated Water Tank, Fire Water Tank	Stormwater NW (490W, 491W, 491S, ConveyN)	Stormwater (CoalN)	Stormwater (CoalS)	Stormwater (Basin direct precipitation)	Closure Water Treatment Basin Influent	Closure Water Treatment Basin Effluent	Loading Rates
Flow Rate - Daily Average (gpm) a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flow Rate - Maximum Treatment Design (gpm) b	-	-	-	7,181	2,680	269	2,560	-	673	1,257	4,578	3,366	15,114	15,114	-
Flow Rate - Maximum Hydraulic Design (gpm) c	-	-	-	21,993	5,330	5,610	6,980	-	13,016	4,488	14,363	8,752	52,929	19,300	-
Total Suspended Solids - Daily Average (mg/L) d	-	-	-	-	-	-	-	-	-	-	-	-	-	< 30	-
Total Suspended Solids - Maximum Treatment Design (mg/L) e	-	-	-	61	61	61	61	-	61	61	61	1	48	< 30	3,925
Total Suspended Solids - Maximum Hydraulic Design (mg/L) f	-	-	-	11	11	11	11	-	11	11	11	1	9	< 30	2,697

NOTES:
1) DAILY AVERAGE FLOW RATES ARE ANTICIPATED FLOW RATES AVERAGED OVER THE PERIOD OF ONE DAY. STORMWATER FLOW RATES ARE ASSUMED TO NOT OCCUR ON A DAILY BASIS.
2) THE MAXIMUM TREATMENT DESIGN FLOW RATE IS COMPOSED OF MODERATE OR MAXIMUM PROCESS WATER FLOW RATES AND THE 1-YEAR, 1-HOUR PEAK STORMWATER FLOW RATES (EXCLUDING THE 15 MINUTES AROUND THE PEAK FLOW RATE).
3) THE MAXIMUM HYDRAULIC DESIGN FLOW RATE IS COMPOSED OF MAXIMUM PROCESS WATER FLOW RATES AND THE 25-YEAR, 24-HOUR PEAK STORMWATER FLOW RATES (EXCLUDING THE 15 MINUTES AROUND THE PEAK FLOW RATE).
4) THE DAILY AVERAGE TOTAL SUSPENDED SOLIDS IS COMPOSED OF AVERAGE TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT PROCESS WATER LOCATIONS AND THE AVERAGE TOTAL SUSPENDED SOLIDS CONCENTRATIONS MEASURED AT THE STORMWATER LIFT STATION FOR STORMWATER STREAMS.
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ISSUED FOR CONSTRUCTION

CONSTRUCTION

NOTICE OF LIMITED RESPONSIBILITY

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MARK UP DRAWING NO.	REV.

SCALE	NTS
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	05050

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
MASS BALANCE

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

SITE: MERAMEC CTG ENERGY CENTER

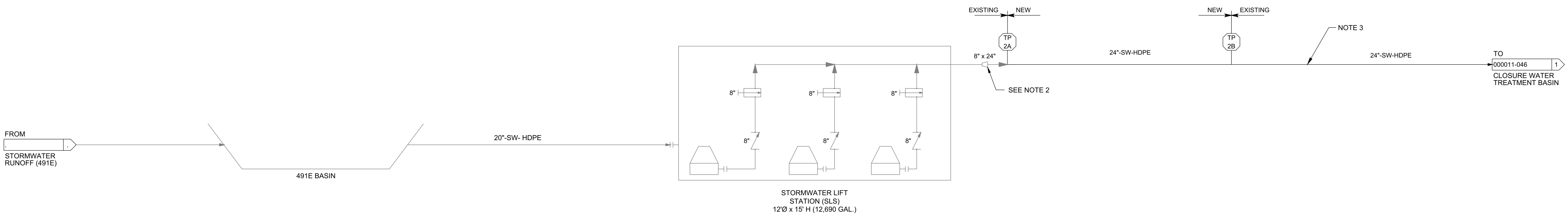
Ameren MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-043

REVISION NO. 001

NOTE(S)

1. CLEANOUTS AND/OR MANHOLES WILL BE LOCATED WITHIN THE NEW PIPING. SEE DRAWING MR-DWG-PROP-000011-006 FOR LOCATIONS.
2. EXACT LOCATION AND SIZE OF PIPE DIAMETER INCREASE IS UNKNOWN. NEW PIPE IS TO BE TIED INTO EXISTING 24" PIPE.
3. SYSTEM SHOWN IS REPRESENTATIVE OF LONG-TERM WATER HANDLING PLAN. SEE DRAWING MR-DWG-PROP-000011-026 FOR SHORT TERM WATER HANDLING DETAILS.



