Pennsylvania Department of Environmental Protection

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Amendment, Major**	**NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER**	Application No.	**PA0008419 A-1**
Facility Type	**Industrial**		APS ID	**1128111**
Major / Minor	**Major**		Authorization ID	**1510842**

Applicant and Facility Information

Applicant Name	**Cherokee Pharmaceuticals, LLC**	Facility Name	**Cherokee Pharmaceuticals**
Applicant Address	100 Avenue C, P.O. Box 367	Facility Address	100 Avenue C, P.O. Box 367
	Riverside, PA 17868-0367		Riverside, PA 17868
Applicant Contact	Daniel Morris	Facility Contact	Daniel Morris
Applicant Phone	570-271-2187	Facility Phone	570-271-2187
Client ID	259313	Site ID	249423
SIC Code	2833,2834	Municipality	Riverside Borough
SIC Description	See Narrative	County	Northumberland
Date Application Received	December 26, 2024	EPA Waived?	No
Date Application Accepted	January 10, 2025	If No, Reason	Major Facility, Significant CB Discharge
Purpose of Application	The addition of Outfall 301 for the discharge of treated effluent from a new GWTS		

Summary of Review

INTRODUCTION

Cherokee Pharmaceuticals, LLC (Cherokee) has applied to amend its NPDES permit authorizing the treated industrial wastewater and stormwater discharge from the Riverside, PA Cherokee manufacturing facility. Due to the addition of a new outfall, the Department considers this a major amendment in accordance with 25 PA § 92a.72 and 92a.73 which, in turn, reference 40 CFR § 122.62 and 122.63 respectively.

APPLICATION

Cherokee submitted the *NPDES Application for Permit Amendment* (DEP #3800-PM-BCW0027b). This application was received by the Department on December 26, 2024 and considered administratively complete on January 10, 2025. Daniel Morris, Director, Safety& Environment, is both the client and site contact for Cherokee. His additional contact information is (fax) 570-271-4135 and (email) daniel.morris@merck.com. An additional Cherokee contact is Phillip Bahner, Safety and Environmental Specialist. His contact information is (phone) 570-271-2116 and (email) phillip.bahner@merck.com. The engineering consultant for this application is Bing Bai, Technical Engineering Consultant with ERM of Raleigh, NC. His contact information is (phone) 970-412-1229 and (email) bing.bai@erm.com.

PUBLIC PARTICIPATION

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

CONTINUED on the next page.

Approve	Return	Deny	Signatures	Date
X			Jeffrey J. Gocek, EIT Project Manager	03/03/2025
X			Nicholas W. Hartranft, PE Environmental Engineer Manager	03/03/2025

Summary of Review

The case file, permit application package and draft permit will be available for public review at Department's Northcentral Regional Office. The address for this office is 208 West Third Street, Suite 101, Williamsport, PA 17701. An appointment can be made to review these materials during the comment period by calling the file coordinator at 570-327-3636.

FACILITY BACKGROUND

Cherokee, a division of Merck Sharp and Dohme Corporation, is a pharmaceutical manufacturing plant located in Riverside, PA across the Susquehanna River from Danville. The site consists of 323 acres, 127 of which are inside the fence line. The site contains approximately 100 buildings and employs approximately 340 employees. From 1965 to 2007, Merck and Co., Inc. (Merck) owned and operated the Riverside manufacturing facility. In 2008 Merck sold this facility to Cherokee and in 2010 re-acquired the facility from Cherokee. This plant makes pharmaceutical active ingredients using chemical synthesis processes. The chemical synthesis process products are Cilastatin, Ertapenem and Imipenem. The applicable Standard Industrial Classification (SIC) codes are 2833 (Medicinal Chemicals and Botanical Products) and 2834 (Pharmaceutical Preparations).

See Attachment 01 for a map of the site. See Attachment 02 for a map of the outfalls.

