National Pollutant Discharge Elimination System Permit Factsheet

SECTION 1 FACILITY SUMMARY

APPLICANT	Wieland Rolled Products North America, LLC
PERMIT NO.	CT0021873
APPLICATION NO.	201406851
DATE APPLICATION RECEIVED	June 19, 2014
LOCATION ADDRESS	215 Piedmont Street, Waterbury, CT 06706
FACILITY CONTACT	Dean Stoddart Office Phone: (203) 346-6362 Email: Dean.Stoddart@wieland.com
MAILING ADDRESS	215 Piedmont Street, Waterbury, CT 06706
DMR CONTACT	Dean Stoddart Office Phone: (203) 346-6362 Email:Dean.Stoddart@wieland.com
SECRETARY OF STATE BUSINESS ID	0917906
PERMIT TERM	5 Years
PERMIT CATEGORY	National Pollutant Discharge Elimination System ("NPDES") Major ("MA")
SIC & NAICS CODE(S)	SIC: 3351 (primary), 3316, & 3356 NAICS: 331420, 331221, & 331491
APPLICABLE EFFLUENT GUIDELINES	40 Code of Federal Regulations ("CFR") 433 and 468
PERMIT TYPE	Reissuance
OWNERSHIP	Private
RECEIVING WATER	Naugatuck River
WATERBODY SEGMENT ID'S	CT6900-00_03
WATERBODY CLASSIFICATION	B
DISCHARGE LOCATIONS (LAT, LONG)	DSN 001A: 41º 32′ 16.8", -73º 02′ 9.96"
COMPLIANCE SCHEDULE	Yes (Per- and Polyfluoroalkyl Substances sampling requirements)
DEEP STAFF ENGINEER	Oluwatoyin Fakilede (860-418-5986) Oluwatoyin.fakilede@ct.gov

TABLE OF CONTENTS

1.1 PERMIT FEES

Application Fee:

Filing Fee	Invoice No.: DEP236742	Amount: $1,300	Date Paid: 6/19/2014
Processing Fee	Invoice No.: DEP238310	Amount: $ 35,150	Date Paid: 9/12/2014

Annual Fee (per Regulations of Connecticut State Agencies ("RCSA") Sec. 22a-430-7 and General Statutes of Connecticut ("CGS") Sec. 22a-6f):

DISCHARGE CODE	WASTEWATER CATEGORY	FLOW CATEGORY (Gallons per day("gpd")	ANNUAL FEE
101035	Metal Finishing	257,000	$ 8,425.00
101017R	Copper forming	25,900	$ 1,685.00
1060000	Water Production	4,976	$ 660.00
101032X	Laboratory wastewater	100	$ 660.00
1080000	Incidental rainfall	24	$ 0
TOTAL AMOUNT			$11,430.00

1.2 APPLICATION SUBMITTAL INFORMATION

On June 19, 2014, the Department of Energy and Environmental Protection ("DEEP") received an application (Application No. 201406851) from GBC Metals LLC, now Wieland Rolled Products North America, LLC ("Permittee", "Applicant") located in Waterbury, CT 06706, for the renewal of NPDES permit CT0021873, expiring on December 17, 2014 ("the previous permit").

Consistent with the requirements of Section 22a-6g of the Connecticut General Statutes ("CGS"), the Applicant published a Notice of Permit Application in the Hartford Courant newspaper on February 6, 2014. On October 9, 2014, the application was determined to be timely and administratively sufficient.

The Permittee seeks authorization for the following in Application No. 201406851:

DSN	PROPOSED AVERAGE DAILY FLOW (gpd)	PROPOSED MAXIMUM DAILY FLOW (gpd)	PROPOSED WASTESTREAMS	TREATMENT TYPE	DISCHARGE TO
001A	192,000	288,000	Copper forming, metal finishing, deionized unit regeneration and laboratory wastewaters.	Equalization, two-stage neutralization, metal precipitation and clarification	Naugatuck River

1.3 OTHER PERMITS

The Applicant has other stormwater and wastewater discharges covered under different permitting mechanisms as follows:

- Stormwater from the site is permitted under the "General Permit for the Discharge of Stormwater Associated with Industrial Activity" (GSI002267).
- 14,490 gallons per day of metal finishing, contact cooling water, water treatment, solvent recovery and metal research laboratory wastewaters are permitted under Pretreatment Permit No. SP0001332.
- Miscellaneous wastewaters from the site, such as reverse osmosis reject wastewater, air compressor condensate, boiler blowdown, fire testing wastewater, and non-contact cooling wastewater (NCCW) are covered under the "General Permit for the Discharge of Wastewaters from Significant Industrial Users" (CTSIU0015).

1.4 FACILITY DESCRIPTION

The facility is located on an approximately 14.9-acre property. Most of the manufacturing operations are in Buildings 19-25, which encompass an area of over 145,000 square feet. The wastewater treatment plant is in Building 76. Additional buildings include trailers T3 and T4, and Buildings 01, 02, and 04. Buildings 03, 71, 75, and 78 are currently unoccupied and used for various document and unused equipment storage. Building 72 has been demolished.

1.5 FACILITY CHANGES

The Regulations of the Connecticut State Agencies ("RCSA") require that permittees notify DEEP and obtain written approval of any facility expansion or process change that may result in an increased or new discharge or constitute a new source, and of any expansion or significant changes made to a wastewater collection system, treatment system, or its method of operation in accordance with RCSA Section 22a-430-3(i). These regulatory provisions are commonly referred to as "3(i) determinations". DEEP will review the notification and determine if the change can be implemented under the current permit or if the requested change requires a permit modification to protect waters of the State in accordance with RCSA Section 22a-430-4(p).

The following are a list of 3(i) determinations since the previous permit:

Application No.	3(i) Approval issuance Date	Change Implemented
Application No. 202108372	September 1, 2021	Installation of a pH meter to the retention tank, which includes a Hach pH/Oxidation Reduction Potential ("ORP") sensor and SC200 controller, to enable confirmation that the wastewater from the plating operations is at the required pH.
		Installation of a check valve to the wastewater piping between the #2 secondary reactor tank (Unipure) and the holding tank to prevent reverse flow, because the #2 secondary reactor tank (Unipure) is at a higher elevation than the holding tank.
		Addition of an alarm to the pH controller that will alert the operator if pH is outside of the acceptable pH range.
		Installation of a transfer line from the #2 secondary clarifier (Unipure) to the sludge holding tank, to enable solids processing and removal through the sludge press.
Application No. 202209699	November 3, 2022	Installation of high-level alarms (float switch and auto dialer) to the 40,000-gallon retention tank, the 20,000-gallon holding tank and the 3950-gallon pit associated with the treatment system. The high-level alarms provide automatic notification to the facility's personnel to improve response time and allow prompt corrective actions such as re-directing or stopping the flow of wastewater.
Application No. 202212534	February 16, 2023	Installation of a 6-inch three-way ball valve with electronic actuator at the piping junction for recirculating wastewater and discharging treated wastewater. The change was needed to provide operators a way to open the recirculating piping and close the outfall piping simultaneously.
Application No. 202402040	March 25, 2024	Installation of a relay switch at the electronically actuated three-way ball valve that controls the discharge and recirculation of wastewater to provide better accuracy in discharge flow reporting.

