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-0000311
Owner:	Hercules LLC
Address:	Atrium II - North Tower, Suite 500, 5475 Rings Road, Dublin, OH 43017
Continuing Authority:	Hercules LLC
Address:	Atrium II - North Tower, Suite 500, 5475 Rings Road, Dublin, OH 43017
Facility Name:	Former Missouri Chemical Works (MCW)
Facility Address:	11083 Highway D, Louisiana, MO 63353
Legal Description:	Center of Operations: NE ¼, NE ¼, Sec. 29, T 54 N, R 1 W, Pike County
UTM Coordinates:	X = 669962, Y = 4366292
Receiving Waterbody:	groundwater and subsurface to surface water
First Classified Stream and ID:	Mississippi River (P) 3699; Buffalo Creek (P) 0014
USGS Basin & Sub-watershed No.:	Buffalo Creek – Mississippi River (07110007-0702)

This permit authorizes only subsurface and subsurface to surface water discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

FACILITY DESCRIPTION

Coal ash storage subsurface; SIC # 1799; NAICS # 562910. This permit authorizes hydraulicly connected groundwater discharges to surface water. The water at this site is discharged below the river's surface into the receiving waterways.

June 1, 2025
Effective Date

May 31, 2030
Expiration Date

John Hoke, Director, Water Protection Program

FACILITY DESCRIPTION (CONTINUED)

GROUNDWATER MONITORING WELLS

MW-1 UTM Coordinates: X = 669807, Y = 4366417 Total Depth: 19.6 feet BGS

MW-2 UTM Coordinates: X = 669944, Y = 4366389 Total Depth: 19.0 feet BGS

MW-3 UTM Coordinates: X = 670222, Y = 4366262 Total Depth: 19.0 feet BGS

MW-4 UTM Coordinates: X = 670374, Y = 4366285 Total Depth: 15.0 feet BGS

MW-5 Plugged 2012

MW-6 UTM Coordinates: X = 670383, Y = 4366068 Total Depth: 19.5 feet BGS
This is a cross-gradient well, sampling is not required.

MW-7 UTM Coordinates: X = 669593, Y = 4366006 Total Depth: 35.0 feet BGS

IP-1 UTM Coordinates: X = 669863, Y = 4366407 Total Depth: 44.5 feet BGS

IP-4 UTM Coordinates: X = 670368, Y = 4366278 Total Depth: 40.0 feet BGS

IP-5 Plugged 2012

IP-6 UTM Coordinates: X = 670385, Y = 4366066 Total Depth: 44.0 feet BGS
This is a cross-gradient well, sampling is not required.

IP-7 UTM Coordinates: X = 669596, Y = 4366006 Total Depth: 86.0 feet BGS

- BGS = below ground surface
- Wells MW-7 and IP-7 are on a hill and are within the same stratigraphic groundwater level as their MW or IP counterparts; these are considered “up-gradient” wells.
- Corresponding numbers indicate nested wells.
- MW indicates well is screened in the shallow aquifer; IP indicates well is screened in the intermediate aquifer.

A. GROUNDWATER MONITORING REQUIREMENTS

MONITORING WELLS: MW-1, MW-2, MW-3, MW-4, MW-7, IP-1, IP-4, AND IP-7	**TABLE A-1 FINAL LIMITATIONS AND MONITORING REQUIREMENTS**		
The permittee shall sample, using appropriate purging and collection techniques, the above listed wells, effective on **June 1, 2025**.			
EFFLUENT PARAMETERS	UNITS	FINAL IN-SITU LIMITATIONS	MONITORING REQUIREMENTS	
		GROUNDWATER MAXIMUM PER RBCA	MINIMUM MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET A - ANNUAL				
FIELD PARAMETERS				
Depth to Water (Note 1)	feet	*	once per year	measured
Purge Volume (Note 2)	gallons	*	once per year	measured
pH (Note 3)	SU	*	once per year	grab
Turbidity (Note 4)	NTU	*	once per year	grab
METALS				
Arsenic, Total Recoverable	mg/L	199	once per year	grab
Boron, Total Recoverable	mg/L	49,862	once per year	grab
Lead, Total Recoverable	mg/L	138	once per year	grab
Manganese, Total Recoverable	mg/L	1,247	once per year	grab
Mercury, Total	mg/L	9	once per year	grab
Molybdenum, Total Recoverable	mg/L	1,247	once per year	grab
Sulfate	mg/L	6,232,800	once per year	grab
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE JANUARY 28, 2026.				

The above limitations are alternative groundwater limitations based on the validated risk-based assessment, completed June 2023.

* Monitoring and reporting requirement only.

Note 1 The facility will measure static depth to water (to the nearest 0.01 foot) prior to any other sampling activities.

Note 2 The facility will report the final volume of purged water at each well. The facility may report “0” for no-purge sampling methods.

Note 3 The facility will report the final pH value after well stabilization, just prior to collecting groundwater for sample analysis.

Note 4 The facility will report the final turbidity value after well stabilization, just prior to collecting groundwater for sample analysis.

B. 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.

C. SPECIAL CONDITIONS

1. This permit is required by the federal Clean Water Act and Missouri Clean Water Law 644.051.1(2) to continue to permit contaminant sources when closure activities are not completed pursuant to 10 CSR 20-6.010(12) because the ash mass remains. See fact sheet Part III, CLOSURE for discussion.

2. Beneficial re-use of well development water, decontamination water, and purge water is not restricted by this permit.

3. The cap must be maintained such that at least 85% vegetation is established.

C. SPECIAL CONDITIONS (CONTINUED)

4. Cap maintenance shall not disturb the ash mass.

5. Wells shall not disturb the ash mass.

6. The Best Available Technology determination for this facility is currently capped closure in place of ash and Monitored Natural Attenuation (MNA).

7. 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. Dumpsters must remain closed when not in use.
   (b) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, warehouse activities, and other areas, to prevent the contamination of stormwater from these substances.
   (c) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
   (d) 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.
   (e) Provide sediment and erosion control sufficient to prevent or minimize sediment loss off of the property, and to protect embankments from erosion.
   (f) After snow or ice, if the facility applies sand/salt to the pavement of parking lots, sidewalks, or stairs, the facility shall sweep the lots to remove sand/salt as soon as possible after snow or ice melt, collect excess solids, and minimize and control the discharge of solids into stormwater inlets. Salt and sand shall be stored in a manner minimizing mobilization in stormwater (for example: under roof, in covered container, in secondary containment, under tarp, etc.).

8. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original field notes, 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 15 years from the date of the sample, measurement, report or application. This period may be extended by request of the department at any time. Electronic records retention is allowed.

9. 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.

10. 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.

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

12. This permit does not cover land disturbance activities. Normal cap maintenance activities are not considered land disturbance for the purposes of this permit.

13. This permit does not allow stream channel or wetland alterations unless approved by Clean Water Act §404 permitting authorities.

C. SPECIAL CONDITIONS (CONTINUED)

14. 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.

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

16. 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.

17. 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.

18. 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 644.051.15 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.

19. 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) Application materials shall include complete Form A, and all of the following:
        i. A summary of any cap or monitoring well maintenance performed during the last permit term; and
        ii. A summary of the current cap conditions.
        iii. A narrative of any notable changes to the groundwater conditions, analytical values, or the site overall.
        iv. Affirmation that the 2023 final RBCA assumptions maintain relevancy.
        v. A summary of the groundwater data, in a spreadsheet format, collected over the permit term.