An announcement was made by Cherokee in May 2022 informing the public that production at the Riverside facility would cease in 2024. The discontinuation of the active pharmaceutical ingredient manufacturing will lead to the ultimate closure of the facility. Cherokee plans to close the facility in a phased approach over several years. The decommissioning of the facility is projected to occur during 2025 and 2026

RECENT NPDES RENEWAL

This permit was recently renewed on August 12, 2024. This permit established effluent limitations and monitoring for Outfalls 001, 101, 201, 002 and 003. Outfall 001 contains Outfalls 101 and 201 as well as two sources of non-contact cooling water, industrial stormwater and steam distillate/condensate return. Outfall 101 contains chemical synthesis wastewater, groundwater remediation wastewater, cooling tower blowdown, boiler system wastewater, belt filter press wash water and de-ionized water production wastewater. Outfall 201 contains potable water treatment wastewater. Outfalls 002 and 003 contain stormwater.

The permit also includes special conditions regulating Chesapeake Bay Nutrient Requirements, Whole Effluent Toxicity, Chemical Additives, Industrial Stormwater, and Cooling Water Intake Structures. This permit will expire August 31, 2029.

PROJECT PROPOSAL

As mentioned earlier, the wastewater flow from the groundwater contamination site has always been conveyed to the onsite industrial wastewater treatment facility (IWTF). With the plans to cease production and decommission the IWTF, Cherokee has proposed the design, construction, and operation of a new groundwater conveyance system (GWCS) and a stand-alone groundwater treatment system (GWTS).

Cherokee has historically operated a groundwater remediation system under the Hazardous and Solid Waste Amendments (1984, of the Resource Conservation and Recovery Act (RCRA)) permit #PAD003043353 issued by the EPA. The existing remediation system was installed pursuant to a Consent Order and Agreement (CO&A) with the PADEP dated May 17, 1983, and revised December 08, 1992. This GWCS collects Volatile Organic Compound (VOC) impacted groundwater from six recovery wells at three onsite source areas (two tank farms and a former solvent recovery area) and conveys that impacted groundwater to the onsite IWTF. A pump is utilized to convey the groundwater to the onsite gravity chemical sewer. The existing recovery wells consist of five vertical recovery wells and one horizontal recovery well, which will continue to be utilized in the future to extract the impacted groundwater. This groundwater will be conveyed below grade with leak detection double wall piping to the proposed GWTS to be housed in the existing onsite building 227A. Two lift stations will be utilized to convey the extracted groundwater from the recovery wells to the GWTS.

The GWTS will primarily consist of an oil water separator (OWS, residual oil and grease removal), a greensand filtration system (inorganic removal), a duplex bag filtration system (fine suspended solid removal) and Liquid-Phase Granular Activated Carbon (LGAC) vessels (VOCs removal). Liquid sludge from the greensand filtration system will be pumped into a storage tank for processing via the filter press. Dry cake from the filter press will be disposed of offsite. Recovered liquid from the filter press will be pumped back to the OWS. Upon completion of the treatment train process, the treated groundwater will be drained by gravity to existing below grade stormwater system pipes which also drain by gravity to Outfall 001 for discharge to the Susquehanna River.

See Attachment 03 for the location of the building 227A. See Attachment 04 for the process flow diagram of the GWCS and the GWTS.

The GWTS will have an average design flow of 0.06 MGD, a maximum flow of 0.15 MGD and a peak flow of 0.17 MGD.

CONTINUED on the next page.

Summary of Review

OUTFALL 301

This major permit amendment deals only with the addition of Outfall 301.

Outfall 003 will be located at latitude 40°57'40.97" and longitude - 76°38'20.49". This outfall will be an internal outfall, tributary to Outfall 001 which discharges to the Susquehanna River. Outfall 001 discharges to the Susquehanna River at River Mile 135.66.

See Attachment 02 for the location of Outfall 003.

$Q_{7,10}$ DETERMINATION

The $Q_{7,10}$ is the lowest seven consecutive days of flow in a 10-year period and is used for modeling wastewater treatment plant discharges. 25 PA § 96.1 defines the $Q_{7,10}$ as the "actual or estimated lowest seven consecutive day average flow that occurs once in 10 years for a stream with unregulated flow, or the estimated minimum flow for a stream with regulated flow".

A stream gage just upstream of the discharge, *Susquehanna River at Danville, PA* (USGS #01540500) was selected as a reference gage. A $Q_{7,10}$ flow for that gage was obtained from *Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania (USGS Open File Report 2011-1070)*. Knowing the drainage area at the discharge (11,272 mi^2) and both the drainage area (11,220 mi^2) and $Q_{7,10}$ (1,120 CFS) at the reference gage, the $Q_{7,10}$ at the discharge was calculated to be 1,125 CFS. The drainage area at the discharge was obtained from the USGS StreatmStats application located at http://water.usgs.gov/osw/streamstats/pennsylvania.html.