1.6 DESCRIPTION OF INDUSTRIAL PROCESS

Wieland is a precision re-roll mill, producing specialty light gage copper and stainless-steel alloys. Wieland uses municipal water for its production operation at the facility. The production processes are as follows:

Acid Pickling – Plating Line #8 is used interchangeably for plating and acid pickling. When pickling occurs, the plating tank is drained and replaced with sulfuric acid. The material is first cleaned in a caustic solution and then rinsed. Then the material is treated with sulfuric acid and rinsed again. Lastly, there is an anti-tarnish treatment before the final rinse. The rinsewater drag out from the plating/pickling tanks and wastewater from the air scrubbers are directed to the #8 plating equalization tank.

Electroplating – This occurs in Plating Lines #7, #8, #9 and #10. The process includes cleaning the material in caustic solution and rinsing before the electroplating process. The rinsewater and drag-out from the plating tanks go to a separate equalization tank for each plating line. Spent rinsewater is then directed to the treatment system.

Laboratory Rinsewater – The laboratory is used for quality control from the plating process. Wastewater is generated from washing glassware in the laboratory sinks and discharged to the #8 plating equalization tank.

De-ionized Regeneration Wastewater – An ion exchange system is used to provide de-ionized water for the plating lines. The backwash from the ion exchange system drains to #10 plating line equalization tank.

1.7 TREATMENT SYSTEM DESCRIPTION

Process wastewater is discharged to the on-site wastewater treatment system through underground piping. The wastewater flows through an equalization tank, two-stage neutralization, metal precipitation and clarification prior to discharge to the Naugatuck River through the City of Waterbury's storm sewer.

The following is a description of the treatment system:

Pretreatment - The initial wastewater treatment step is performed at each plating area. The wastewaters from each of the four copper bond plating lines, overflow from the fume scrubber, and steam condensate from the heat exchanger associated with each line, are collected in a 2,000 gallon "destruct" tank located at each copper bond line. Sulfuric acid is added to the tanks to maintain a pH of approximately 2.5. These tanks are equipped with alarms to notify the treatment plant operator if the pH goes above 5. The flow from each "destruct" tank is continuously metered as it flows to the retention tank.

Equalization - Incoming wastewater from the manufacturing building flows into a 40,000-gallon retention tank where waste streams are combined and mixed in the tank with a recirculating pump for equalization. These tanks are equipped with alarms to notify the treatment plant operator if the pH goes above 5 standards units ("S.U."). The flow rate and water level are continuously monitored.

Neutralization - Neutralization of the wastewater consists of a two-stage process. Wastewater is pumped from the retention tank into the first stage neutralization tank, where lime is added to raise the pH to between 8 and 11 S.U. Wastewater then flows into the second stage neutralization tank, where air is pumped into the tank. Ferrous chloride is also added into the first tank at 175 mL/min to aid in settling during primary clarification.

Primary Clarification - Following the second stage neutralization tank, wastewater is directed to a lamella clarifier for primary clarification. A synthetic polymer (Amerfloc 285) is added to enhance clarification. A portion of the sludge generated in the primary clarifier is returned to the first neutralization tank for further treatment. The remaining sludge is pumped to a holding tank for solids.

Wastewater from the primary clarifier is usually directed to an uncovered outdoor holding tank, also referred to as the “swimming pool”, which is continuously monitored by a water level meter. When necessary, the wastewater may be manually redirected to an underground tank, known as “Pit”, when the water requires further treatment. In such cases, wastewater from the Pit flows back into the retention tank to repeat equalization, neutralization, and primary clarification. The Pit has an approximate capacity of 3,950 gallons and is an underground tank beneath the wastewater treatment plant. The Pit routinely receives water from the trenches in the wastewater treatment plant area. The trenches are used to collect wastewater generated by draining and cleaning wastewater treatment tanks and other housekeeping tasks.

Secondary Clarification - Wastewater is pumped to either the Parkson Reactor Tank (via pumps A & C) or the Unipure Reactor Tank (via pump B) from “swimming pool”. Both reactor tanks add ferrous chloride, lime, and air to the wastewater which is thoroughly mixed with a mechanical mixer. Water flows to the Parkson clarifier at up to 135 gallons per minute (“gpm”) and polymer (Amerfloc 285) is added at the rate of 600 to 700 mL/min to enhance clarification. Water flows to the Unipure clarifier at 40 to 70 gpm and the same polymer is added at the rate of 500 to 600 mL/min to enhance clarification. For secondary clarification and solids removal, water from the Parkson Reactor Tank flows to the Parkson Clarifier, and water from the Unipure Reactor Tank flows to the Unipure Clarifier. Typically, only the Parkson Reactor and Clarifier are used when flows are low. Sludge from the clarifiers is either pumped back to the first neutralization tank or to the solids holding tank.

Sludge Dewatering - A holding tank for solids is fed through a filter press before off-site disposal. Filtrate from the dewatering process is sent to the Pit, which then flows to the retention tank (equalization basin) and through the rest of the treatment process.

Treated Effluent Discharge - Treated effluent from the secondary clarifiers is discharged to the Naugatuck River via the City of Waterbury’s storm drain system. Prior to discharge, the treated effluent flows through a flow meter and a pH meter, each with chart recorders. If the pH is outside the target range, an alarm sounds at the discharge sampling location. The treated wastewater also flows through a turbidity meter. If the pH is outside of the target range or turbidity exceeds 15 Nephelometric Turbidity Units (NTU), the wastewater is manually redirected back to the Pit by gravity for further treatment.

1.8 COMPLIANCE HISTORY

Based on Wieland’s Discharge Monitoring Reports (“DMR”) data evaluated from January 2019 to December 2023, the Permittee reported the following effluent violations. The exceedances have been corrected.

Table 1.4: Effluent violations in the past 5 years

MONTH/ YEAR	DSN	PARAMETER	TYPE OF LIMIT	PERMITTED LIMIT	EXCEEDENCE
11/30/2019	001A	Aquatic toxicity, *Daphnia pulex*	MDL	70%	34.4%
2/28/2021	001A	Aquatic toxicity, *Daphnia pulex*	MDL	70%	38%
3/31/2024	001A	Aquatic toxicity, *Daphnia pulex*	MDL	70%	6.25%
3/31/2021	001A	Zinc, Total	MDL	1.91 mg/l	2.38 mg/l
1/31/2022	001A	Iron, Total	MDL	5.0 mg/l	7.6 mg/l

Table 1.4: Effluent violations in the past 5 years					
MONTH/ YEAR	**DSN**	**PARAMETER**	**TYPE OF LIMIT**	**PERMITTED LIMIT**	**EXCEEDENCE**
4/30/2022	001A	Total Suspended Solids	MDL	30 mg/l	38.5 mg/l
8/31/2022	001A	Total Suspended Solids	MDL	30 mg/l	37.5 mg/l

MDL: Maximum daily limit

The Permittee is not subject to an ongoing enforcement action but had undergone the following enforcement actions:

A Notice of Violation (NOV WR IN 18014) was issued on May 31, 2018, for the following.

1. Failure to maintain practices, procedures, and facilities designed to prevent, minimize, and control spills, leaks, or other unplanned releases from Wieland as required by Section 22a-430-3(p)(1) of the RCSA on December 5, 2014, February 17, 2015, February 23, 2015, January 26, 2016, June 11, 2017, July 11, 2017, and January 20, 2018.

2. Failure to notify the DEEP in accordance with the requirements of Sections 22a-430-3(j)(11)(D) and 22a-430-3(k)(4) of the RCSA for spill/bypass events cited above.

The notice of violation ("NOV") required Wieland to review, update, as needed, and submit their spill prevention and control plan, standard operating procedures, and updated operations and maintenance manual. The NOV was closed on July 27, 2023, when the Permittee obtained a consultant to manage on-site monitoring.