D. 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 644.051.12 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-0000311
FORMER MISSOURI CHEMICAL WORKS (ASHLAND, HERCULES)

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: Minor
SIC Code(s):	1799
NAICS Code(s):	562910
Application Date:	01/13/2022
Expiration Date:	12/31/2022
Last Inspection:	05/24/2022

FACILITY DESCRIPTION
Coal ash deposit facility. This facility has elected to perform an MRBCA analysis. This permit reflects the facility's decision; MRBCA's are not required analysis. The department has definitively determined that a subsurface to surface water connection exists due to the proximity of the ash mass to the Mississippi River and the findings of geological information and in the RBCA. See FACILITY DESCRIPTION in the permit for the wells associated with this site. In-Situ groundwater limits were developed based on receptors located in surface waterways. Pursuant to 10 CSR 20-7.015(7)(E) studies which provide information regarding receptors can be used to establish alternative effluent limitations. A TBEL analysis has been completed; the analysis shows that closure in place is the continued allowed technology for the coal ash residuals. Because measuring pollutants in the receiving stream is not feasible, in-situ limits for groundwater were developed. The effluent limit guideline for steam-electric power plants was reviewed as this is similar wastewater. Leachate is defined as the ash contact water which has passed through all or some of the waste mass and flows or percolates through the ground. Leachate is defined in the steam electric ELG as "uncontrolled" when it is not captured and piped out of an outfall.

APPLICATION
The application was received January 13, 2022. The application was verified to remain accurate of the actual operating conditions of the facility in September 2024, because it is greater than one year old. Prior to public notice, the facility has reviewed the permit draft and coordinated with the department ensuring that the draft permit is representative of the facility operations and the application received for this facility.

FACILITY PERFORMANCE HISTORY & COMMENTS
The electronic discharge monitoring reports were reviewed for the last five years; as well as the 2022 inspection report. No findings of note.

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 FL001418607.

OTHER ENVIRONMENTAL PERMITS
In accordance with 40 CFR 122.21(f)(6), the facility reported no other environmental permits are currently held by this facility.

PART II. RECEIVING WATERBODY INFORMATION

RECEIVING WATERBODY TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES	DISTANCE TO SEGMENT	12-DIGIT HUC
Groundwater	n/a	n/a	GW	0.0 mi	Buffalo Creek – Mississippi River (07110007-0702)
Mississippi River	P	3699	DWS, GEN, HHP, IND, IRR, LWW, SCR, WBC-A, WWH (ALP)	approximately 100 feet	
Buffalo Creek	P	0014	HHP, IND, IRR, LWW, SCR, WBC-B, WWH (ALP)	approximately 150 feet	

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).
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

PART III. RATIONALE AND DERIVATION OF PERMIT CONDITIONS

ANTIBACKSLIDING
Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(l)] require a reissued permit to be as stringent as the previous permit with some exceptions. Backsliding (a less stringent permit limitation) is only allowed under certain conditions.
✓ There were no numeric limitations established in the last permit to evaluate.

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), 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.

BIOACCUMULATION
Bioaccumulation is the process by which a compound is taken up by an aquatic organism, both from water and through food. A bioaccumulative pollutant is a chemical that will concentrate in the tissues of an organism over time; generally, older organisms have higher concentrations than younger organisms of that pollutant. Bioaccumulation is concerning when a pollutant has toxic effects and may transfer up trophic levels.

According to the *Technical Support Document For Water Quality-Based Toxics Control* or "TSD" EPA/505/2-90-001; 3/1991, Water quality criteria are derived scientifically and attempt to consider a wide range of toxic endpoints including acute and chronic impacts and bioaccumulation. With that in mind, the department carefully considers which pollutants can receive mixing.

On October 10, 2024, the EPA provided two references for department review.

https://nepis.epa.gov/Exe/ZyPDF.cgi/20003TM1.PDF?Dockey=20003TM1.PDF
Of the pollutants found on this list, lead and mercury are found in this permit.

https://19january2017snapshot.epa.gov/toxics-release-inventory-tri-program/persistent-bioaccumulative-toxic-pbt-chemicals-covered-tri_.html
As this document states, many metals show a potential for trophic transfer via uptake from food, but not in sufficient quantities to result in biomagnification. Those metals which show a propensity to biomagnify include arsenic, methylmercury, and perhaps inorganic mercury. Biomagnification of methylmercury, relative to inorganic mercury, has been attributed to higher lipid solubility and an ability to transfer across membranes, long biological half-life, and long life span of top predators, such as aquatic birds.

These documents informed the department that arsenic, lead, and methylmercury required additional research to determine the effects in the receiving stream and if these pollutants should get mixing or not.

Mixing: 10 CSR 20-7.031 (1)(R) Mixing zone—An area of dilution of effluent in the receiving water beyond which chronic toxicity criteria must be met.

The specific criteria listed in 10 CSR 20-7.031 tables, may receive mixing when the following conditions are fulfilled pursuant to 10 CSR 20-7.031(5)(A)4 for mixing zones. Subparagraph A. The mixing zone shall be exempted from the chronic criteria requirements of this section for those components of waste that are rendered nontoxic by dilution, dissipation, or rapid chemical transformation. Acute numeric criteria of Tables A1, A2, and B1 and whole effluent acute toxicity requirements of subsection (4)(J) must be met at all times within the mixing zone, except within the zone of initial dilution.

10 CSR 20-7.031(5)(B) Toxic Substances. 1. Water contaminants shall not cause the criteria in Tables A1, A2, B1, B2, and B3 to be exceeded. Concentrations of these substances in bottom sediments or waters shall not harm benthic organisms and shall not accumulate through the food chain in harmful concentrations, nor shall state and federal maximum fish tissue levels for fish consumption be exceeded. More stringent criteria may be imposed if there is evidence of additive or synergistic effects.

The department is required to implement, pursuant to 10 CSR 20-7.015(9)(A)2. water quality-based effluent limits based on a waste load allocation in accordance with federal regulations (40 CFR 122.44(d)(1)), which would address pollutants that have a reasonable potential to cause or contribute to an excursion above Water Quality Standards established in 10 CSR 20-7.031.

However, when reasonable potential is determined, it is necessary to determine if a wasteload allocation will receive mixing. Several factors that determine if any given pollutant can receive mixing considerations are 1) the discharge must be to a permanent stream; 2) a zone of passage is maintained, typically at least ¼ of the stream volume; 3) the mixing zone does not result in waterbody impairment; and 4) bioaccumulation factor is below 100.

TSD Page 91/355: The potential for a pollutant to bioaccumulate in living organisms is measured by (1) the bioconcentration factor (BCF), which is chemical-specific and describes the degree to which an organism or tissue can acquire a higher contaminant concentration than its environment (e.g., surface water); (2) the duration of exposure; and (3) the concentration of the chemical of interest. While any BCF value greater than 1 indicates that bioaccumulation potential exists, bioaccumulation potential is generally not considered to be significant unless the BCF exceeds 100 or more. Thus, a chemical that is discharged to a receiving stream, resulting in low concentrations, and that has a low BCF value will not create a bioaccumulation hazard. Conversely, a chemical that is discharged to a receiving stream, resulting in a low concentration but having a high BCF value, may cause in a bioaccumulation hazard. Also, some chemicals of relatively low toxicity, such as zinc, will bioconcentrate in fish without harmful effects resulting from human consumption.

TSD 2.4.5 p 59/335 Table 2-l shows the ratio of the bioaccumulation factor (BAF) to the BCF as a function of the trophic level of the aquatic organism, and the log P (log octanol-water partition coefficient) of the chemical. The BAF/BCF ratio ranges from 1 to 100, with the highest ratios applying to organisms in higher trophic levels, and to chemicals with log P close to 6.5. For chemicals with log P values greater than about 7, there is some uncertainty regarding the degree of bioaccumulation, but generally, trophic level effects appear to decrease due to slow transport kinetics of these chemicals in fish, the growth rate of the fish, and the chemical's relatively low bioavailability.

The department does not provide mixing to chemicals that have been determined to be bioaccumulative. Parameters within this permit were reviewed for bioaccumulation. While each parameter may have varying degrees of bioaccumulation, the levels of toxicity were accounted for when developing the protections for aquatic life (AQL) criteria. The bioaccumulative rates for pollutants found in this permit do not impact the overall derivation of the effluent limits. Missouri's protection of aquatic life water quality criteria for the pollutants found within this permit have already accounted for the possibility of bioaccumulation.