RECEIVING STREAM

Characteristics

The receiving stream is the Susquehanna River, considered the North Branch or Main Stem. According to 25 PA 93.9k, this stream is protected for Warm Water Fishes (WWF) and Migratory Fishes (MF). These are the streams *Designated Uses*, which is defined in 25 PA § 93.1 as "those uses specified in §§ 93.9a – 93.9z for each waterbody or segment whether or not the use is being attained". Designated uses are regulations promulgated by the Environmental Quality Board (EQB) throughout the rulemaking process. This stream currently has no *Existing Use*, which is defined in 25 PA § 93.1 as "those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the water quality standards".

The Department stream code for this waterbody is 06685. The discharge is located in drainage basin K (Chapter 93), in State Water Plan watershed 5E (Catawissa and Roaring Creeks) and at River Mile 135. The nearest downstream public water supply intake is the Sunbury Municipal Authority, located 12 river miles downstream on the Susquehanna River.

Impairment

According to the latest Department impairment data, the Susquehanna River is not attaining its designated uses for Fish Consumption. It is impaired by Polychlorinated Biphenyls (PCBs) and Mercury from unknown sources. The Susquehanna River is also not attaining its designated uses for Aquatic Life. It is impaired by Siltation from Agriculture, Aluminum and Iron from Acid Mine Drainage.

UNTREATED GROUNDWATER CHARACTERISTICS

Cherokee submitted the Module 2 (Groundwater Remediation Systems) of the NPDES IW Application, as instructed by the Department. This module is used to describe the groundwater remediation system and report sample results of parameters believed to be present and those on the form believed to be absent from the wastewater. In this case, results from the untreated groundwater were provided. Cherokee reported detectable concentrations of Benzene, Toluene, Oil and Grease, Dissolved Iron, Dissolved Lead, Dissolved Mercury, Tricholorethylene, Vinyl Chloride, pH and Total Suspended Solids from the form. Cherokee also added detectable concentrations from additional parameters of 1,2-Dichloroethane, Bromobenzene, Carbon Tetrachloride, Chlorobenzene, Chloroform, Cis-1,2-Dichloroethene, Ethyl Ether, Methylene Chlroide, n-Hexane and Tetrahydrofuran.

See Attachment 05 for the list of pollutants from Cherokee.

CONTINUED on the next page.

Summary of Review

DEVELOPMENT OF EFFLUENT LIMITATIONS

Outfall 301 is modeled as if it discharges to the Susquehanna River, since the flow will be combined with other waste streams prior to discharge.

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Parameter (mg/L)	Limit	SBC	Federal Regulation	State Regulation
pH (SU)	6.0 – 9.0	Min - Max	133.102(c)	95.2(1)
Oil & Grease	15	Monthly Average		95.2(2)(ii)
Dissolved Iron	7.0	Monthly Average		95.2(4)

Water Quality-Based Limitations

Toxics Screening Analysis

Maximum pollutant concentrations were entered into the Department's Toxics Management Spreadsheet (TMS, Version 1.4). The TMS is used to determine reasonable potential (RP) and calculate water quality-based effluent limitations (WQBELS) for discharges of toxic pollutants from a single discharge point. The TMS utilizes the following logic to assign either no action, effluent limitation or monitoring; 1. Establish average monthly, daily maximum and IMAX limits in the draft permit where the maximum reported concentration exceeds 50% of the WQBEL (RP is demonstrated), 2. Establish monitoring requirements for non-conservative pollutants where the maximum reported concentrations is between 25% to 50% of the WQBEL and 3. Establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% to 50% of the WQBEL.

The TMS recommended the following monitoring and limitations.

	Mass Limits (lbs/day)		Concentration (ug/L)					
Pollutants	**AML**	**MDL**	**AML**	**MDL**	**IMAX**	**WQBEL**	**Basis[1]**	**Comment**
Dissolved Iron	Report	Report	Report	Report	Report	157,136	THH	Conc > 10% WQBEL – No RP
Benzene	1.66	2.59	1,327	2,070	3,316	1,327	CRL	Conc ≥ 50% WQBEL – RP

[1] AFC = Acute Fish Criteria, CFC = Chronic Fish Criteria, CRL = Cancer Risk Level, THH = Threshold Human Health

See Attachment 06 for the TMS output.