An Administrative Order (Docket No. CWA-AO-R01-FY19-05) was issued by the United States Environmental Protection Agency ("EPA") on April 18, 2019, for the following:

On four occasions from February 17, 2015, through June 11, 2017, Somers Thin Strip, now Wieland, discharged untreated or partially treated wastewater via an outfall of the City of Waterbury's Municipal Separate Storm System ("MS4") to the Naugatuck River without authorization of an NPDES permit.

The order required Wieland to submit a revised spill prevention, control, and countermeasure plan / spill prevention and control plan ("SPCC & SPC Plan") and a wastewater conveyance system asset management plan to EPA and DEEP. Wieland complied with the requirements and the administrative order was closed on February 25, 2020.

Previous NPDES Permit Compliance Schedule:
The previous permit issued on December 18, 2009, contained a compliance schedule that required the Permittee to submit a report of the results of chronic toxicity tests before December 31st of each calendar year. The Permittee complied and has submitted the results of chronic toxicity tests to DEEP annually.

The compliance schedule in the previous permit also required the Permittee to submit for the review and written approval of the Commissioner, plans and a schedule for the elimination of all direct non-contact cooling water discharges (NCCW) into surface waters (DSN 001-B) and to perform the elimination after approval. The Permittee has re-routed the NCCW, and the NCCW is now permitted under General Permit No. CTSIU0015 (see Section 1.3 of this fact sheet).

1.9 GENERAL ISSUES RELATED TO THE APPLICATION

1.9.1 FEDERALLY RECOGNIZED INDIAN LAND
As provided in the permit application, the site is not located on federally recognized Indian land.

1.9.2 COASTAL AREA/COASTAL BOUNDARY
The activity is not located within a coastal boundary as defined in CGS 22a-94(b).

1.9.3 ENDANGERED SPECIES
Based on a letter dated April 22, 2024, from DEEP's Bureau of Natural Resources, no extant populations of federal or state endangered, threatened or special concern species (RCSA Sec. 26-306) are known to occur within the project area associated with the wastewater discharge.

1.9.4 AQUIFER PROTECTION AREAS
As provided in the permit application, the site is not located within a protected area identified on a Level A or B map.

1.9.5 CONSERVATION OR PRESERVATION RESTRICTION
As provided in the permit application, the property is not subject to a conservation or preservation restriction.

1.9.6 PUBLIC WATER SUPPLY WATERSHED
As provided in the permit application, the site is not located within a public water supply watershed.

SECTION 2 RECEIVING WATER BODY INFORMATION
Wieland discharges into the Naugatuck River. The segment of the Naugatuck River is identified as CT6900- 00_03 and is a class "B" water. Class B waters are designated for: habitat for fish and other aquatic life and wildlife; recreation; and industrial and agricultural water supply. This waterbody segment is identified on the 2022 Integrated Water Quality Report as an impaired waterbody. There are two impaired designated uses associated with this waterbody: 1) An impairment to recreation due to *Escherichia coli* (*E. coli*) and 2) an impairment to the habitat for fish, other aquatic life, and wildlife with an unknown cause.
FINAL-2022-IWQR-Connecticut-305b-Assessment-Results-for-Rivers-and-Streams.pdf
FINAL-2022-IWQR-List-of-Impaired-Waters-for-Connecticut-EPA-Category-5.pdf

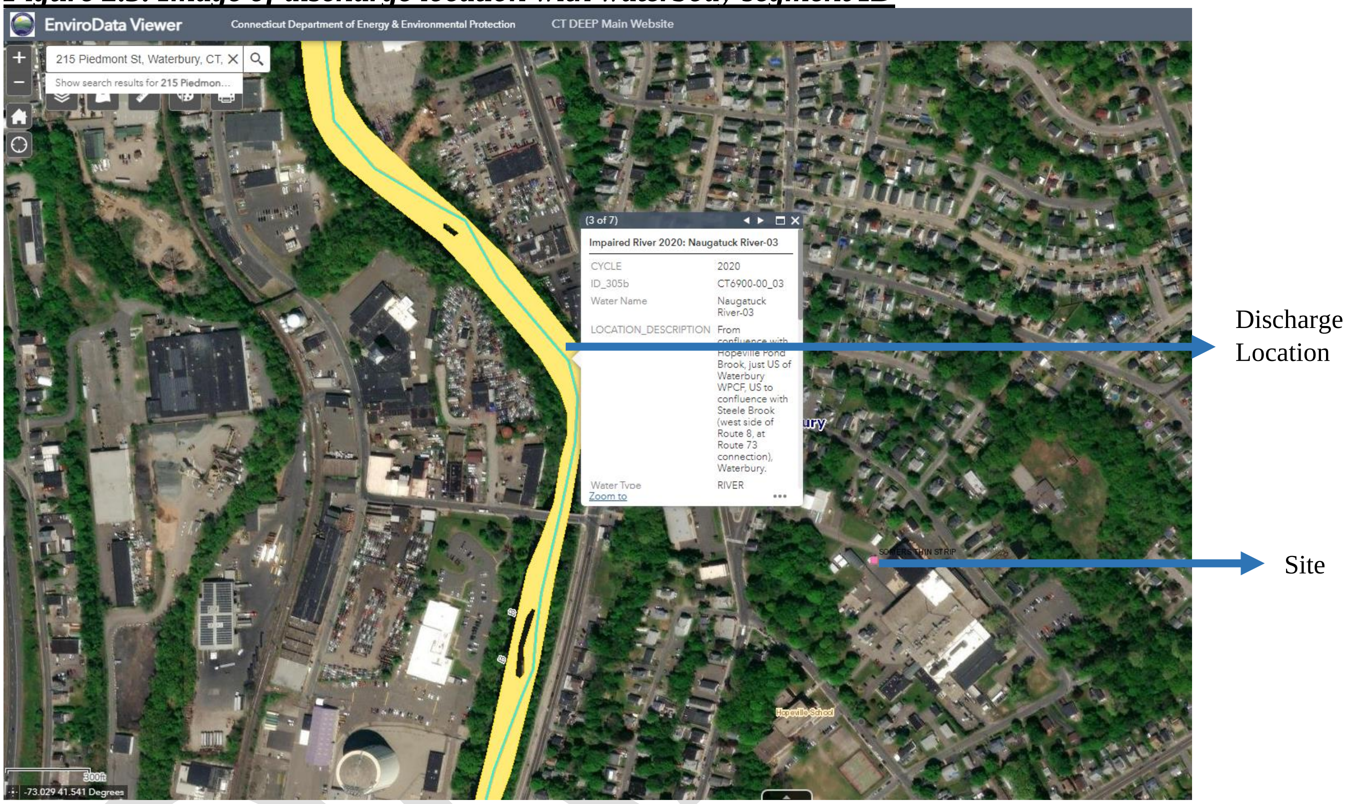
Figure 2.1. Image of Applicable Section of 2022 Connecticut Integrated Water Quality Report

Waterbody Segment ID	Waterbody Name	Location	Miles	Aquatic Life	Recreation
CT6900-00_03	Naugatuck River-03	From confluence with Hopeville Pond Brook, just US of Waterbury WPCF, US to confluence with Steele Brook (west side of Route 8, at Route 73 connection), Waterbury.	3.52	Not Supporting	Not Supporting

Figure 2.2. Image of Applicable List of impaired waters for Connecticut

Waterbody Segment ID	Waterbody Name	Cause	Impaired Designated Use
CT6900-00_03	Naugatuck River-03	CAUSE UNKNOWN	Habitat for Fish, Other Aquatic Life and Wildlife

Figure 2.3. Image of discharge location with waterbody segment ID



2.2 APPLICABLE TOTAL MAXIMUM DAILY LOAD (TMDL)

A TMDL for *Escherichia coli* (impairment to recreation) has been established for Naugatuck River, Segment ID CT6900-00_03 (approved by EPA on June 4, 2008) (Naugatuck River Regional Basin TMDL (epa.gov)). The discharge does not contain sanitary sewage and *E. coli* is not likely to be present in the discharge. Due to this, *E. coli* monitoring and limits are not incorporated into this permit.