CLOSURE

A closure plan was submitted on January 14, 2013 (*Ash Pond Engineering Report, Missouri Chemical Works Facility* [Arcadis 2013]) and was approved in a letter from MDNR on February 25, 2013. Documentation that closure activities were completed per the plan was in a report titled *Missouri Chemical Works Facility, Louisiana, Missouri, Ash Pond Closure Project, Construction Quality Acceptance Report* and dated January 2015 (CB&I 2015) and in the Ash Ponds Closure Construction As-Build drawings, both of which were provided by Arcadis to MDNR with a cover letter dated January 7, 2015. In this closure plan, the facility described leaving the ash in the ground (closure in place) and capping with a vegetative cover. The department allowed this method of closure, but a permit in perpetuity is required because the ash remains.

To properly decontaminate (closure by removal) and permanently close any wastewater basin, 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

This facility, at this time, is not required to complete closure by removal.

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.

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 and ancillary wastewater. Sewage sludge is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for productive use (i.e. fertilizer) and after having pathogens removed.

✓ Not applicable; this facility does not have domestic wastewater facilities.

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.

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 required to monitor groundwater for the water protection program. The limits established in this permit protect surface waters. The RBCA determined that substitute groundwater limits were appropriate pursuant to 10 CSR 20-7.015(7)(E)6.A. 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.

HYDRAULIC CONNECTION THROUGH GROUNDWATER TO SURFACE WATER:
A point source does not need to *directly* discharge into a regulated waterbody to be considered a discharge into Waters of the United States (WOTUS). The department continues to permit both direct discharges, as well as discharges that are the "functional equivalent" of a direct discharge under the NPDES, UIC, and State program to protect the beneficial uses of Missouri's regulated surface and groundwater. Discharges subsurface in the subsurface to surface water regime, are discussed and required for evaluation under this permit. The recent court case, "Maui" (*County of Maui Hawaii v. Hawaii Wildlife Fund)* ultimately concluded on April 23, 2020 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.

Missouri has recently clarified that discharges to or into groundwater must also consider hydraulic connections to surface water, meaning discharges to the subsurface in areas of regular surface water interaction (e.g. large river alluvial areas, discharges percolating subsurface, and losing stream situations) may 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.

As Missouri already has laws and regulations protecting both groundwater and surface water, and as the department already permits no-discharge facilities, underground injection, surficial discharging facilities, discharges to losing streams, and potential groundwater impacts, recent federal court decisions have not resulted in dramatic differences in permitting pertaining to groundwater protection and groundwater conveyance into surface waters in Missouri. Department permit writers already evaluate protection of all potentially impacted waters of the state. Recent court decisions have simply clarified the obligation on facilities and the department 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, and the hydraulic connections between them.

It is noted that the typical Risk-Based Corrective Action (RBCA) method of determining risk to human health and the environment leaves out a large portion of life – aquatic species. It is unclear why the national guidance dismissed this use of waters. After review of Missouri's water quality standards, some parameters have lower surface water quality criteria than Missouri groundwater standards or the lowest default target level (DTL) established for groundwater or drinking water in MRBCA. For this facility, the department noted that lead was one of those cases, therefore the chronic protection of aquatic life was used to determine the AGWL. See Part VI EFFLUENT LIMITS DETERMINATION for more information.

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.

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. Through information submitted to the department, the facility has determined that discharges through groundwater are entering the Mississippi River and the department agrees with the RBCA determinations.

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, the Missouri Clean Water Law, 644 RSMo.

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 not subject to 40 CFR 257 Subpart D (for brevity, "§D"), this permit makes no claims to implement or develop 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.

LAND APPLICATION

Land application, or surficial dispersion of wastewater and/or sludge, is 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.

✓ 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 do 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.

MAJOR WATER USER

Any surface or groundwater user with a water source and the equipment necessary to withdraw or divert 100,000 gallons (or 70 gallons per minute) or more per day combined from all sources from any stream, river, lake, well, spring, or other water source is considered a major water user in Missouri. https://dnr.mo.gov/water/business-industry-other-entities/reporting/major-water-users All major water users are required by law to register water use annually (Missouri Revised Statutes Chapter 256.400 Geology, Water Resources and Geodetic Survey Section). https://dnr.mo.gov/document-search/frequently-asked-major-water-user-questions-pub2236/pub2236

✓ Not applicable; this facility cannot withdraw water from the state in excess of 70 gpm or 0.1 MGD.

MODIFICATION REQUESTS

Facilities have the option to request a permit modification from the department at any time under RSMo 644.051.15. 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.

MONITORING WELLS:

This permit does not and cannot stipulate required closure or maintenance of monitoring wells. The facility will provide well closure information to the Missouri Geological Survey. https://dnr.mo.gov/land-geology/geology

PERMIT SHIELD

The permit shield provision of the Clean Water Act (Section 402(k)) and Missouri Clean Water Law (644.051.22 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) requires 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 effluent limits 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, effluent limits 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 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 not implemented for stormwater as 10 CSR 20-7.015(9)(L) does not apply to stormwater. Precipitation can itself be acidic, or may contain run-in from other un-controlled areas and can provide false positives. 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 (MDC) 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.

TSD methods encountered may be § 3.3.2, § 5.7.3 for metals, and § 5.4.1 for chloride. Part IV EFFLUENT LIMIT DETERMINATIONS provides specific decisions related to this permit.

- ✓ Groundwater RPAs were performed for this permit. There is no RP for any parameter in surface water because alternative groundwater limits are appropriate under the findings of the RBCA.
- ✓ This facility performed an RBCA and the results of the RBCA did not find groundwater receptors; therefore even though Arsenic was found above the groundwater standards of 50 µg/L, Boron was found above the irrigation standard of 2000 µg/L and Sulfate was found above the drinking water standard of 250 mg/L there is no RP. Additional information about receptors is found in the RISK-BASED CORRECTIVE ACTION (RBCA) section below.

A reasonable potential analysis was completed for the subsurface-to-surface connection, no pollutants exhibited RP because the in-stream surface water WQS was not exceeded. Missouri regulations allow mixing allowances. Therefore, even though some of the in-well pollutant data is above Missouri surface WQS, the Mississippi River provides significant dilution.

To estimate the groundwater flux discharging to the Mississippi River and Buffalo Creek, a three-dimensional numerical groundwater flow model was constructed in the RBCA. Groundwater flow modeling was conducted using the Modular Three-Dimensional Finite-Difference Groundwater Flow Model (MODFLOW; McDonald and Harbaugh 1988). The groundwater flow model covers an area of approximately 2.3 square miles. The northeastern model boundary is the Mississippi River and the southeastern model boundary aligns with Buffalo Creek. The model is vertically discretized into six layers to represent the HSUs present in the unconsolidated sediments. This vertical discretization allows for the groundwater flux to be directly assessed in each HSU. Model Layer 1, the uppermost model layer, represents the saturated fill material of the former ash pond and the shallow silts and clays common to the shallow HSU near the Site. Model Layer 2 represents the primary clay unit underneath the fill, with intermittent sand lenses of the middle portion of the shallow HSU. Model Layer 3 represents the bottom of the shallow HSU and is primarily composed of clay. Model Layer 4 represents the predominantly sand portion of the intermediate HSU. Model Layer 5 represents the relatively thin, 2- to 4-foot-thick gravelly sand at the base of the intermediate HSU. Model Layer 6 represents the predominantly clay deep HSU that is underlain by the limestone of the Maquoketa Formation (bedrock). Surface water features simulated in the groundwater flow model include the Mississippi River, Buffalo Creek, and several ponds that fall within the model domain. The Mississippi River is represented by constant head cells with elevations set based on nearby surface water gauging stations USCE 392709091025001 (Mississippi River at Louisiana, MO [CORPS]), U.S. Geological Survey (USGS) 05501600 (Mississippi River at Hannibal, MO), and USGS 05587450 (Mississippi River at Grafton, IL). Buffalo Creek is represented by river cells, and elevations were guided by topographic maps and the interaction between Buffalo Creek and the stage of the Mississippi River. The ponds that fall within the model domain are simulated as high hydraulic conductivity zones. Recharge was estimated from annual precipitation data collected at station USC00235098 (Louisiana, MO).