Best Professional Judgment (BPJ) Limitations

In the absence of applicable effluent guidelines for the discharge or pollutant, permit writers must identify and/or develop needed technology-based effluent limitations (TBELs) TBELs on a case-by-case basis, in accordance with the statutory factors specified in the Clean Water Act.

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)

Anti-Backsliding

In order to comply with 40 CFR § 122.44(l)(1) (anti-backsliding requirements), the Department must issue a renewed permit with limitations as stringent as that the of the previous permit.

No less stringent limitations have been proposed for this draft.

DEVELOPMENT OF EFFLUENT MONITORING

TMDL Metals

Since the receiving stream is impaired for both Aluminum and Iron, annual monitoring will be established to ensure the effluent is not contributing to the existing impairment.

CONTINUED on the next page.

Summary of Review

OPERATION AND MAINTENANCE

The Water Quality Management (WQM) permit will contain a special condition requiring Cherokee to have an Operation and Maintenance (O&M) Plan for the proposed GWTS. This plan will ensure proper O&M of the treatment units, especially the greensand filtration system and the LGAC vessels, which contain filter media needing routine replacement.

SAMPLE FREQUENCIES

The sample type and minimum measurement frequencies for parameters with limitations are in accordance with the *Department's Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits* (#362-0400-001).

PROPOSED EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

All existing limitations, for the earlier described outfalls, established at the last issuance/renewal remain the same.

The limitations and monitoring requirements specified below are proposed for the draft permit and reflect the most stringent limitations amongst technology, water quality and BPJ.

Outfall 301, Effective Period: Permit Effective Date through Permit Expiration Date

Discharge Parameter	Mass Limits (lb/day)		Concentrations (mg/L unless noted)				Monitoring Requirements	
	Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	IMAX	Minimum Measurement Frequency	Required Sample Fs Type
Flow (MGD)	Report	Report					1/Day	Metered
pH			6.0 Instant. Min.			9.0	1/Day	Grab
Oil & Grease				15		30	1/Day	Grab
Total Suspended Solids				30	60	75	1/Week	24 Hour Composite
Dissolved Iron				Report	Report	7.0	1/Week	24 Hour Composite
Benzene	1.66	2.59		1.32	2.07	3.31	1/Week	24 Hour Composite
Total Aluminum	Report Annual Ave.	Report		Report Annual Ave.	Report		1/Year	24 Hour Composite
Total Iron	Report Annual Ave.	Report		Report Annual Ave.	Report		1/Year	24 Hour Composite

END of Fact Sheet

ATTACHMENT 01

AECOM

625 West Ridge Pike, Suite E-100
Conshohocken, PA 19428
Phone: (215) 367-2500 Fax: (215) 367-1000

Cherokee Pharmaceuticals, LLC
Cherokee Pharmaceutical Facility
Topographic Location Map