"A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound" (December 2000) (Long Island Sound TMDL), based on control of nitrogen also applies to this segment of Thames River. However, the Permittee's discharge has not been assigned a waste load allocation for nitrogen as part of this TMDL. Nitrogen monitoring has been included in the permit due to the impairment.

Figure 2.4. Image of Applicable 2022 IWQR Waterbodies with Adopted TMDLs

Waterbody Segment ID	TMDL	Basin Number	Waterbody Name	Impaired Designated Use	Cause	EPA Approved	TMDL Link	Category/sub category
CT6900-00_03	Naugatuck River Regional Basin *E.coli* TMDL	6900	Naugatuck River	Recreation	*Escherichia coli*	2008	https://portal.ct.gov/-/media/DEEP/water/tmdl/CTFinalTMDL/naugatuckRegional	4a

2.3 PHOSPHORUS

DEEP developed a final report "Recommendations for Phosphorus Strategy Pursuant to PA 12-155" (February 16, 2017) (Phosphorus Strategy PA12-155) for freshwater in 2017. The Phosphorus Strategy applies to the Naugatuck River; however, the Permittee was not required to meet phosphorus reduction targets or performance limits pursuant to enrichment factor (EF) goals. Therefore, only monitoring requirements are included in the permit.

SECTION 3 PERMIT CONDITIONS AND EFFLUENT LIMITATIONS

3.1 POLLUTANTS OF CONCERN

The following pollutants are included as monitoring pollutants in the permit for the reasons noted below:

POLLUTANT	REASON FOR INCLUSION			
	POLLUTANT WITH AN APPLICABLE TECHNOLOGY-BASED LIMIT	POLLUTANT WITH A WASTE LOAD ALLOCATION FROM A TMDL	POLLUTANT IDENTIFIED AS PRESENT IN THE EFFLUENT THROUGH SAMPLING	POLLUTANT OTHERWISE EXPECTED TO BE PRESENT IN THE EFFLUENT
Aluminum, total				✓
Ammonia as N, total			✓	
Biochemical Oxygen Demand (5- day)			✓	
Cadmium, total	✓		✓	
Chlorine, total residual			✓	
Chloroform			✓	
Chromium, hexavalent	✓		✓	
Chromium, total	✓		✓	
Copper, total	✓		✓	
Cyanide, total	✓		✓	
Fluoride, total			✓	
Iron, total			✓	
Kjeldahl Nitrogen, Total (as N)	✓		✓	✓
Lead, total	✓		✓	
Methylene Chloride			✓	
Nickel, total	✓		✓	
Nitrate (as N)			✓	✓

POLLUTANT	REASON FOR INCLUSION			
	POLLUTANT WITH AN APPLICABLE TECHNOLOGY-BASED LIMIT	POLLUTANT WITH A WASTE LOAD ALLOCATION FROM A TMDL	POLLUTANT IDENTIFIED AS PRESENT IN THE EFFLUENT THROUGH SAMPLING	POLLUTANT OTHERWISE EXPECTED TO BE PRESENT IN THE EFFLUENT
Nitrite (as N)			✓	✓
Oil & Grease, total	✓		✓	
Phosphorus, total			✓	
Silver, total	✓		✓	
Solids, total dissolved			✓	
Solids, total suspended	✓		✓	
Surfactants, anionic (MBAS)			✓	
Total Toxic Organics	✓		✓	
Zinc, total	✓		✓	

Acute and chronic toxicity monitoring requirements are also included in the permit consistent with Section 22a-430-3(j)(3) of the RCSA. pH monitoring was also included in the permit consistent with Section 22a-426-9(a)(1).

3.2 TECHNOLOGY BASED EFFLUENT LIMITATIONS

Technology-based treatment requirements represent the minimum level of control that must be imposed under CWA § 301(b) and 402 to meet best practicable control technology currently available (“BPT”) for conventional pollutants and some metals, best conventional control technology (“BCT”) for conventional pollutants, and best available technology economically achievable (“BAT”) for toxic and non-conventional pollutants. *See* 40 CFR § 125 Subpart A and RCSA Section 22a-430-4(l)(4)(A).

Subpart A of 40 CFR Part 125 establishes criteria and standards for the imposition of technology-based treatment requirements in permits under § 301(b) of the CWA, including the application of EPA promulgated Effluent Limitation Guidelines (“ELGs”) and case-by-case determinations of effluent limitations under CWA § 402(a)(1). EPA promulgates New Source Performance Standards (“NSPS”) under CWA § 306 and 40 CFR § 401.12. *See also* 40 CFR §§ 122.2 (definition of “new source”) and 122.29.

In the absence of published technology-based effluent guidelines, the permit writer is authorized under CWA § 402(a)(1)(B) and RCSA section 22a-430-4(m) to establish effluent limitations on a case-by-case basis using best professional judgment (“BPJ”).

The following Effluent Guidelines and Standards were reviewed to determine their applicability to the facility’s discharge DSN 001A:

3.2.1 40 CFR 433: METAL FINISHING POINT SOURCE CATEGORY:

Wieland is a re-roll facility that has been discharging wastewaters from the site since the 1930s. Wieland performs electroplating and passivation which are part of the “core” and “ancillary” operations identified in 40 CFR 433. Therefore, its discharge is regulated as a metal finishing discharge under 40 CFR 433. Since Wieland has discharged since 1930s/1940s and has not made recent significant changes, it is considered an existing source.

3.2.2 40 CFR 468: COPPER FORMING POINT SOURCE CATEGORY:

40 CFR 468 is applicable to the discharges associated with copper forming operations (see Attachment B for 40 CFR 468 effluent guidelines). The facilities regulated by the copper forming category are generally included within SIC codes 3351 and 3357. Wieland's activities are covered under SIC codes 3351, 3316 and 3356.

Wieland is engaged in acid pickling of copper strip at its site on Line #8. Pickling is a surface treatment process that is classified as an ancillary operation under 40 CFR 468. The copper wire is cleaned and plated as necessary. The spent plating solutions associated with this operation are shipped off-site for disposal.

3.2.3 LIMIT CALCULATION:

The different waste stream flows are summarized below.

Table 3.2.1: Summary of wastewater flows before treatment

Process Line No.	Process	Average Flow (gpd)	Maximum Flow (gpd)
Line # 7	Metal Finishing	36,000	53,000
Line # 8	Copper Forming	21,400	25,900
Line # 9	Metal Finishing	50,000	75,000
Line # 10	Metal Finishing	82,000	129,000
	QA Laboratory	100	100
	DI regeneration wastewater	2,476	4,976
	Incidental rainfall[1]	24	24
	Total	192,000	288,000

[1] See Attachment A

The most stringent of BAT, BPT and BCT of the federal effluent guidelines are used for the derivation of permit limits. Using the building block concept, effluent limitations for the copper forming wastewater from pickling rinse, bath scrubber and fume scrubber operations are calculated based on 1,700 off-kg/day projection by the Permittee.