ISSUED FOR CONSTRUCTION

CONSTRUCTION	
MARK UP DRAWING NO.	REV.

NOTICE OF LIMITED RESPONSIBILITY

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SCALE	NTS
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	05050

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
PIPING AND INSTRUMENTATION DIAGRAM
STORMWATER LIFT STATION

SITE: MERAMEC ENERGY CENTER

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING: DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

Ameren MISSOURI

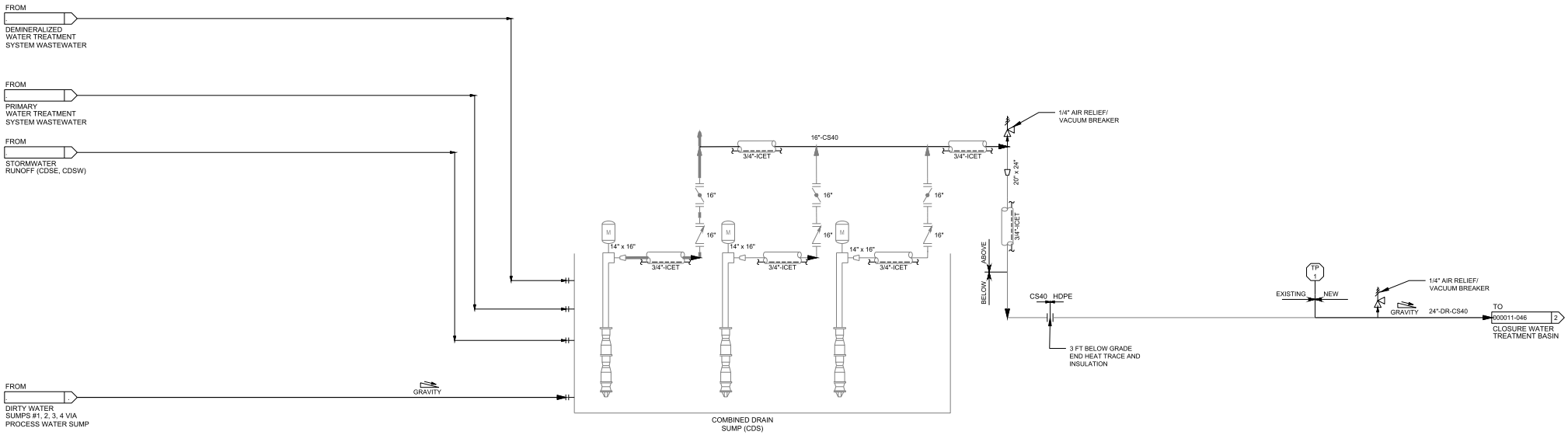
DRAWING NO. MR-DWG-PIPE-000011-044

REVISION NO. 001

STATE OF MISSOURI ERIC P. BLUMENSTEIN NUMBER PE-2017019796 PROFESSIONAL ENGINEER

NOTE(S)

1. CLEANOUTS AND/OR MANHOLES WILL BE LOCATED WITHIN THE NEW PIPING. SEE DRAWING MR-DWG-PROP-000011-004 FOR LOCATIONS.



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MARK UP DRAWING NO. | REV.