0 0.75 1.5 3 4.5 6 Miles

1 in = 3 miles

Legend

- Intake
- Cherokee Facility

Job: 60652054

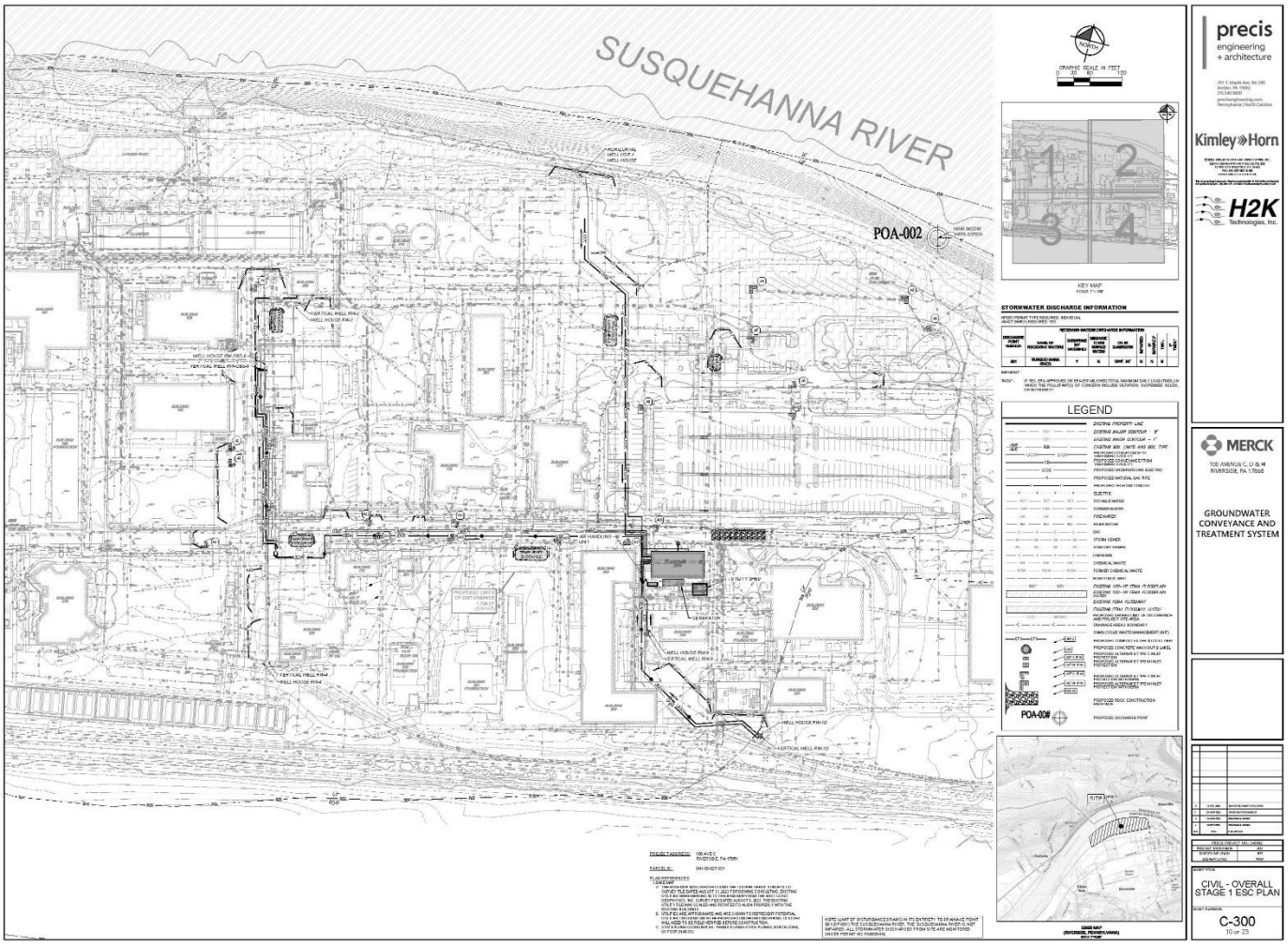
Prepared by: MT

Checked by:

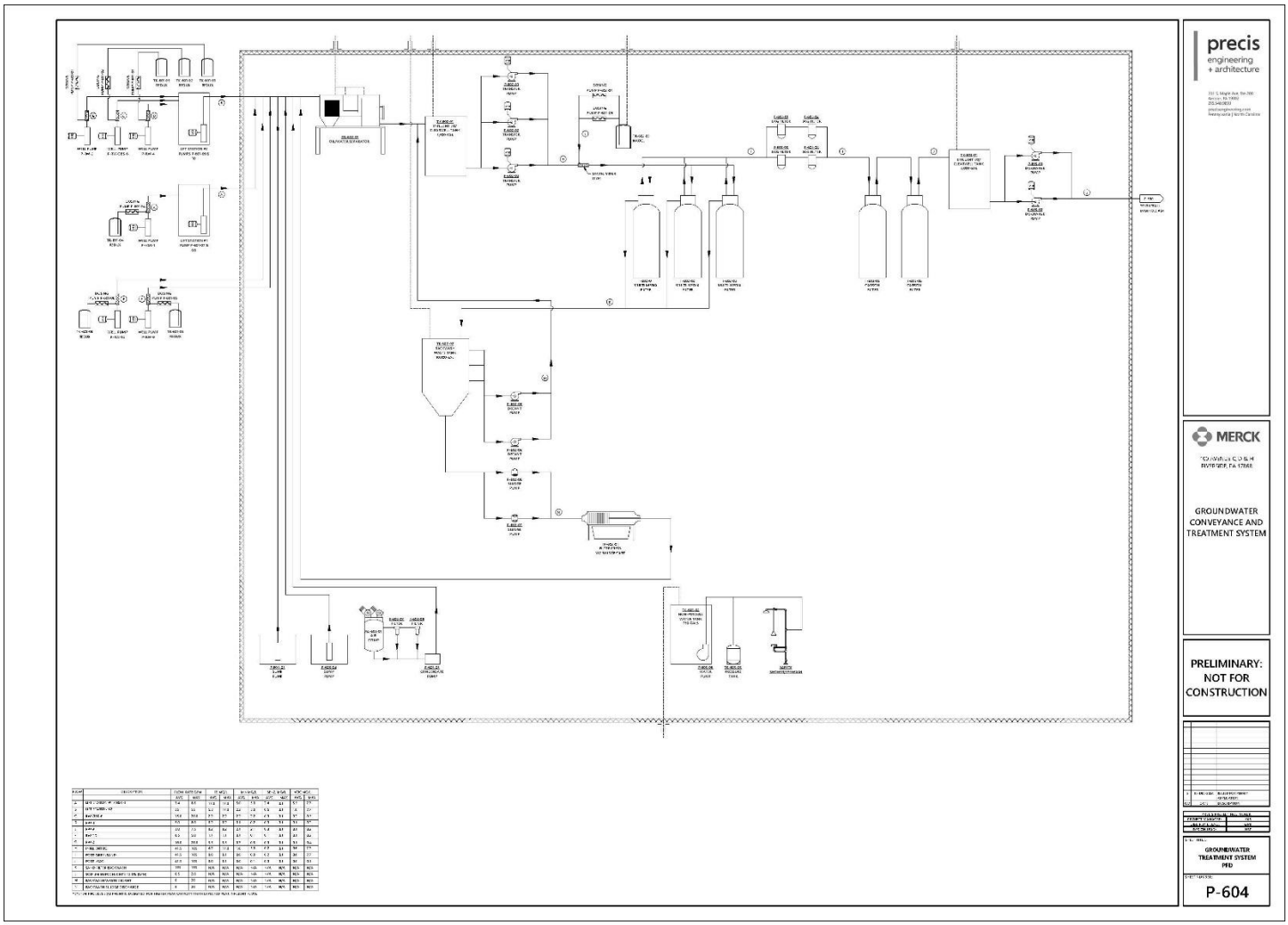
Date: 2/26/2021

ATTACHMENT 02

ATTACHMENT 03



ATTACHMENT 04



ATTACHMENT 05

3800-PM-BCW0008e Rev. 12/2023
Module 2

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

RECEIVED
DEC 26 2024
CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM APPLICATION FOR INDIVIDUAL PERMIT TO DISCHARGE INDUSTRIAL WASTEWATER

MODULE 2 – GROUNDWATER REMEDIATION SYSTEMS

1. **Applicant/Operator Name:**	**Cherokee Pharmaceuticals LLC**
2. Type of groundwater contamination:	☐ Gasoline ☐ Petroleum Products Other Than Gasoline ☒ Chlorinated Organics ☐ Other (Describe:)
3. Tanks Facility ID (if applicable):	**N/A**

4. Provide a detailed description of the existing or proposed groundwater treatment system. (Attach a design engineer's report for new systems).

The site currently operates a groundwater collection and conveyance system that collects water from six recovery wells and directs the water, along with other facility wastewater, to an industrial wastewater treatment plant (WWTP). From the WWTP, the water is treated and then discharged to the Susquehanna River. The existing WWTP will be demolished after Merck ceases manufacturing operations. Therefore, a new groundwater treatment system (GWTS) is required to be constructed along with a new groundwater conveyance system (GWCS). The proposed GWCS comprises of underground double-walled schedule 80 Chlorinated polyvinyl chloride (CPVC) piping and two lift stations. The proposed GWTS is to be housed in an existing building onsite and will consist of sludge removal, greensand filtration, bag filtration, and Carbon filtration. The proposed GWCS and GWTS are described in detail in the design engineer's report attached.

5. Identify the approximate date the treatment system began or will begin operating, and approximately how long it is expected to continue operating.