The groundwater flow model was calibrated to relatively low stage conditions of the Mississippi River in November 2017 to allow for the maximum groundwater flux toward the Mississippi River. Ten water levels recorded in the shallow HSU and intermediate HSU were used as calibration targets to refine the hydraulic properties of the groundwater flow model within the ranges of site-specific and literature values.

For mercury, 2016 information was used; 2016 was the last time that mercury was tested at the site. The laboratory reporting limit at that time was 0.2 µg/L; the reporting limit was used instead of the detections of mercury, which did occur, but were below the reporting limit. However, to be as conservative as possible, the highest number (the reporting limit) was used in the RP determination.

The calibrated groundwater flow model was then used to compute the volumetric flux toward the Mississippi River and Buffalo Creek in each simulated model layer under a range of stages for the Mississippi River. The highest groundwater flow values were used to calculated reasonable potential in surface water. RP was calculated for both the Mississippi River and Buffalo Creek using the different flow scenarios.

Background Data Averages:

Arsenic, Dissolved	Arsenic, Total	Boron, Dissolved	Boron, Total	Lead, Dissolved	Lead, Total	Manganese, Dissolved	Manganese, Total	Mercury	Sulfate
2.97	2.18	27.51	31.01	2.59	6.60	18.10	169.60	0.011	30.28

These data were pulled from Missouri's database of water quality data and from unpublished Illinois EPA data. The data represent upstream conditions within the Mississippi River. In all instances, the Missouri data was higher than the much more recent IL EPA data, therefore only the published Missouri data was used. By using the higher average, the department is providing another layer of conservativeness when determining reasonable potential. For each parameter, the highest of the average, either total or dissolved, was used. There are no surface water quality criteria for manganese. Mercury data was not available upstream of the facility; the data obtained was downstream of the site. All data is in µg/L except for sulfate, which is in mg/L.

For the Mississippi River, the low flow of 37,185 cfs, and the groundwater flow of 195 gpm (0.2808 MGD) was used to determine reasonable potential. Average background in-stream concentrations from the Mississippi River were used to determine RP for both rivers.

Mississippi River RPA:

Parameter:	Units	CMC Acute	CCC Chronic	Listing	Daily Max	Monthly Average	n#	CV	n Max	MF	RWC Acute	RWC Chronic	RP
Arsenic	µg/L	340	150	AQL	3711	1280	100	1.525	81	2.0	17.4	3.0	No
Arsenic	µg/L	n/a	100	IRR	3796166	1309382	100	1.525	81	2.0	17.4	3.0	No
Boron, TR	µg/L	n/a	2000	IRR	77909262	28898896	100	1.198	13000	1.8	2170.5	32.1	No
Lead, TR	µg/L	207.31	8.08	AQL	2215	743	100	1.716	10	2.1	7.9	6.6	No
Mercury, Total	µg/L	1.40	0.8	AQL	15	8	1	0.600	0.2	13.2	0.2	0.0	No
Selenium, TR	µg/L	n/a	5	AQL	175751	87604	1	0.600	5.1	13.2	6.1	0.0	No
Silver, TR	µg/L	13.36	n/a	AQL	147	73	1	0.600	10	13.2	12.0	0.0	No
Sulfate	mg/L	n/a	250.00	DWS	7070129	2140305	100	3.348	360000	2.7	88767.4	75.9	No
Thallium, TR	µg/L	n/a	6.3	HHP	270451	134808	3	0.600	25	5.6	12.8	0.0	No

Flow into Buffalo Creek from the groundwater is a lower volume because only the uppermost geologic layer discharges to Buffalo Creek (as determined though geologic evaluation); all 5 scenario volumes were averaged, resulting in an average flow of 23.4 gpm (0.033 MGD). For Buffalo Creek, bank-full statistics were used instead. This part of Buffalo Creek is mainly a backwater area, with little direct stream flow. Because this is a groundwater to surface water scenario, upstream flow for small streams is irrelevant as protection of aquatic species is dependent on the subsurface connection, and not a piped discharge. Bank-full statistics show that an average of 128 square feet are available for mixing. This value is transformed into a volume (assuming the height is the same as the length and width) using the equation: $\sqrt{128} = 11.313$; $11.313^3 = 1{,}147$ cubic feet (cf) of water is available for mixing.

Buffalo Creek RPA:

Parameter:	Units	CMC Acute	CCC Chronic	Listing	Daily Max	Monthly Average	n#	CV	n Max	MF	RWC Acute	RWC Chronic	RP
Arsenic	µg/L	340	150	AQL	3,708	1,279	100	1.5	81	2.0	17.4	3.0	No
Arsenic	µg/L	n/a	100	IRR	975,932.99	336,621.07	100	1.5	81	2.0	17.4	3.0	No
Boron, TR	µg/L	n/a	2000	IRR	20,029,175	7,429,425	100	1.2	13000	1.8	2172.0	35.3	No
Lead, TR	µg/L	207.31	8.08	AQL	2,213	742	100	1.7	10	2.1	7.9	6.6	No
Mercury, Total	µg/L	1.40	0.8	AQL	15.28	7.62	1	0.6	0.2	13.2	0.3	0.0	No
Selenium, TR	µg/L	n/a	5	AQL	45,182	22,522	1	0.6	5.1	13.2	6.1	0.0	No
Silver, TR	µg/L	13.36	n/a	AQL	147	73	1	0.6	10	13.2	12.0	0.0	No
Sulfate	mg/L	n/a	250.00	DWS	1,817,642	550,246	100	3.3	360000	2.7	88829.3	207.7	No
Thallium, TR	µg/L	n/a	6.3	HHP	69,528	34,657	3	0.6	25	5.6	12.8	0.0	No

The department has made a reasonable potential determination and determined that there are no pollutants having RP on the surface waters therefore, and pursuant to 40 CFR 122.44(d)(iii), that none of the subsurface to surface water discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of Missouri's numeric criteria within Missouri's water quality standard for any individual pollutant, therefore the permit does not contain numeric WQBELs for surface water.

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.

RISK-BASED CORRECTIVE ACTION (RBCA)
Increasingly, environmental decisions are being described as "risk based," especially in site cleanup and corrective actions, where risk-based decisions are thought of as more appropriate and cost-effective than decisions based either on "background" or "non-detectable" levels of chemicals or on numerical criteria developed without recognition of risk assessment principles. Site characterization is the method used by cleanup programs to establish the nature and extent of contamination and subsequently any risks potentially posed by contamination at sites. During site characterization, sampling and analysis plans are implemented, and field data are collected and analyzed to determine the nature and extent of threats to human health and the environment. Risk assessment activities are ideally intertwined with site characterization activities, with an eye on informing the risk management decisions that need to be made. Therefore, site characterization activities are ideally designed to support risk assessments, which in turn support risk management decision making.

These considerations emphasize the need for an approach where a conceptual site model (CSM) is developed early and is iteratively refined through the project life cycle. Each piece of data that is collected should serve to refine the model. Risk assessment uses site characterization information to provide a means to inform management of risks at a site. Exploring and clarifying the connections between sampling, risk assessment, and risk management are therefore desired outcomes of this current effort and related activities.

The workplan for the MRBCA analysis was approved December 2, 2022; and the final RBCA was received June 2023 and incorporated into this permit renewal.

The RBCA determined there were no direct receptors for groundwater at the site. However, as groundwater is expected to flow through the alluvium into the Mississippi River, Alternative RBCA values were calculated to maintain protection of surface water uses. Because there are no receptors for groundwater, no groundwater values were used in the calculation of permit limits.

The facility used representative ecological receptors to determine appropriate effluent limits. Species expected to use the identified surface water features downgradient of the Site were selected as representative ecological receptors. These aquatic and semiaquatic species include those that reside and forage primarily in shoreline or ponded areas along the Mississippi River, Buffalo Creek, or slough. Because evaluating potential risk to each species is not feasible, general classes of ecological receptors or indicator species representing general functional groups that may be exposed to COCs in affected habitat were selected for assessment.