NOTICE OF LIMITED RESPONSIBILITY

THE RESPONSIBILITY OF THE ENGINEER OF RECORD IS LIMITED TO THE DESIGN WORK SHOWN ON PROJECT AND DOCUMENTS BEARING HIS/HER SEAL/SIGNATURE AND ALSO INCLUDE DOES NOT INVOLVE AUTHORITY OVER THE PROJECT AS A WHOLE. THE UNDERSIGNED DISCLAIMS ANY RESPONSIBILITY FOR WORK DONE UNDER SUBSEQUENT REVISIONS AND ANY OTHER DOCUMENTS ASSOCIATED WITH THE PROJECT WHICH DO NOT BEAR HIS/HER SEAL.

SCALE	NTS
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	05050

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
PIPING AND INSTRUMENTATION DIAGRAM
COMBINED DRAIN SUMP

SITE: MERAMEC ENERGY CENTER

MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-045

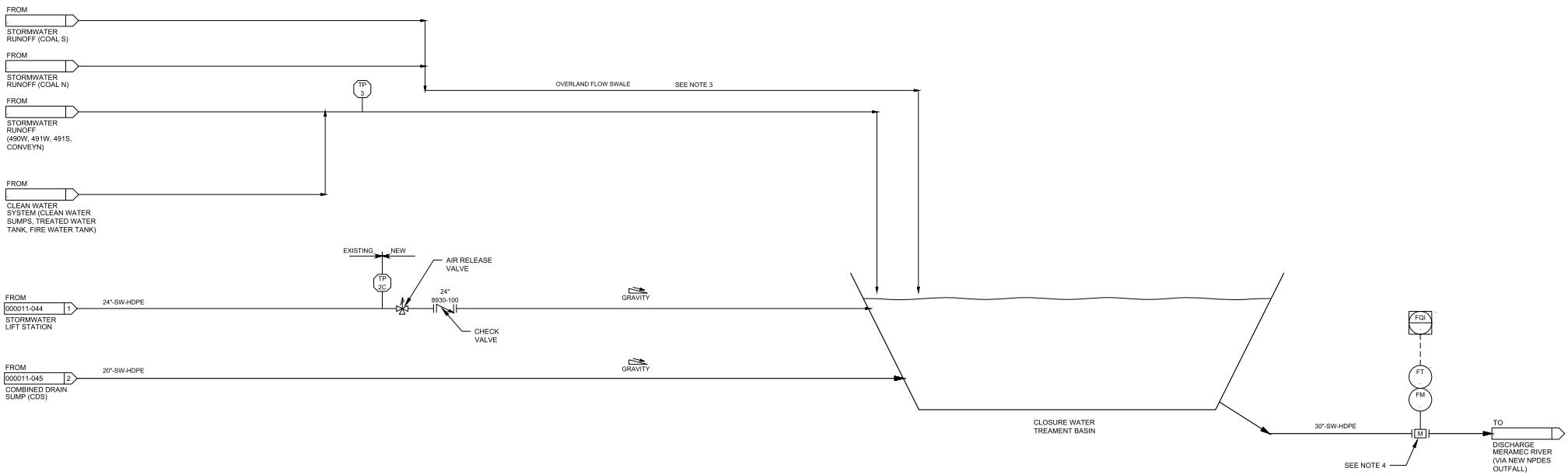
REVISION NO. 001

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
000	2022/01/10	21455974	JCS	PMP	EPB	EPB	BID ADDENDUM #01 - COMPLETE SHEET REVISION
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

NOTE(S)

1. CLEANOUTS AND/OR MANHOLES WILL BE LOCATED WITHIN THE NEW PIPING. SEE DRAWING MR-DWG-PROP-000011-004 FOR LOCATIONS.
2. THE FIRE WATER TANK INCLUDES DISCHARGE FROM THE UPSTREAM CLEAN WATER SUMPS (CWS) AND TREATED WATER TANK VIA THE TREATED WATER HEADER.
3. STORMWATER THAT FALLS ON THE COAL PILE WILL BE CONVEYED TO THE CLOSURE WATER TREATMENT BASIN VIA SWALES CONTAINING SOLID FLOCCULENT BLOCKS (FLOC BLOCKS). SEE MR-DWG-PROP-000011-006, MR-DWG-PROP-000011-012, AND MR-DWG-PIPE-000011-050.
4. SEE SPECIFICATION 15121 PRIMARY MEASUREMENT DEVICES FOR FLOW MONITORING INSTRUMENTATION REQUIREMENTS.