POLLUTANT	Table 3.2.2: Effluent limits of copper forming wastewater	
	AML (Pickling rinse, bath and fume scrubber)	MDL (Pickling rinse, bath and fume scrubber)
Chromium (BAT)	$[0.235 + 0.02 + 0.112]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 623.9mg$	$[0.574 + 0.051 + 0.275]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 1{,}530mg$
Copper (BAT)	$[1.306 + 0.116 + 0.626]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 3{,}481.6mg$	$[2.481 + 0.220 + 1.189]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 6{,}613mg$
Lead (BAT)	$[0.169 + 0.015 + 0.081]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 450.5mg$	$[0.195 + 0.017 + 0.093]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 518.5mg$
Nickel (BAT)	$[1.658 + 0.147 + 0.795]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 4{,}420mg$	$[2.507 + 0.222 + 1.201]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 6{,}681mg$
Zinc (BAT)	$[0.796 + 0.070 + 0.381]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 2{,}120mg$	$[1.906 + 0.169 + 0.913]\frac{mg}{off-kg}$ X $1{,}700\ off-kg = 5{,}079.6mg$

POLLUTANT	Table 3.2.2: Effluent limits of copper forming wastewater	
	AML (Pickling rinse, bath and fume scrubber)	MDL (Pickling rinse, bath and fume scrubber)
O &G (BPT)	$[43.464 + 1.392 + 7.512]\frac{\text{mg}}{\text{off}-\text{kg}}$ X 1,700 off − kg = 89,025.6mg	$[72.44 + 2.32 + 12.52]\frac{\text{mg}}{\text{off}-\text{kg}}$ X 1,700 off − kg = 148,376mg
TSS (BPT)	$[70.629 + 2.262 + 12.207]\frac{\text{mg}}{\text{off}-\text{kg}}$ X 1,700 off − kg = 144,666.6mg	$[148.502 + 4.756 + 25.666]\frac{\text{mg}}{\text{off}-\text{kg}}$ X 1,700 off − kg = 304,170.8mg

The BAT and BPT effluent limitations for metal finishing wastewaters are converted to mass limits from concentration limits for consistency with the copper forming mass limits using the metal finishing average daily flow as shown below:

POLLUTANT	Table 3.2.3: Effluent limits of metal finishing wastewater	
	Monthly average shall not exceed	Maximum for any 1 day
Chromium	1.71 mg/l X 635,880 l = 1,087,355 mg	2.77 mg/l X 635,880 l = 1,761,388 mg
Copper	2.07 mg/l X 635,880 l = 1,316,272 mg	3.38 mg/l X 635,880 l = 2,149,274 mg
Lead	0.43 mg/l X 635,880 l = 273,428 mg	0.69 mg/l X 635,880 l = 438,757 mg
Nickel	2.38 mg/l X 635,880 l = 1,513,394 mg	3.98 mg/l X 635,880 l = 2,530,802 mg
Zinc	1.48 mg/l X 635,880 l = 941,102 mg	2.61 mg/l X 635,880 l = 1,659,647 mg
O &G	26 mg/l X 635,880 l = 16,532,880 mg	52 mg/l X 635,880 l = 33,065,760 mg
TSS	31 mg/l X 635,880 l = 19,712,280 mg	60mg/l X 635,880 l = 38,152,800 mg
Average daily metal finishing wastewaters = 168,000 gpd = 635,880 liters, 1 gal. = 3.785 liters		

The total mass limits for the process wastewaters are calculated below:

POLLUTANT	Table 3.2.4: Combined copper forming and metal finishing wastewater effluent limits	
	Monthly average shall not exceed	Maximum for any 1 day
Chromium	623.9 + 1,087,355 ≈ 1,087,979 mg	1,530 + 1,761,388 = 1,762,918 mg
Copper	3,481.6 + 1,316,272 ≈ 1,319,754 mg	6,613 + 2,149,274 = 2,155,887 mg
Lead	450.5 + 273,428 ≈ 273,879 mg	518.5 + 438,757 ≈ 439,276 mg
Nickel	4,420 + 1,513,394 = 1,517,814 mg	6,681 + 2,530,802 = 2,537,483 mg
Zinc	2,120 + 941,102 = 943,222 mg	5,079.6 + 1,659,647 ≈ 1,664,727mg
O &G	89,025.6 + 16,532,880 ≈ 16,621,906 mg	148,376 + 33,065,760 = 33,214,136 mg
TSS	144,666.6 + 19,712,280 = 19,856,947 mg	304,170.8 + 38,152,800 = 38,456,971 mg

The wastewater comprises of process wastewater, incidental rainfall water, QA Laboratory water and DI regeneration wastewater and laboratory wastewater. Many of the pollutants are not expected to be present in the dilution water (DI regeneration wastewater, laboratory water and incidental rainfall). Therefore, the concentration limits are adjusted using the combined waste stream formula as shown in the table below:

POLLUTANT	Table 3.2.5: Adjusted effluent limitation based on combined waste stream formula
	Process flow = 189,400 gpd = 716,879 liters/day, Laboratory wastewater = 100 gpd = 378.5 liters/day, DI regeneration wastewater = 2,476 gpd ≈ 9,372 liters/day, Incidental rainfall = 24 gpd = 91 liters/day, Combined total flow = 192,000 gpd = 726,720 liters/day, (1 gal. = 3.785 liters). The pollutant concentrations are assumed to be zero in the dilution waste stream.