Fish and benthic invertebrates were evaluated as a class. For wildlife, consistent with USEPA (1997) guidance, species with potential for exposure to COCs and available toxicological data from the literature were selected as receptors. The following aquatic ecological communities/indicator species were selected:
• Aquatic life
• Benthic invertebrates
• Herbivorous bird: mallard (*Anas platyrhynchos*)
• Herbivorous mammal: muskrat (*Odatra zibethicus*)
• Omnivorous bird: lesser scaup (*Aythya affinis*)
• Omnivorous mammal: raccoon (*Procyon lotor*)
• Piscivorous bird: great blue heron (*Ardea Herodias*)
• Piscivorous mammal: American mink (*Neovison vison*)
• Sensitive insectivorous mammal: Indiana bat (*Myotis sodalist*)

Surface water concentrations were determined for boron and manganese, at 2 and 0.05 mg/L respectively. From this information, a calculation was derived to limit all pollutants of concern. The boron standard is based on the maximum recommended concentration for irrigation water (U.S. Department of Agriculture [USDA] 2011; boron concentrations greater than 2 mg/L may affect sensitive crops), and the manganese standard of 0.050 mg/L is the USEPA federal secondary maximum contaminant level (SMCL) based on prevention of staining and bitter taste in water used for potable purposes.

There are no state water standards or national recommended ambient water quality criteria protective of uses other than irrigation and drinking water (e.g., aquatic life, recreation) for boron and manganese. Therefore, in addition to considering the Missouri WQS, the Tier 3 RA evaluates other available screening levels for boron and manganese protective of recreational use, aquatic life, and aquatic wildlife from regulatory agencies (e.g., USEPA Region 4) and other appropriate sources (e.g., Great Lakes Initiative Clearinghouse; Suter and Tsao 1996). Additionally, if available screening levels are outdated or have a basis that is not applicable to the Site, then target concentrations were calculated per Missouri water quality regulations (10 CSR 20-7).

The department agrees with the results of the MRBCA analysis. This agreement, does not however, eliminate the potential for any future permit limit changes.

SAMPLING FREQUENCY JUSTIFICATION
Sampling frequency was based on site conditions.

SCHEDULE OF COMPLIANCE (SOC)
A schedule of 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.

✓ This permit does not contain an SOC.

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. Standard Conditions Part III, if attached to this permit, incorporate requirements dealing with domestic wastewater, domestic sludge, and land application of domestic wastes.

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.

✓ Not applicable; this facility's SIC code does not require stormwater monitoring per 40 CFR 122.26(b)(14) or 10 CSR 20-6.200 nor does a vegetative cap require monitoring of the stormwater. This facility is not considered a solid waste facility.

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 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.

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.

The BAT analysis is described below to ensure technology requirements and technology based effluent limits are included in this permit for the CWA discharge; see HYDRAULIC CONNECTION THROUGH GROUNDWATER INTO SURFACE WATER section above. This technology assessment only evaluates the surface water component of the discharge; as the CWA only deals with discharges to surface water and does not include groundwater.

BPJ- CASE-BY-CASE ASSESSMENT FOR SURFACE DISCHARGES

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]

After determining that coal ash was not Subtitle C, the EPA, on April 17, 2015, 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], pursuant to 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. However, EPA Region 7 wishes the department to conduct a TBEL analysis of the Maui-type discharge for the purposes of this permit; reference HYDRAULIC CONNECTION THROUGH GROUNDWATER TO SURFACE WATER section above.

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. Intentionally, in Subtitle D, the EPA included characterizations of site hydrogeology, which includes surface water; closure requirements also considered surface water 40 CFR

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

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.

The federal effluent limitation guideline (ELG) for power plants, 40 CFR 423, does not apply to this facility as this facility was not primarily engaged in the sale of electricity; the electricity was generated for powering on-site manufacturing. However, the ELG was reviewed to inform pollutants of concern for coal ash leachate. Per the ELG, leachate is any water that flows through ash, out of the waste mass; even if that leachate is not captured in a system and discharged through a pipe. Therefore, the department is considering all pollutant parameters that the ELG establishes for leachate. These are: arsenic and mercury. Arsenic was already established as a pollutant of concern; mercury is being added. This permit does not implement the ELG limits because the department has determined that the ELG does not apply.

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.

After thoughtful consideration, the department will consider the requirements in 40 CFR 423 for the appropriate waste streams because the case-by-case BAT determination would be similar 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 reasonable limitations as appropriate to similar waste-streams generated by this facility.

Remedial activities for in-situ coal ash are a complex and ever-evolving field. The technologies used to remediate groundwater contaminated with coal ash pollutants 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. Or, 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 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.

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

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.

40 CFR 125.3(d) Analysis

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 equipment.

- 40 CFR 125.3(d)(3)(ii) The process employed: the facility has no process.

- 40 CFR 125.3(d)(3)(iii) The engineering aspects of the application of various types of control techniques.
  The department has reviewed several strategies relating to cleanup programs[6]. Also evaluated, were pump-treat-discharge[7] scenario and clean closure.[8]
  Each of the scenarios engineering was reviewed. Each requirement is technically feasible at this site.

- 40 CFR 125.3(d)(3)(iv) Process changes: any technological addition would be a change to the site.

- 40 CFR 125.3(d)(3)(v) The cost of achieving such effluent reduction.
  The 2024 development document[9] for 40 CFR 257 Subpart D was reviewed. The 2024 revision included new requirements for closed impoundments at operating facilities; this is a coal ash impoundment. The EPA estimated that there were approximately 194 impoundments this rule revision would cover. (The department does not provide a stance whether this facility is subject to 40 CFR 257 §D.) The Regulatory Impact Analysis (RIA) estimated $123-$135 million is attributable to the revised requirements for legacy CCR surface impoundments. This means that for each waste management unit (WMU) the EPA estimated that approximately $634,000 to $695,900 dollars would be necessary under the Coal Ash Rule per year for each unit to comply with that regulation. This facility is not generating revenue. All costs will be over 120% above baseline technology which is MNA.

- 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 RBCA has already certified that there are no receptors.

While 40 CFR 125.3(d) requires the department to consider each factor, the department has latitude to provide more or less weight to any requirement. The EPA has determined that "technically sound permit conditions" means that the conditions are achievable with existing technology; and "reasonable" means that the conditions are achievable at a cost that the facility can afford. Historically, some of the other factors, such as age, process employed, and non-water quality impacts have assumed lesser importance than the technical and economic feasibility evaluations.[10]

Similar Sites Assessment

Part of the BPJ BAT decision making process is utilizing similar regulations and determining if the resulting numeric requirements are appropriate for this facility. 40 CFR 423 includes requirements for leachate where the EPA used two parameters, arsenic and mercury, as indicator parameters for all of the metals traditionally found in coal ash. The 2024 Steam Electric ELG Development Document[11] was reviewed. Arsenic has historically been one of the most prevalent pollutants in CCR damage cases and under this final rule is also one of the two indicator pollutants monitored to demonstrate compliance with the BAT limitations for discharges of unmanaged CRL. While this regulation establishes technology-based limitations, the daily and monthly arsenic limitations being finalized are very close to, and bracket, the health-based arsenic standard in the CCR regulations. EPA data indicated 32.2 µg/L and 0.94 µg/L was the average level of arsenic and mercury, respectively, in untreated combustion residual leachate. The ELG determined that chemical precipitation was the chosen technology for CRL discharges, and promulgated the below requirements for CRL at applicable facilities.

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[6] https://dnr.mo.gov/document-search/monitored-natural-attenuation-groundwater-contamination-brownfields-voluntary-cleanup-program-sites-pub2110/pub2110
[7] https://semspub.epa.gov/work/HQ/174123.pdf
[8] https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/oira_2050/2050_102809-2.pdf
[9] https://www.federalregister.gov/documents/2024/05/08/2024-09157/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric
[10] EPA Permit Writers Manual https://www3.epa.gov/npdes/pubs/chapt_05.pdf
[11] https://www.epa.gov/system/files/documents/2024-04/se11757_steam-electric-elg-tdd_508.pdf

Decision
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. Because any technology required would be over 125% of the cost of achieving lower limits, no additional technology is required, therefore the RBCA effluent limits are the most stringent and protective.