ISSUED FOR CONSTRUCTION

CONSTRUCTION

MARK UP DRAWING NO. | REV.

NOTICE OF LIMITED RESPONSIBILITY

THE RESPONSIBILITY OF THE ENGINEER(S) OR FIRM IS LIMITED TO THE DESIGN WORK SHOWN ON PROJECT AND DOCUMENTS BEARING HIS/HER SEAL/SIGNATURE AND IS NOT THAT OF THE OVERALL AUTHORITY OVER THE PROJECT AS A WHOLE. THE UNDERSIGNED DISCLAIMS ANY RESPONSIBILITY FOR WORK DONE UNDER SUBSEQUENT REVISIONS AND ANY OTHER DOCUMENTS ASSOCIATED WITH THE PROJECT WHICH DO NOT BEAR HIS/HER SEAL/SIGNATURE.

SCALE	NTS
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	0040

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
PIPING AND INSTRUMENTATION DIAGRAM
CLOSURE WATER TREATMENT BASIN

SITE: MERAMEC ENERGY CENTER

DRAWING NO.: MR-DWG-PIPE-000011-046

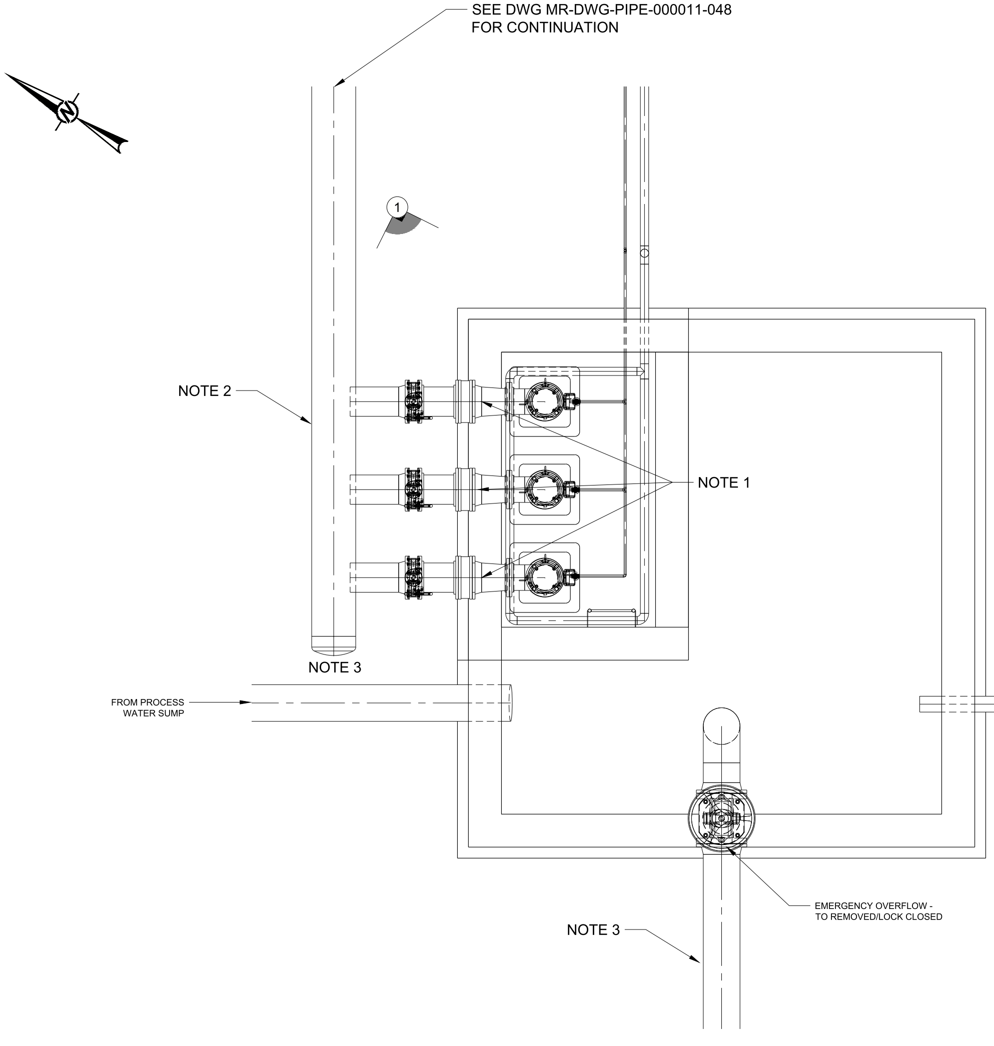
REVISION NO.: 001

DRAWING RECORD

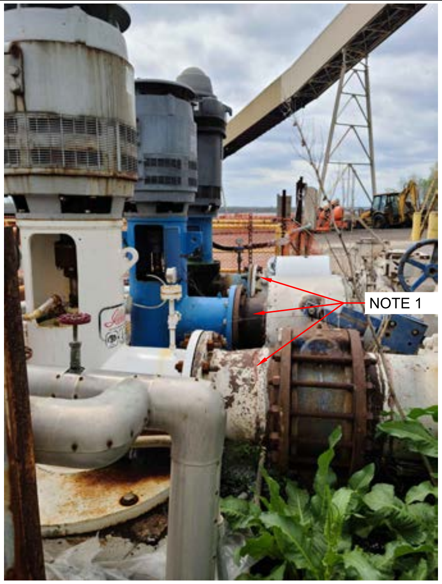
REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

STATE OF MISSOURI
ERIC P. BLUMENSTEIN
NUMBER PE-2013039796

MISSOURI



TOP VIEW
SCALE 3/8" = 1'-0"



CDS PUMPS DISCHARGE HEADER. PHOTO TAKEN LOOKING SOUTHEAST.