The proposed GWTS and GWCS are expected to begin operating by the first quarter in 2026. The objective of the proposed GWTS and GWCS is to be suitable for a design duration of 30 years.

6. Identify the methods that are or will be used for the management/disposal of backwash and system cleaning wastewaters.

A cone-bottom tank will accept backwash waste from the greensand filters and will include a level transmitter in the tank for level monitoring. There will be a one-hour minimum settling hold time, after which, water will be decanted back to the influent tank. Settled sludge will be routinely pumped out with a vacuum track or processed through a filter press which may be added in the future.

7. Provide background information on the cause(s) of groundwater contamination and any history of regulatory involvement.

Cherokee operates 6 recovery wells to provide hydraulic capture of the 18 volatile organic compounds from 3 onsite sources areas (2 tanks farms and the former solvent recovery area) as required in the United States Environmental Protection Agency (EPA) Permit Renewal and Third Modification for Corrective Action and Waste Minimization Under the Hazardous and Solid Waste Amendments of 1984 (HSWA Permit) (PAD003043353). The permit requires the operation of a groundwater remediation system until groundwater at the facility meets EPA drinking water standards or EPA-approved Alternantive Concentration Limits at the facility boundary and throughout the plume. The list of 18 volatile organic compounds (VOCs) in the sample results table are the 18 VOCs that require treatment per the HSWA permit and that list of VOCs is based on the investigations summarized in the key documents including the RCRA Facility Investigation Report (RFI) (which EPA approved on January 23,1998), the November 3, 2006 Statement of Basis (SB), and the April 25, 2007 Final Decision and Response to Comments (FDRTC).

8. Indicate whether any additives (chemical or biological) are or will be introduced into groundwater or the remediation system to improve treatment; identify the names of all additives, the location(s) and frequency of introduction, and the amount (lbs or gallons) of additives introduced.

Greensand media will require dosing with sodium hypochlorite or potassium permanganate upstream of the filters to maintain the ability to oxidize and capture dissolved iron and manganese. Dosing pumps will modulate flow rate based on process water flow through the filters and will provide continuous delivery into the system. The estimated dosing rates can be found in the design engineer's report. Oxidant will be supplied from 330-gallon Intermediate Bulk Containers (IBC) totes.

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Module 2

Applicant Name: Cherokee Pharmaceuticals LLC

SAMPLE RESULTS

Outfall No.:	Groundwater Wells	☐ Treated Groundwater	☒ Untreated Groundwater

Parameter	Believed Absent	Avg (mg/L)	Max (mg/L)	No. Samples	No. Detected	Quantitation Limit (mg/l)
Benzene	☐	0.750	2.500	18	8	0.001
Toluene	☐	0.285	1.100	18	6	0.001
Ethylbenzene	☒					
Total Xylenes	☒					
MTBE	☒					
Oil and Grease	☐	3.1	5.3	6	2	5.3
Dissolved Iron	☐	3.200	18.000	9	9	0.210
Dissolved Lead	☐	0.015	0.015	6	6	0.015
Dissolved Mercury	☐	0.0002	0.0002	6	6	0.0002
Trichloroethylene	☐	0.003	0.0051	18	7	0.001
Tetrachloroethylene	☒			18	0	0.001
Vinyl Chloride	☐	0.001	0.0016	18	2	0.001
Naphthalene	☒					
Benzo(a)anthracene	☒					
Benzo(b)fluoranthene	☒					
Benzo(a)pyrene	☒					
Benzo(g,h,i)perylene	☒					
Indeno(1,2,3-cd)pyrene	☒					
Pyrene	☒					
Cumene	☒					
Phenanthrene	☒					
Chrysene	☒					
PFOA	☒					
PFOS	☒					
PFBS	☒					
HFPO-DA	☒					
pH (S.U.)	☐	6.80	7.41	18	18	
Total Suspended Solids	☐	5.9	27	9	6	3.0
Other: **Acetone**	☒			18	0	0.020
Other: **1,2-Dichloroethane**	☐	0.012	0.060	18	8	0.001
Other: **Acetonitrile**	☒			18	0	0.100
Other: **Bromobenzene**	☐	0.002	0.003 J	18	2	0.005
Other: **Carbon tetrachloride**	☐	0.002	0.0017	18	3	0.001
Other: **Chlorobenzene**	☐	0.347	1.900	18	15	0.001
Other: **Chloroform**	☐	0.001	0.003	18	8	0.001
Other: **Chloromethane**	☒			18	0	0.002
Other: **Cis-1,2-dichloroethene**	☐	0.001	0.0017	18	7	0.001
Other: **Ethyl Ether**	☐	0.056	0.4	18	15	0.005