	State Limits Based on Section 22a-430-4(s)(2) of the RCSA	40 CFR 433 and 40 CFR 468 Federal Effluent Limitation
Aluminum	$AML = 2.0\frac{mg}{l} = \frac{2.0\frac{mg}{l} X 716,879}{726,720} = 1.973\frac{mg}{l}$ $MDL = 4.0\frac{mg}{l} = \frac{4.0\frac{mg}{l} X 716,879}{726,720} = 3.946\frac{mg}{l}$ $MIL = 6.0\frac{mg}{l} = \frac{6.0\frac{mg}{l} X 716,879}{726,720} = 5.919\frac{mg}{l}$	
Cadmium	$AML = 0.1\frac{mg}{l} = \frac{0.1\frac{mg}{l} X 716,879}{726,720} = 0.099\frac{mg}{l}$ $MDL = 0.5\frac{mg}{l} = \frac{0.5\frac{mg}{l} X 716,879}{726,720} = 0.493\frac{mg}{l}$ $MIL = 0.75\frac{mg}{l} = \frac{0.75\frac{mg}{l} X 716,879}{726,720} = 0.740\frac{mg}{l}$	$AML = 0.26\frac{mg}{l} = \frac{0.26\frac{mg}{l} X 716,879}{726,720} = 0.256\frac{mg}{l}$ $MDL = 0.69\frac{mg}{l} = \frac{0.69\frac{mg}{l} X 716,879}{726,720} = 0.681\frac{mg}{l}$
Chromium	$AML = 1.0\frac{mg}{l} = \frac{1.0\frac{mg}{l} X 716,879}{726,720} = 0.986\frac{mg}{l}$ $MDL = 2.0\frac{mg}{l} = \frac{2.0\frac{mg}{l} X 716,879}{726,720} = 1.973\frac{mg}{l}$ $MIL = 3.0\frac{mg}{l} = \frac{3.0\frac{mg}{l} X 716,879}{726,720} = 2.959\frac{mg}{l}$	$AML = \frac{1,087,979\ mg}{726,720\ litres} = 1.497\frac{mg}{l}$ $MDL = \frac{1,762,918\ mg}{726,720\ litres} = 2.426\frac{mg}{l}$
Chromium, hexavalent	$AML = 0.1\frac{mg}{l} = \frac{0.1\frac{mg}{l} X 716,879}{726,720} = 0.099\frac{mg}{l}$ $MDL = 0.2\frac{mg}{l} = \frac{0.2\frac{mg}{l} X 716,879}{726,720} = 0.197\frac{mg}{l}$ $MIL = 0.3\frac{mg}{l} = \frac{0.3\frac{mg}{l} X 716,879}{726,720} = 0.296\frac{mg}{l}$	
Copper	$AML = 1.0\frac{mg}{l} = \frac{1.0\frac{mg}{l} X 716,879}{726,720} = 0.986\frac{mg}{l}$ $MDL = 2.0\frac{mg}{l} = \frac{2.0\frac{mg}{l} X 716,879}{726,720} = 1.973\frac{mg}{l}$ $MIL = 3.0\frac{mg}{l} = \frac{3.0\frac{mg}{l} X 716,879}{726,720} = 2.959\frac{mg}{l}$	$AML = \frac{1,319,754\ mg}{726,720\ litres} = 1.816\frac{mg}{l}$ $MDL = \frac{2,155,887\ mg}{726,720\ litres} = 2.967\frac{mg}{l}$
Cyanide	$AML = 0.65\frac{mg}{l} = \frac{0.65\frac{mg}{l} X 716,879}{726,720} = 0.641\frac{mg}{l}$ $MDL = 1.2\frac{mg}{l} = \frac{1.2\frac{mg}{l} X 716,879}{726,720} = 1.184\frac{mg}{l}$	
Iron	$AML = 3.0\frac{mg}{l} = \frac{3.0\frac{mg}{l} X 716,879}{726,720} = 2.959\frac{mg}{l}$ $MDL = 5.0\frac{mg}{l} = \frac{5.0\frac{mg}{l} X 716,879}{726,720} = 4.932\frac{mg}{l}$ $MIL = 7.5\frac{mg}{l} = \frac{7.5\frac{mg}{l} X 716,879}{726,720} = 7.398\frac{mg}{l}$	
Lead	$AML = 0.1\frac{mg}{l} = \frac{0.1\frac{mg}{l} X 716,879}{726,720} = 0.099\frac{mg}{l}$ $MDL = 0.5\frac{mg}{l} = \frac{0.5\frac{mg}{l} X 716,879}{726,720} = 0.493\frac{mg}{l}$ $MIL = 0.75\frac{mg}{l} = \frac{0.75\frac{mg}{l} X 716,879}{726,720} = 0.740\frac{mg}{l}$	$AML = \frac{273,879\ mg}{726,720\ litres} = 0.377\frac{mg}{l}$ $MDL = \frac{439,276\ mg}{726,720\ litres} = 0.604\frac{mg}{l}$
Nickel	$AML = 1.0\frac{mg}{l} = \frac{1.0\frac{mg}{l} X 716,879}{726,720} = 0.986\frac{mg}{l}$ $MDL = 2.0\frac{mg}{l} = \frac{2.0\frac{mg}{l} X 716,879}{726,720} = 1.973\frac{mg}{l}$ $MIL = 3.0\frac{mg}{l} = \frac{3.0\frac{mg}{l} X 716,879}{726,720} = 2.959\frac{mg}{l}$	$AML = \frac{1,517,814\ mg}{726,720\ litres} = 2.088\frac{mg}{l}$ $MDL = \frac{2,537,483\ mg}{726,720\ litres} = 3.492\frac{mg}{l}$

POLLUTANT	**Table 3.2.5: Adjusted effluent limitation based on combined waste stream formula**	
	Process flow = 189,400 gpd = 716,879 liters/day, Laboratory wastewater = 100 gpd = 378.5 liters/day, DI regeneration wastewater = 2,476 gpd ≈ 9,372 liters/day, Incidental rainfall = 24 gpd = 91 liters/day, Combined total flow = 192,000 gpd = 726,720 liters/day, (1 gal. = 3.785 liters). The pollutant concentrations are assumed to be zero in the dilution waste stream.	
	State Limits Based on Section 22a-430-4(s)(2) of the RCSA	40 CFR 433 and 40 CFR 468 Federal Effluent Limitation
Silver	AML = $0.1\frac{mg}{l} = \frac{0.1\frac{mg}{l} X\ 716,879}{726,720} = 0.099\ \frac{mg}{l}$ MDL = $0.5\frac{mg}{l} = \frac{0.5\frac{mg}{l} X\ 716,879}{726,720} = 0.493\ \frac{mg}{l}$ MIL = $0.75\frac{mg}{l} = \frac{0.75\frac{mg}{l} X\ 716,879}{726,720} = 0.740\ \frac{mg}{l}$	AML = $0.24\frac{mg}{l} = \frac{0.24\frac{mg}{l} X\ 716,879}{726,720} = 0.237\ \frac{mg}{l}$ MDL = $0.43\frac{mg}{l} = \frac{0.43\frac{mg}{l} X\ 716,879}{726,720} = 0.424\ \frac{mg}{l}$
O&G	AML = $10\frac{mg}{l} = \frac{10\frac{mg}{l} X\ 716,879}{726,720} = 9.864\ \frac{mg}{l}$ MIL = $20\frac{mg}{l} = \frac{20\frac{mg}{l} X\ 716,879}{726,720} = 19.729\ \frac{mg}{l}$	AML = $\frac{16,621,906\ mg}{726,720\ litres} = 22.873\ \frac{mg}{l}$ MDL = $\frac{33,214,136\ mg}{726,720\ litres} = 45.704\ \frac{mg}{l}$
TSS	AML = $20\frac{mg}{l} = \frac{20\frac{mg}{l} X\ 716,879}{726,720} = 19.727\ \frac{mg}{l}$ MDL = $30\frac{mg}{l} = \frac{30\frac{mg}{l} X\ 716,879}{726,720} = 29.594\ \frac{mg}{l}$ MIL = $45\frac{mg}{l} = \frac{45\frac{mg}{l} X\ 716,879}{726,720} = 44.391\ \frac{mg}{l}$	AML = $\frac{19,856,947\ mg}{726,720\ litres} = 27.324\ \frac{mg}{l}$ MDL = $\frac{38456,971\ mg}{726,720\ litres} = 52.918\ \frac{mg}{l}$
TTO	MIL = 2.13 mg/l = $\frac{2.13\frac{mg}{l} X\ 716,879}{726,720} = 2.101\ \frac{mg}{l}$	
Zinc	AML = $1.0\frac{mg}{l} = \frac{1.0\frac{mg}{l} X\ 716,879}{726,720} = 0.986\ \frac{mg}{l}$ MDL = $2.0\frac{mg}{l} = \frac{2.0\frac{mg}{l} X\ 716,879}{726,720} = 1.973\ \frac{mg}{l}$ MIL = $3.0\frac{mg}{l} = \frac{3.0\frac{mg}{l} X\ 716,879}{726,720} = 2.959\ \frac{mg}{l}$	AML = $\frac{943,222\ mg}{726,720\ litres} = 1.298\ \frac{mg}{l}$ MDL = $\frac{1,664,727\ mg}{726,720\ litres} = 2.291\ \frac{mg}{l}$
AML: Average Monthly Limit	MDL: Maximum Daily Limit	MIL: Maximum Instantaneous Limit

Combined waste stream formula: $C_T = \frac{\sum_{i=1}^{n} C_i F_i}{\sum_{i=1}^{n} F_i}\left\{\frac{F_T - F_D}{F_T}\right\}$

Where C_T = the alternative concentration limit,
C_i = the categorical concentration limit for a pollutant in the regulated stream I,
F_i = the average daily flow of stream i to the extent that it is regulated for such pollutant,
F_D = the average daily flow of stream of dilute waste stream,
F_T = the average daily flow of combined waste stream and
n = the total number of regulated streams.