The BAT decision remains the current technology, which is capping and closure in place. The department, through allowance of the subsurface to surface water 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
The department has determined that the surface stormwater discharge at this site is not a regulated "industrial stormwater" discharge. No further assessment is necessary of the stormwater; however, the facility will maintain the appropriate ground cover to ensure that there is no industrial exposed stormwater, such as stormwater which has contacted ash. Therefore the TBEL for stormwater is vegetative capping.

UNDERGROUND INJECTION CONTROL (UIC)
The UIC program for all classes of wells in the State of Missouri is administered by the Missouri Department of Natural Resources and approved by EPA pursuant to §§1422 and 1425 of the Safe Drinking Water Act (SDWA) and 40 CFR 147 Subpart AA. Injection wells are classified based on the liquids which are being injected. Class I wells are hazardous waste wells which are banned by 577.155 RSMo; Class II wells are established for oil and natural gas production; Class III wells are used to inject fluids to extract minerals; Class IV wells are also banned by Missouri in 577.155 RSMo; Class V wells are shallow injection wells; some examples are heat pump wells and groundwater remediation wells. Domestic wastewater being disposed of sub-surface is also considered a Class V well. In accordance with 40 CFR 144.82, construction, operation, maintenance, conversion, plugging, or closure of injection wells shall not cause movement of fluids containing any contaminant into Underground Sources of Drinking Water (USDW) if the presence of any contaminant may cause a violation of any drinking water standards or groundwater standards under 10 CSR 20-7.031, or other health based standards, or may otherwise adversely affect human health. If the director finds the injection activity may endanger USDWs, the department may require closure of the injection wells, or other actions listed in 40 CFR 144.12(c), (d), or (e). In accordance with 40 CFR 144.26, the facility shall submit a Class V Well Inventory Form for each active or new underground injection well drilled, or when the status of a well changes, to the Missouri Department of Natural Resources, Geological Survey Program, P.O. Box 250, Rolla, Missouri 65402. The Class V Well Inventory Form can be requested from the Geological Survey Program or can be found at the following web address: https://dnr.mo.gov/document-search/class-v-well-inventory-form-mo-780-1774 Single family residential septic systems and non-residential septic systems used solely for sanitary waste and having the capacity to serve fewer than 20 persons a day are excluded from the UIC requirements (40 CFR 144.81(9)). The department implements additional 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, and the public.
✓ Subsurface discharges to groundwater from an ash pond are not UIC.

VARIANCE
Per the Missouri Clean Water Law §644.061.4, variances shall be granted for such period of time and under such terms and conditions as specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141. Thermal variances are regulated separately and are found under 644.
✓ Not applicable; this permit is not drafted under premise of a petition for variance.

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.
✓ WET testing in groundwater is not required; aquatic organisms like fish do not live in groundwater, and the limits established in this permit are protective of aquatic organisms, as established by the RP calculations.

PART IV. EFFLUENT LIMITS DETERMINATION

CALCULATING ALTERNATIVE RBCA-BASED GROUNDWATER LIMITS (AGWL)

The facility completed a Risk-Based Corrective Action report, June of 2023. The analysis concluded there were no affected receptors. This permit establishes final limits, to be monitored in the groundwater, that control pollution in the receiving stream based on the results of the RBCA. Alternative limits pursuant to a validated RBCA analysis are allowed pursuant to 10 CSR 20-7.015(7)(E)6.A. and implemented per 6.B. of the same section.

Because there is no RP for the subsurface to surface water connection, there are no WQBELs established in this permit. Only pollutants with RP are required to have WQBELs established per 40 CFR 122.44(d)(iii).

Data Review

Parameter	Units	In-Situ Minimum Reported	In-Situ Maximum Reported
Arsenic	µg/L	0.31	81
Boron	µg/L	39	13,000
Lead	µg/L	0.1	10
Manganese	µg/L	13	31,000
Molybdenum	µg/L	0.61	280
Sulfate	mg/L	5.5	3,300

These data were gathered from the most recent permit term per the eDMR system and include all wells, upgradient, side-gradient, and downgradient. However, the operating permit issued to the facility on August 1, 2017 indicated that mercury was not present at the site, however, there were detections but below quantifiable analytical methods at the time. Historic mercury sampling the method detection limit was 0.052 µg/L, and the laboratory used a reporting limit of 0.2 µg/L. Missouri water quality criteria are 1.4 µg/L for the acute, and 0.77 µg/L for chronic protection of aquatic wildlife; and 2 µg/L in groundwater. Mercury is being added back in to the permit based on information from the Steam Electric Effluent Limitation Guideline Development Document.

Because Monitored Natural Attenuation (MNA) was the chosen Best Available Technology, the AGWLs are implemented as targeted levels in this permit.

Alternative concentration limits in groundwater were calculated using the dilution attenuation factor (DAF) estimated from the groundwater model and target surface water concentrations. The DAF represents the dilution the groundwater undergoes naturally when it mixes with surface water in the Mississippi River and Buffalo Creek. The volumetric DAF based on the groundwater flux and surface water flow assumes instantaneous mixing rather than discrete mixing that would typically occur at a point source. Alternative groundwater limits (AGWL, GWsw) were calculated using the lowest applicable target surface water concentration (Csw) and a groundwater-to-surface water DAF as shown here. The DAF for this facility is 31,164. Because the bulk of the groundwater does not flow to Buffalo Creek, and Buffalo Creek is a backwater of the Mississippi River in this area, the DAF for the Missouri River was used to determine in-situ limits. No reasonable potential was established above, see REASONABLE POTENTIAL in Part III of the fact sheet. Because there is no RP, TBEL limits were developed using the MRBCA DAF.

The federal effluent limitation guideline (ELG) for power plants, 40 CFR 423, does not apply to this facility as this facility was not primarily engaged in the sale of electricity; the electricity was generated for powering on-site manufacturing. However, the ELG was reviewed to inform pollutants of concern for coal ash leachate. Per the ELG, leachate is any water that flows through ash, out of the waste mass; even if that leachate is not captured in a system and discharged through a pipe. Therefore, the department is considering all pollutant parameters that the ELG establishes for leachate. These are: arsenic and mercury. Arsenic was already established as a pollutant of concern; mercury is being added. This permit does not implement the ELG limits because the department has determined that the ELG does not apply.

$$GWsw\ (mg/L) = DAF * Csw\ (mg/L)$$
$$GWsw * 0.8\ \text{safety factor} = \text{final permit limit}$$

This permit adds in a margin of safety factor of 20 percent, therefore the result is multiplied by 80%. This is consistent with other calculations, such as TMDL development, and methods for alternative effluent limit calculations. For each level of uncertainty, a factor of 10 can be added. For this permit, the safety factor of 20 was chosen to account for 1) extreme drought conditions and very low level of water in the Mississippi River; and 2) pollutant loading from other sources. See Technical Support Document for Toxics Control; Appendix H, at https://www3.epa.gov/npdes/pubs/owm0264.pdf

IN-SITU LIMITS

Parameter	DAF	SW Max (mg/L)	Safety Factor	mg/L In-Well RBCA Limit
Arsenic	31,164	0.008	0.8	199
Boron	31,164	2	0.8	49,862
Lead ♠	31,164	0.005532	0.8	138
Manganese	31,164	0.05	0.8	1,247
Mercury ♣	31,164	0.000356	0.8	9
Molybdenum ♦	31,164	0.05	0.8	1,247
Sulfate	31,164	250	0.8	6,232,800

♠ To calculate GWsw for lead, the chronic surface water protection of aquatic life was used.
Chronic AQL: e^(1.273 * ln208 – 4.704797) * (1.46203 – ln208 * 0.145712) = 5.532 µg/L [at hardness 208]

♣ To calculate the GWsw for arsenic and mercury, the chronic ELG values, 8 µg/L, and 356 ng/L respectively, were used. These values are more protective than established MCLs or Missouri groundwater criteria.

♦ There are no groundwater or surface water standards for molybdenum, however, the proposed Maximum Contaminant Level (MCL) is 50 µg/L per 40 CFR 257.95(h)(2)(iv); therefore the MCL standard was used to determine GWsw.