SCALE: NTS (1) THIS SHEET

ISSUED FOR CONSTRUCTION

NOTES:
1. ALL FITTINGS, VALVES, AND REDUCERS FROM EACH PUMP SHALL BE INSULATED AND HEAT TRACED FROM THE PUMP DISCHARGE TO THE 24" DISCHARGE HEADER.
2. 24" DISCHARGE LINE SHALL BE INSULATED AND HEAT TRACED FOR ANY PORTION OF PIPE ABOVE GROUND.
3. WELL DEFINED SOURCES TO THE CDS HAVE BEEN NOTED. OTHER SOURCES FLOW INTO THE CDS THAT ARE NOT DEPICTED IN THIS DRAWING.

STATE OF MISSOURI
ERIC P. BLUMENSTEIN
NUMBER PE-2017039796
PROFESSIONAL ENGINEER

NOTICE OF LIMITED RESPONSIBILITY
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CONSTRUCTION

MARK UP DRAWING NO.	REV.

SCALE	3/8"=1'-0"
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
COMBINED DRAIN SUMP
EQUIPMENT PLAN (1 OF 2)

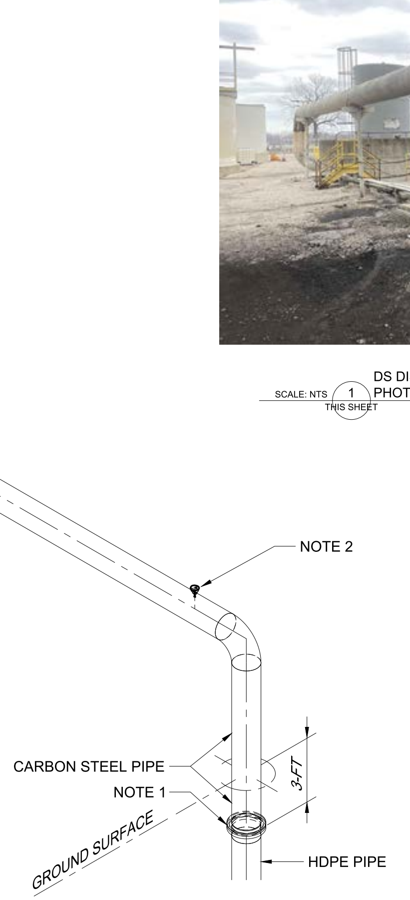
SITE: MERAMEC CTG ENERGY CENTER

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

Ameren MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-047
REVISION NO. 001



SCALE: NTS (1 THIS SHEET) DS DISCHARGE PIPELINE GOING UNDERGROUND.
PHOTO TAKEN LOOKING SOUTHWEST.