3800-PM-BCW0008e Rev. 12/2023
Module 2

Applicant Name: Cherokee Pharmaceuticals LLC

SAMPLE RESULTS

Other: **Methylene Chloride**	☐	0.002	0.0019	18	1	0.001
Other: **n-Hexane**	☐	0.007	0.015	18	4	0.005
Other: **Tetrahydrofuran**	☐	0.056	0.14	18	5	0.010

ATTACHMENT 06

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Cherokee Pharmaceuticals** NPDES Permit No.: **PA0008419** Outfall No.: **301**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Groundwater Contamination (VOCs)**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.15	100	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	mg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L		18000									
	Total Iron	µg/L											
	Total Lead	µg/L											
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	mg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L		2500									
	Bromoform	µg/L	<										

Group 3	Carbon Tetrachloride	µg/L		1.7									
	Chlorobenzene	µg/L		1900									
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L		3									
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L		60									
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L		1.9									
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L		1100									
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L		5.1									
	Vinyl Chloride	µg/L		1.6									
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

	2,6-Dinitrotoluene	µg/L	<										
	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Cherokee Pharmaceuticals, NPDES Permit No. PA0008419, Outfall 301

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Susquehanna River**

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	006685	135.66	437	11272.34			Yes
End of Reach 1	006685	125.8	430	11290			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	135.66	0.1	1226									100	7		
End of Reach 1	125.8	0.1	1229.5												

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	135.66														
End of Reach 1	125.8														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Cherokee Pharmaceuticals, NPDES Permit No. PA0008419, Outfall 301

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.014 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	640	640	48,933	
Carbon Tetrachloride	0	0		0	2,800	2,800	214,082	
Chlorobenzene	0	0		0	1,200	1,200	91,750	
Chloroform	0	0		0	1,900	1,900	145,270	
1,2-Dichloroethane	0	0		0	15,000	15,000	1,146,870	
Methylene Chloride	0	0		0	12,000	12,000	917,496	
Toluene	0	0		0	1,700	1,700	129,979	
Trichloroethylene	0	0		0	2,300	2,300	175,853	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 720 PMF: 0.099 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	130	130	68,092	
Carbon Tetrachloride	0	0		0	560	560	293,321	
Chlorobenzene	0	0		0	240	240	125,709	
Chloroform	0	0		0	390	390	204,277	
1,2-Dichloroethane	0	0		0	3,100	3,100	1,623,743	
Methylene Chloride	0	0		0	2,400	2,400	1,257,092	
Toluene	0	0		0	330	330	172,850	
Trichloroethylene	0	0		0	450	450	235,705	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 720 PMF: 0.099 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Dissolved Iron	0	0		0	300	300	157,136	
Benzene	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	52,379	
Chloroform	0	0		0	5.7	5.7	2,986	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	29,856	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 720 PMF: 0.143 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	0.58	0.58	1,327	
Carbon Tetrachloride	0	0		0	0.4	0.4	915	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	9.9	9.9	22,642	
Methylene Chloride	0	0		0	20	20.0	45,742	
Toluene	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	0.6	0.6	1,372	
Vinyl Chloride	0	0		0	0.02	0.02	45.7	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

Pollutants	*Mass Limits* AML (lbs/day)	*Mass Limits* MDL (lbs/day)	*Concentration Limits* AML	*Concentration Limits* MDL	*Concentration Limits* IMAX	*Concentration Limits* Units	Governing WQBEL	WQBEL Basis	Comments
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	157,136	THH	Discharge Conc > 10% WQBEL (no RP)
Benzene	1.66	2.59	1,327	2,070	3,316	µg/L	1,327	CRL	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Carbon Tetrachloride	915	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	52,379	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroform	2,986	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloroethane	22,642	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	45,742	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	29,856	µg/L	Discharge Conc ≤ 25% WQBEL
Trichloroethylene	1,372	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	45.7	µg/L	Discharge Conc ≤ 25% WQBEL