PART V. ADMINISTRATIVE REQUIREMENTS

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

PUBLIC NOTICE
The department shall give public notice 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 pending 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 first Public Notice period for this operating permit started January 27, 2023, and ended February 27, 2023. The EPA submitted a letter objecting to issuance of the permit. Instead of responding, and because the department received the results of the RBCA analysis, the department did not issue the permit and revised the permit. Because the permit is substantively different, and the department is supplying the revised draft to EPA, the interim objection is nullified, and the review process has re-started.
- ✓ The second Public Notice period for this operating permit started March 21, 2025, and ended April 21, 2025.
  - On April 15, 2025, the EPA called to request a change. The EPA requested that the permit clearly authorize discharge into surface waters.
    - ✓ A note was added on page 1 overtly allowing the discharge into surface waters.

DATE OF FACT SHEET: APRIL 22, 2025

COMPLETED BY:
PAM HACKLER, ENVIRONMENTAL ANALYST SCIENTIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL UNIT
(573) 526.3386
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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.

ARCADIS

Ms. Pam Hackler
Missouri Department of Natural Resources
Water Protection Program; Industrial Wastewater Permitting
P.O. Box 176
Jefferson City, Missouri 65102-0176

Date: January 13, 2022
Our Ref: 30109893.0002
Subject: Renewal Application for NPDES Permit No. MO0000311,
Former Missouri Chemical Works, Louisiana, Pike County, Missouri

Arcadis U.S., Inc.
Rosehill Office Park 1
8725 Rosehill
Suite 350
Lenexa
Kansas 66215
Phone: 913 492 0900
Fax: 913 492 0902
www.arcadis.com

Dear Ms. Hackler:

On behalf of Hercules, LLC, a wholly owned subsidiary of Ashland, LLC (Ashland), Arcadis U.S., Inc. (Arcadis) is submitting the enclosed NPDES permit renewal application to the Missouri Department of Natural Resources (MDNR) for the former Missouri Chemical Works (MCW) facility located at 1183 Highway D, Louisiana, Pike County, Missouri. The application for existing permit number MO0000311 is being submitted within 180 days of the permit expiration date of July 31, 2022, as required by 644.051RSMo.

As required to accompany the renewal application, the following additional information is attached:

- Table 1 Summary of Monitoring Well Network (see application Section 8.1)
- Figure 1 Site Location Map
- Figure 2 Monitoring Well Location Map

Ashland understands the MDNR may send an invoice for fees required as part of the application review and permit procurement; therefore no fees are included in this submittal. In addition, it is understood that the MDNR is currently working on a general permit that may supersede this renewal provided herein.

If you have any questions concerning the enclosed renewal application, please contact Tina Lloyd of Arcadis at (913) 998-6916 or Jim Vondracek of Ashland at (614) 323-5448.

Sincerely,
Arcadis U.S., Inc.

Tina M. Lloyd

Tina Lloyd
Principal Geologist
Missouri Registered Geologist No. RG0248

Email: Tina.Lloyd@arcadis.com
Direct Line: 913 998 6916

Copies:
James Vondracek, Ashland
Bill Golla, Arcadis U.S., Inc.

rec'd 01/13/22 AP 38173

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 – 0000311, 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	
Former Missouri Chemical Works (MCW)		(614) 790-6146	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
11083 Highway D	Louisiana	MO	63353

3. OWNER

NAME		TELEPHONE NUMBER WITH AREA CODE	
Hercules LLC		(614) 790-6146	
EMAIL ADDRESS			
jevondracek@ashland.com			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
Atrium II - North Tower, Suite 500, 5475 Rings Road	Dublin	OH	43017

4. CONTINUING AUTHORITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
Hercules LLC		(614) 790-6146	
EMAIL ADDRESS			
jevondracek@ashland.com			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE
Atrium II - North Tower, Suite 500, 5475 Rings Road	Dublin	OH	43017

5. OPERATOR CERTIFICATION

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE	
Not Applicable (No active operations)			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE NUMBER WITH AREA CODE
James Vondracek	Principal Remediation Engineer	(614) 790-6146
E-MAIL ADDRESS		
jevondracek@ashland.com		

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

NAME			
Not applicable			
ADDRESS	CITY	STATE	ZIP CODE

8. ADDITIONAL FACILITY INFORMATION

8.1 Legal Description of Outfalls. (Attach additional sheets if necessary.) See Table 1 for description of monitoring wells.
For Universal Transverse Mercator (UTM), use Zone 15 North referenced to North American Datum 1983 (NAD83)

001 NA 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 ____ ¼ Sec ____ T ____ R ____ ____ County
UTM Coordinates Easting (X): ____ Northing (Y): ____

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 NA and NAICS NA 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? 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
James E. Vondracek Remediation Project Manager	614.323.5448
SIGNATURE James E Vondracek	DATE SIGNED January 5, 2022

MO 780-1479 (04-21)

Attachments:

Table 1 Monitoring Well Summary
Figure 1 Site Location Map
Figure 2 Monitoring Well Location Map

Tables

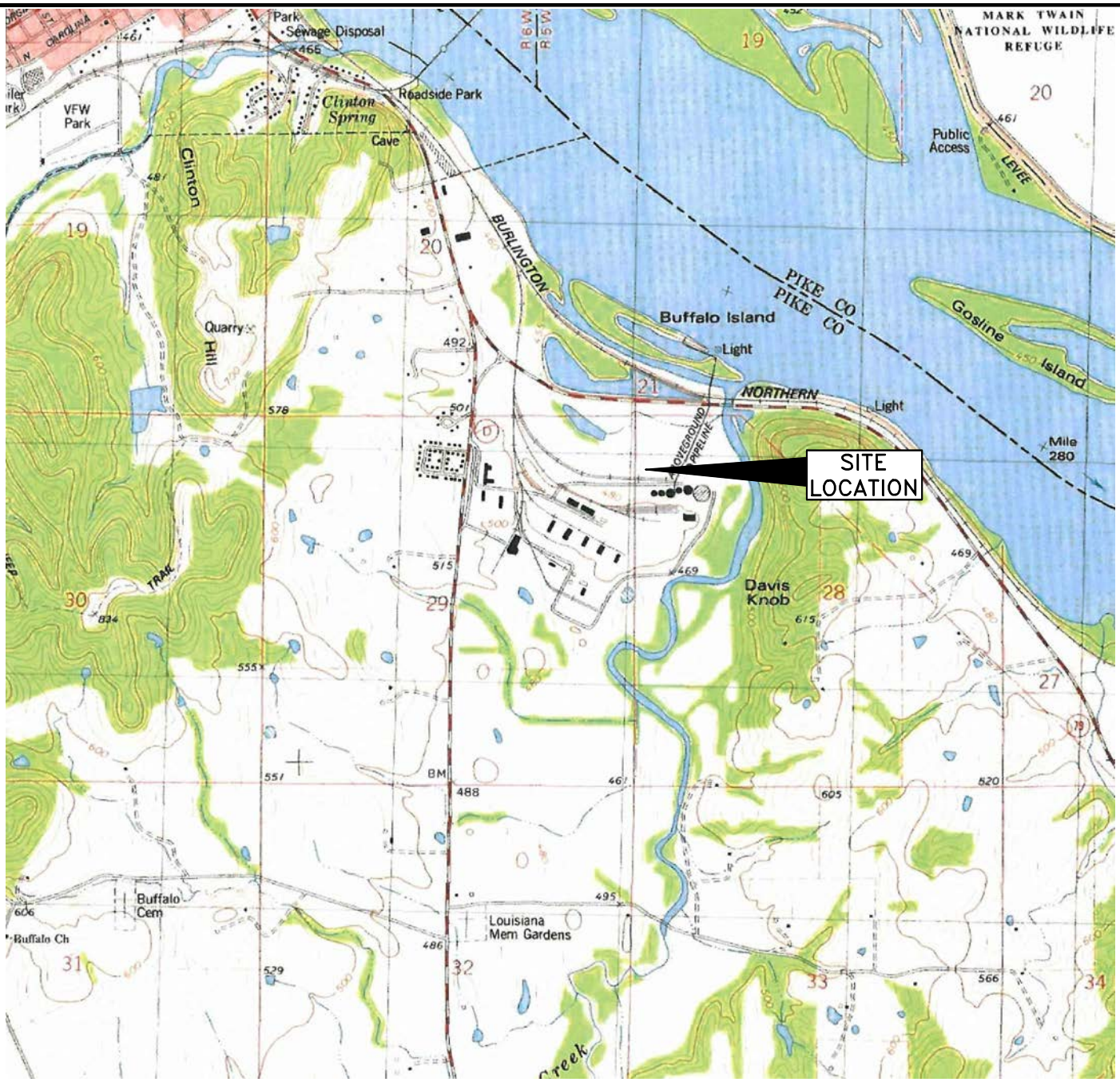
Table 1
Monitoring Well Construction Details
Missouri Chemical Works
Lousiana, Missouri