3.3 BASIS FOR LIMITS

Technology and water-quality based requirements are considered when developing permit limits. Technology-based limits represent the minimum level of control imposed under the Clean Water Act ("CWA"). Industry-specific technology-based limits ("TBELs") are set forth in 40 CFR 405 – 471 (EPA's Effluent Limitation Guidelines) and in RCSA section 22a-430-4(s)(2). Water quality-based limits ("WQBELS") are designed to protect water quality and are determined using the procedures set for in EPA's *Technical Support Document for Water Quality-Based Toxics Control*, 1991 ("TSD"). When both technology and water quality-based limits apply to a particular pollutant, the more stringent limit would apply. In addition, water quality-based limits are required when any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) is or may be discharged at a level that causes, has reasonable potential to cause, or contributes to an excursion above any water quality criteria. Numeric water quality criteria are found in RCSA Section 22a-426-9 of the Connecticut Water Quality Standards ("WQS").

3.4 ZONE OF INFLUENCE

Section 22a-426-4(l) of the Regulations of Connecticut State Agencies states that "The Commissioner may, on a case-by-case basis, establish zones of influence ("ZOI") when authorizing discharges to surface waters under Sections 22a-430 and 22a-133(k) of the CGS in order to allocate a portion of the receiving surface waters for mixing and assimilation of the discharge."

The previously assigned zone of influence of 219,463 gallons per hour ("gph") was carried forward.

The discharge occurs continuously, and the average permitted flow is 192,000 gpd.
The average hourly flow ("AML") = 192,000 gpd ÷ 24 = 8000 gph

$$\text{Instream Waste Concentration (IWC)} = \frac{\text{AML}}{\text{AML+ZOI}} \text{X } 100\% = \frac{8{,}000}{8{,}000 + 219{,}463} = 3.517\% \approx 3.5\%$$

3.5 RESONABLE POTENTIAL ANALYSIS

Pursuant to CWA § 301(b)(1)(C) and 40 CFR § 122.44(d)(1), NPDES permits must contain any requirements in addition to TBELs that are necessary to achieve water quality standards established under § 303 of the CWA. *See also* 33 U.S.C. § 1311(b)(1)(C). In addition, limitations "must control any pollutant or pollutant parameter (conventional, non-conventional, or toxic) which the permitting authority determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including State narrative criteria for water quality." 40 CFR § 122.44(d)(1)(i). To determine if the discharge causes, or has the reasonable potential to cause, or contribute to an excursion above any WQS, EPA considers: 1) existing controls on point and non-point sources of pollution; 2) the variability of the pollutant or pollutant parameter in the effluent; 3) the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity); and 4) where appropriate, the dilution of the effluent by the receiving water. *See* 40 CFR § 122.44(d)(1)(ii).

If the permitting authority determines that the discharge of a pollutant will cause, has the reasonable potential to cause, or contribute to an excursion above WQSs, the permit must contain water quality-based effluent limits or require additional monitoring if there is insufficient data to develop a WQBEL, for that pollutant. *See* 40 CFR § 122.44(d)(1)(i). The reasonable potential analysis below indicates that water quality-based limits are needed for chlorine, chromium hexavalent, chromium, copper, lead and zinc.

3.6 WATERBODY AMBIENT CONDITIONS

Table 3.6.1: Waterbody pollutants background concentrations (µg/l)

Pollutants	Mean Naugatuck River concentration from 2019 – 2023 chronic toxicity testing data	Pollutants	Mean Naugatuck River concentration from 2019 – 2023 chronic toxicity testing data
Ammonia	57	Iron	347.6
Cadmium	0	Lead	0
Chlorine	2.73	Methylene chloride	No data
Chromium, hex	0.67	Nickel	0
Chromium	0	Silver	0
Copper	3.4	Zinc	16.3
Cyanide	0	---	---

Section 22a-426-9 of the RCSA specifies water quality criteria for ammonia based on the presence or absence of salmonids. Adult Atlantic salmon are stocked in the Naugatuck River each fall (at various times starting in September, pending river conditions); it is one of three river sections designated as "Atlantic Salmon Management Areas"(see Section 26-112-46 (h) of the RCSA). Criteria for ammonia, (mg/L as Nitrogen) vary in response to ambient surface water temperature (T in ^{o}C) and pH. Biological integrity is considered impaired when:

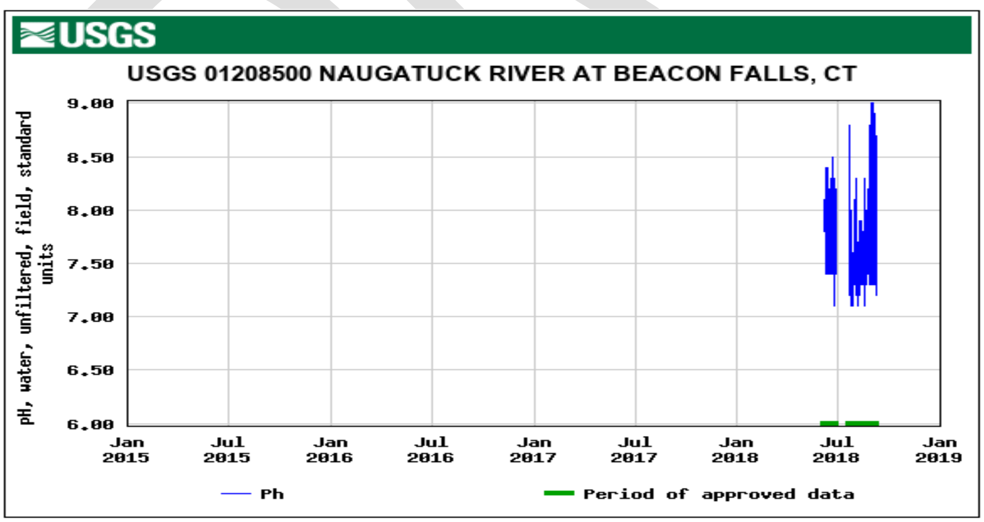
A) One hour average concentraion of total ammonia exceeds: $\left(\left[\frac{0.275}{1+10^{7.204-\mathrm{pH}}}\right]+\left[\frac{39}{1+10^{\mathrm{pH}-7.204}}\right]\right)$

B) Four-day average concentration of total ammonia exceeds: 30-day average x 2.5

C) 30 day average concentration of total ammonia exceeds: $\left[\frac{0.0577}{1+10^{7.688-\mathrm{pH}}}\right]$