ISSUED FOR
CONSTRUCTION

NOTES:
1. INSULATION AND HEAT TRACE SHALL EXTEND 3-FT BELOW GROUND SURFACE. PIPE MATERIAL THRU THE INSULATION AND HEAT TRACE DEPTH 3-FT BELOW GROUND SURFACE SHALL BE CARBON STEEL. A MECHANICAL FLANGE MUST BE USED FOR THE TRANSITION FROM CARBON STEEL TO THE EXISTING HDPE PIPE BELOW GRADE.
2. COMBINATION AIR RELEASE/AIR VACUUM VALVE SHALL BE INSTALLED AT THE HIGH POINT OF THE 24" DISCHARGE LINE.

STATE OF MISSOURI — ERIC P. BLUMENSTEIN — NUMBER PE-2017039796 — PROFESSIONAL ENGINEER

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SCALE	3/8"
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	04020

CONSTRUCTION

MARK UP DRAWING NO.	REV.

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
COMBINED DRAIN SUMP
EQUIPMENT PLAN (2 OF 2)

SITE: MERAMEC CTG ENERGY CENTER

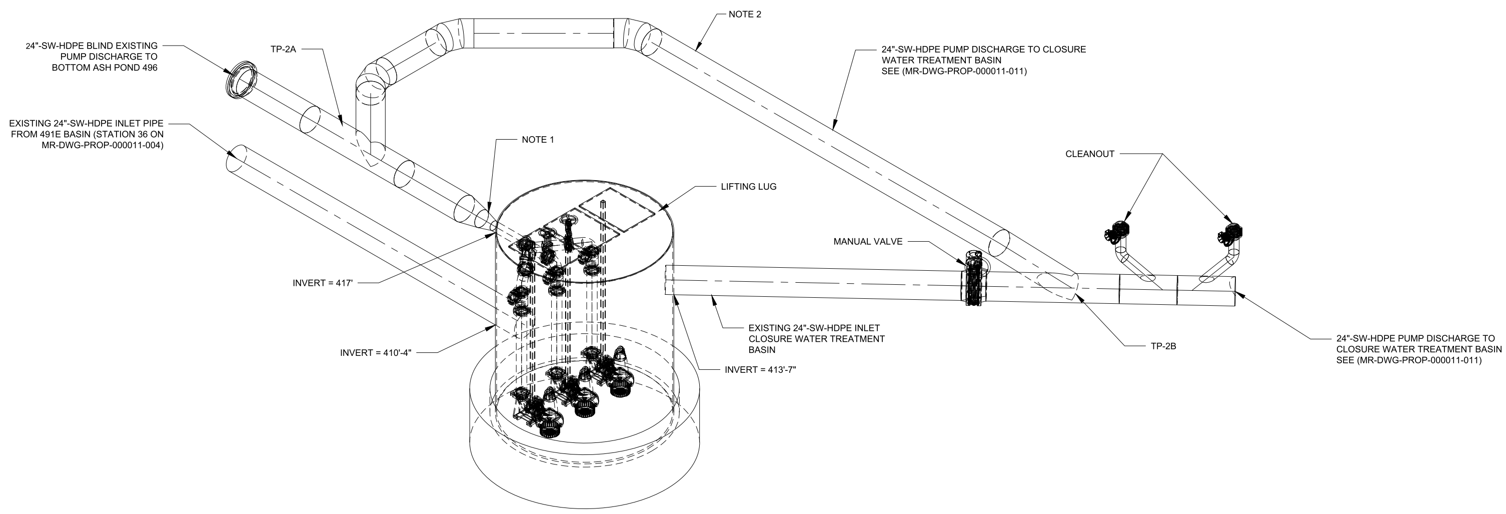
DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
000	2022/01/10	21455974	CRC	PMP	EPB	EPB	BID ADDENDUM #01 - COMPLETE SHEET REVISION
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