ARCADIS

Well ID	Date Installed	Land Surface (ft)	Top of Casing Elevation (ft)	Northing	Easting	Diameter (inches)	Total Depth (ft)	Screen Length (ft)	Top Screened Interval (ft bgs)	Bottom Screened Interval (ft bgs)	Mid Point Screen for Pump/ Tubing (ft bgs)	Top Screened Elevation (ft NGVD29)	Bottom Screened Elevation (ft NGVD29)	Hydraulic Unit Monitored	Location Relative to Ash Ponds
MW-1	08/22/11	462.31	462.31	1310175.32	671635.87	2	19.6	10	9.6	19.6	15	452.71	442.71	Shallow	Downgradient
MW-2	08/22/11	462.15	462.15	1309987.36	672143.62	2	19.0	10	9.0	19.0	15	453.15	443.15	Shallow	Downgradient
MW-3	08/22/11	461.98	461.98	1309699.76	672741.34	2	19.0	10	9.0	19.0	15	452.98	442.98	Shallow	Downgradient
MW-4	08/23/11	460.33	460.33	1309768.52	673158.08	2	15.0	10	5.0	15.0	10	455.33	445.33	Shallow	Downgradient
MW-6	07/19/12	467.20	467.20	1308904.39	673240.08	2	19.5	10	9.5	19.5	15	457.70	447.70	Shallow	Downgradient
MW-7	11/14/12	503.03	503.03	1308839.96	670713.91	2	35.0	10	25.0	35.0	30	478.03	468.03	Shallow	Upgradient
IP-1	07/20/12	463.50	463.50	1310116.62	671892.01	2	44.5	5	39.5	44.5	42	424.00	419.00	Intermediate	Downgradient
IP-4	07/19/12	459.82	459.82	1309755.92	673115.47	2	40.0	5	35.0	40.0	37	424.82	419.82	Intermediate	Downgradient
IP-6	07/20/12	466.63	466.63	1308908.34	6373237.29	2	44.0	5	39.0	44.0	41	427.63	422.63	Intermediate	Downgradient
IP-7	11/13/12	502.98	502.98	1308836.58	670718.29	2	86.0	5	81.0	86.0	83	421.98	416.98	Intermediate	Upgradient

NOTES:
ft = Feet
bgs = below ground surface
ft NGVD29 = Feet Relative to National Geodetic Vertical Datum of 1929
MW-5 and IP-5 were plugged in 2012

Figures



SCALE 1:24 000

1 1/2 0 1

SCALE IN MILE

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE IN FEET

N

REFERENCE: USGS 7.5 MINUTE QUADRANGLE; LOUISIANA, MISSOURI, 1978

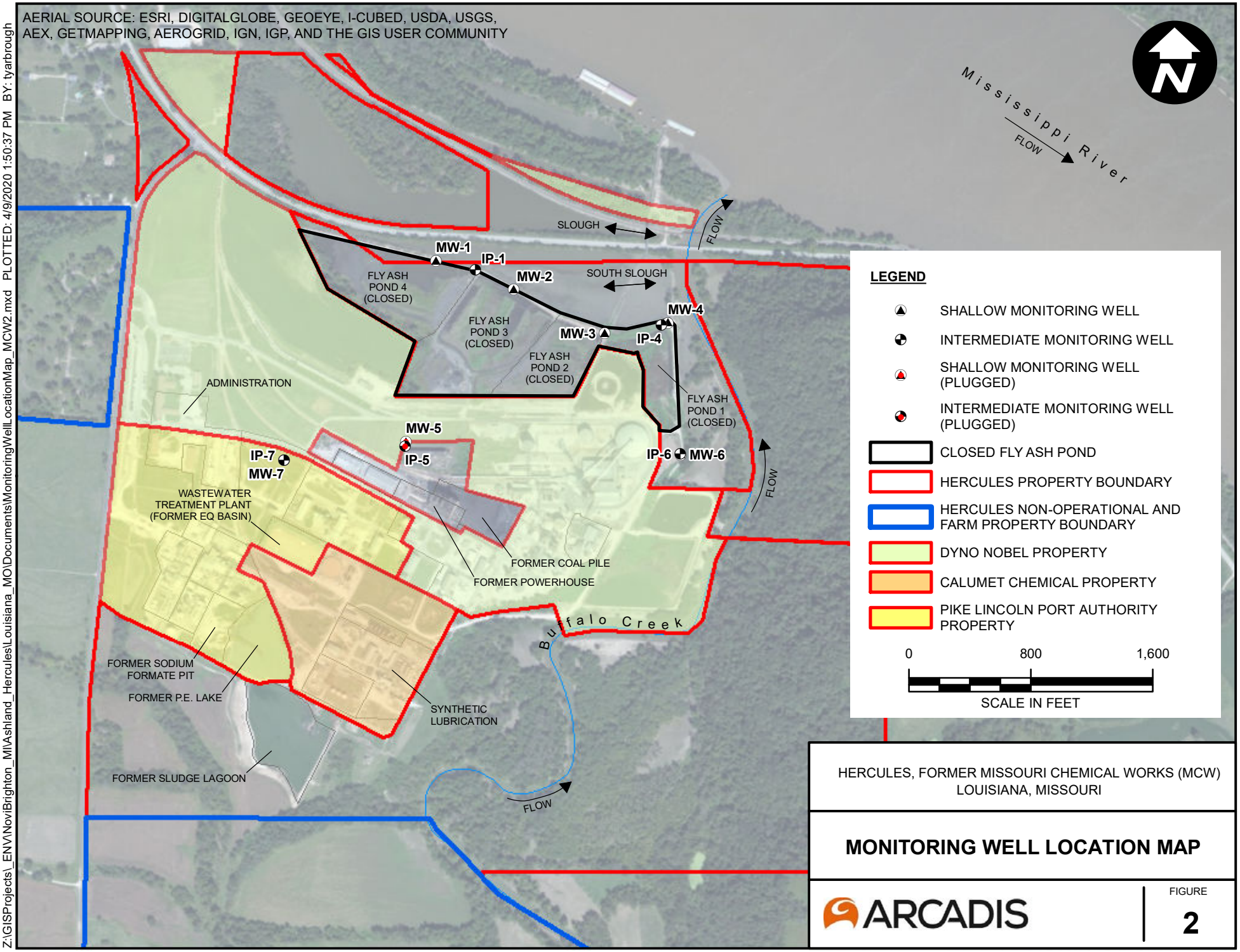
HERCULES, MISSOURI CHEMICAL WORKS (MCW)
LOUISIANA, MISSOURI

SITE LOCATION MAP

ARCADIS

FIGURE
1

XREFS:



CITY: BRIGHTON DIV: ENV DB: TRY PIC: PM: TM: TR: PROJECT NUMBER: OH009000.MO01
Z:\GISProjects_ENV\NoviBrighton_MI\Ashland_Hercules\Louisiana_MO\Documents\MonitoringWellLocationMap_MCW2.mxd PLOTTED: 4/9/2020 1:50:37 PM BY: tyarbrough

HERCULES, FORMER MISSOURI CHEMICAL WORKS (MCW)
LOUISIANA, MISSOURI

MONITORING WELL LOCATION MAP

ARCADIS

FIGURE
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