Ameren MISSOURI

DRAWING NO. MR-DWG-PIPE-000011-048

REVISION NO. 001



ISOMETRIC VIEW

SCALE 1/4" = 1'-0"

NOTES:

1. EXPANSION DETAILS FROM EXISTING 8" PUMP DISCHARGE TO EXISTING 24" BURIED PIPELINE ARE UNKNOWN. PIPING REROUTE WILL TIE INTO EXISTING 24" BURIED PIPELINE AFTER THE EXPANSION AT A LOCATION DETERMINED IN THE FIELD.
2. SYSTEM SHOWN DEPICTS LONG-TERM PIPING. SEE DRAWING MR-DWG-PROP-000011-026 FOR SHORT-TERM WATER HANDLING DETAILS.

ISSUED FOR CONSTRUCTION

CONSTRUCTION

MARK UP DRAWING NO.	REV.

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SCALE	
UNIT NO.	COMMON PLANT
DWG. SIZE	24x36
SUB CLASS	

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
STORMWATER LIFT STATION

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRFTR	CHK'D	SUPV	ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

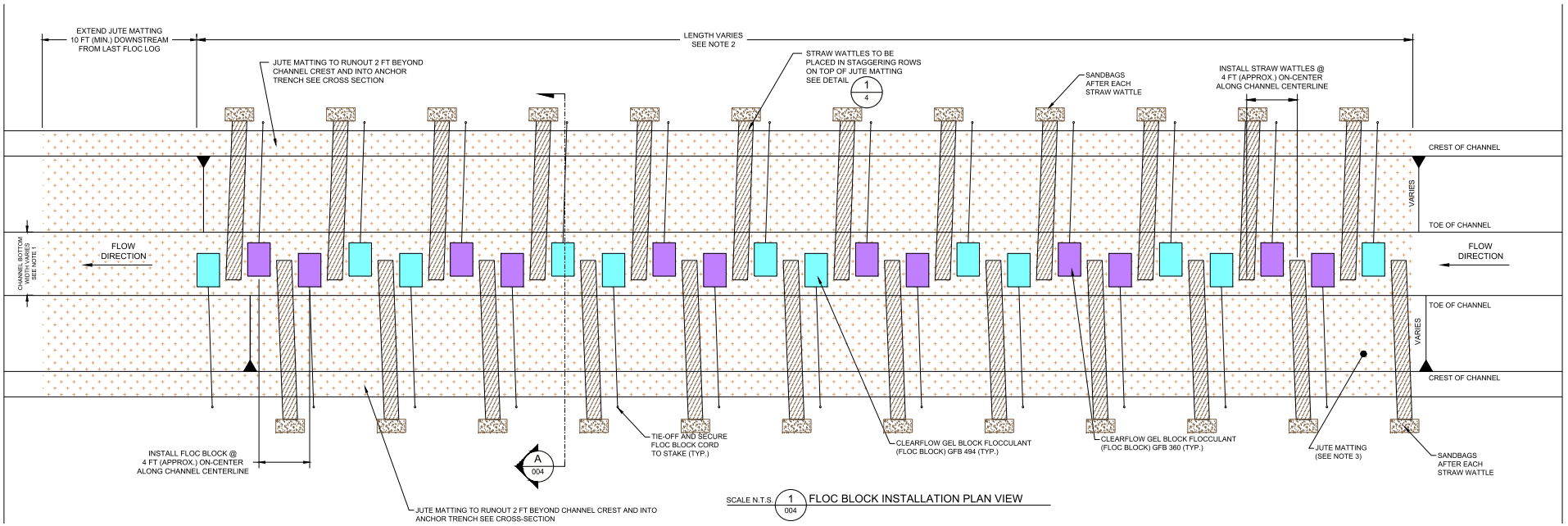
SITE: MERAMEC CTG ENERGY CENTER

Ameren MISSOURI

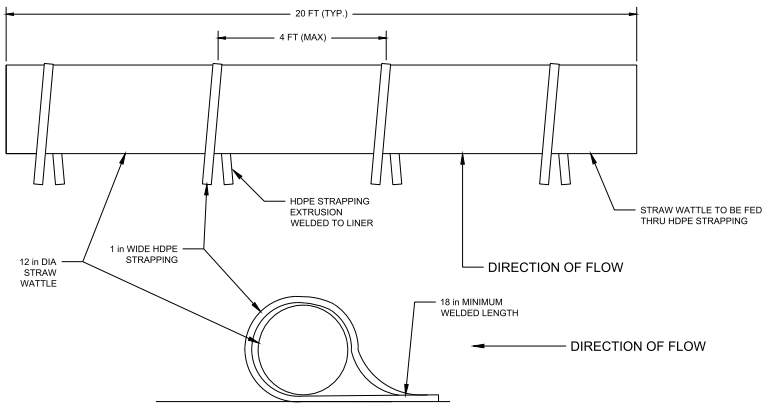
DRAWING NO. MR-DWG-PIPE-000011-049

REVISION NO. 001

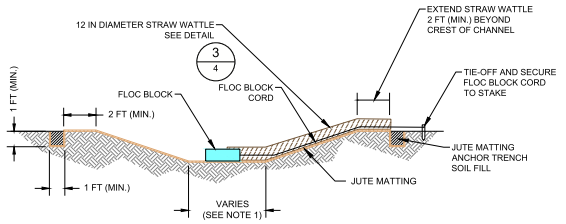
STATE OF MISSOURI ERIC P. BLUMENSTEIN NUMBER PE-2017039796 PROFESSIONAL ENGINEER



SCALE N.T.S. 1/004 FLOC BLOCK INSTALLATION PLAN VIEW



SCALE N.T.S. 1/050 TYPICAL STRAW WATTLE INSTALLATION DETAIL



CROSS-SECTION VIEW

SCALE N.T.S. A/050 FLOC BLOCK INSTALLATION CROSS-SECTION

NOTES:
1. CHANNEL BOTTOM WIDTH VARIES AND IS AT A MINIMUM 20-FT WIDE (SEE MR-DWG-PROP-000011-020). THE FLOC BLOCKS WILL BE PLACED ALONG THE CHANNEL CENTERLINE AND THE STRAW WATTLES WILL BE PLACED FROM THE CHANNEL CENTERLINE EXTENDING TO A MINIMUM OF 2 FT BEYOND THE CREST OF THE CHANNEL.
2. THE LENGTH OF THE FLOCK BLOC INSTALLATION VARIES BASED ON ANTICIPATED FLOW RATES AT DIFFERENT POINTS IN THE CHANNEL AND NUMBER OF FLOC BLOCKS TO BE INSTALLED (SEE MR-DWG-PROP-000011-004).

FLOC BLOCK SECTION	FLOC BLOCK COUNT	SECTION LENGTH	ALIGNMENT E SECTION START	ALIGNMENT E SECTION END
NORTH COAL DITCH	8	32	7+32 E	7+00 E
SOUTH COAL DITCH UPSTREAM	22	88	3+60 E	2+72 E
SOUTH COAL DITCH DOWNSTREAM	7	28	5+00 E	4+72 E

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SCALE	
UNIT NO.	
DWG. SIZE	24x36
SUB CLASS	0050

MERAMEC ENERGY CENTER
CLOSURE WATER TREATMENT SYSTEM
FLOC BLOCK DETAILS

SITE: MERAMEC CTG ENERGY CENTER

DRAWING NO.: MR-DWG-PIPE-000011-050

REVISION NO.: 001

DRAWING RECORD

REV.	DATE	PROJECT NO.	DRAFTING DRFTR	DRAFTING CHK'D	DRAFTING SUPV	DRAFTING ENGR	DESCRIPTION
000	2021/12/13	21455974	JCS	PMP	EPB	EPB	ISSUED FOR BID
001	2022/02/28	21455974	JS	PMP	JSR	EPB	ISSUED FOR CONSTRUCTION

STATE OF MISSOURI
ERIC P. BLUMENSTEIN
NUMBER PE-2013039796