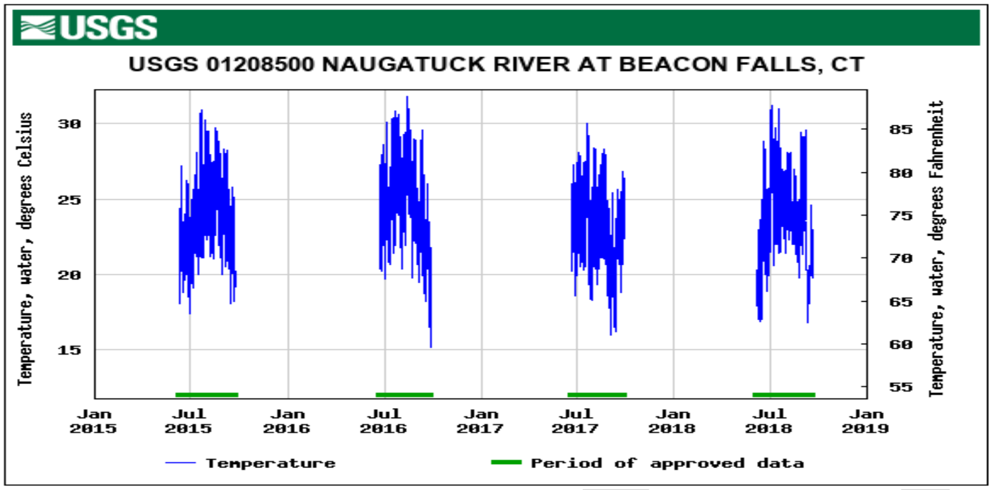
$$+\left[\frac{2.487}{1+10^{\mathrm{pH}-7.688}}\right] \text{ x } [1.45 \text{ x } (10^{0.028(25-T)})$$

pH data: July 2018 data for Naugatuck River at Beacon Falls (Gage station No. 01208500) and 2019 – 2023 upstream data of Naugatuck River collected with Wieland's chronic toxicity testing:



Minimum: 6.6 S.U.
Maximum: 9 S.U.
Average: 7.5 S.U.

Temperature data: Historic summer temperature data (June 10, 2015, July 2016, July 2017 and July 2018) for Naugatuck River at Beacon Falls (Gage station No. 01208500)



Minimum: 22.5 ^oC
Maximum: 31.2 ^oC
Average: 26.9 ^oC

$$\text{Acute: One hour average concentraion} = \left(\left[\frac{0.275}{1+10^{7.204-9}}\right] + \left[\frac{39}{1+10^{9-7.204}}\right]\right) = 0.885\frac{\text{mg}}{\text{l}} = 885\frac{\mu\text{g}}{\text{l}}$$

$$\text{Chronic: 30 day average concentration} = \left[\frac{0.0577}{1+10^{7.688-7.5}}\right] + \left[\frac{2.487}{1+10^{7.5-7.688}}\right] \text{x} \left[1.45 \text{ x} \left(10^{0.028(25-31.2)}\right) = 1.489\frac{\text{mg}}{\text{l}} = 1{,}489\frac{\mu\text{g}}{\text{l}}\right.$$

$$\text{Chronic: Four day concentration} = \text{30 day average concentration X 2.5} = 3.723\frac{\text{mg}}{\text{l}} = 3{,}723\frac{\mu\text{g}}{\text{l}}$$

Table 3.7.1: Reasonable Potential Evaluation
(This analysis compares the projected maximum concentration (PMC) in the receiving stream with the applicable water quality criteria (WQC). When the PMC is lower than the WQC, there is no potential for the discharge to exceed the WQC. When the PMC is higher than the WQC, there is a potential for the discharge to exceed the WQC and permit limits are therefore needed.)

Q = Flow, C = Concentration, $(QC)_u$ = Upstream data, $(QC)_d$ = Downstream data, $(QC)_e$ = Effluent data and $Q_d = Q_u + Q_e$. Q_e = 192,000 gpd = 8,000 gph, $Q_{u,ac/ch}$ = 219,463 gph, $Q_{u,he}$ = 438,926 gph, $Q_{d,ac/ch}$ = 227,463 gph and $Q_{d,he}$ = 446,926 gph

Pollutants	PMC in effluent = Maximum measured concentration X multiplier in Attachment C	PMC in the waterbody $C_d = \frac{(QC)_u + (QC)_e}{Q_d}$	Connecticut Water Quality Criteria (WQC) (Freshwater)			Is there potential to exceed WQC?
			Aquatic Life (Acute) (µg/l)	Aquatic Life (Chronic) (µg/l)	Human Health (µg/l)	
Cadmium	This was always below detection level	This was always below detection level	1.0	0.125	10,769	No
Chlorine	210 X 2.6 = 546	21.84	19	11	---	Yes
Chloroform[1]	3 X 6.1 = 18.3	18.3	---	---	470	No

Table 3.7.1: Reasonable Potential Evaluation
(This analysis compares the projected maximum concentration (PMC) in the receiving stream with the applicable water quality criteria (WQC). When the PMC is lower than the WQC, there is no potential for the discharge to exceed the WQC. When the PMC is higher than the WQC, there is a potential for the discharge to exceed the WQC and permit limits are therefore needed.)

Q = Flow, C = Concentration, $(QC)_u$ = Upstream data, $(QC)_d$ = Downstream data, $(QC)_e$ = Effluent data and $Q_d = Q_u + Q_e$. Q_e = 192,000 gpd = 8,000 gph, $Q_{u,ac/ch}$ = 219,463 gph, $Q_{u,he}$ = 438,926 gph, $Q_{d,ac/ch}$ = 227,463 gph and $Q_{d,he}$ = 446,926 gph

Pollutants	PMC in effluent = Maximum measured concentration X multiplier in Attachment C	PMC in the waterbody $C_d = \frac{(QC)_u + (QC)_e}{Q_d}$	Connecticut Water Quality Criteria (WQC) (Freshwater)			Is there potential to exceed WQC?
			Aquatic Life (Acute) (µg/l)	Aquatic Life (Chronic) (µg/l)	Human Health (µg/l)	
Chromium, hex	50 X 6.8 = 340	12.6	16	11	2,019	Yes
Chromium, total	180 X 6.8 = 1,224	43.05	323	42	1,009,615	Yes
Cyanide	This was always below detection level	This was always below detection level	22	5.2	140	No
Copper	400 X 3.5 = 1,400	52.52	25.7	18.1	1,300	Yes
Lead	10 X 6.8 = 68	2.39	30	1.2	---	Yes
Methylene chloride[1]	3 X 6.8 = 20.4	20.4	---	---	590	No
Nickel	60 X 6.8 = 408	14.35	260.5	28.9	4,600	No
Silver	2 X 6.8 = 13.6	0.48	1.02	---	107,762	No
Zinc	2,380 X 6.8 = 16,184	584.93	65	65	26,000	Yes
			Acute One-day average	Chronic Four-day average	Chronic 30-day average	
Ammonia	290 X 6.8 = 1,972	124.36	885	3,723	1,489	No
EPA's National recommended water quality aquatic life chronic criterion for iron is 1,000 µg/l						
Iron	7,600 X 6.8 = 51,680	2,152.99	---	1,000	---	Yes
[1]No mixing allowed for chloroform and methylene chloride because they are probable or possible carcinogens.						

3.7 WATER QUALITY BASED EFFLUENT LIMITATIONS

The CWA and federal regulations require that effluent limitations based on water quality considerations be established for point source discharges when such limitations are necessary to meet state or federal water quality standards that are applicable to the designated receiving water. This is necessary when less stringent TBELs would interfere with the attainment or maintenance of water quality criteria in the receiving water. *See* CWA § 301(b)(1)(C) and 40 CFR §§ 122.44(d)(1),122.44(d)(5), 125.84(e) and 125.94(i).

The reasonable potential analysis in Section 3.5 showed that water quality-based limits are needed for chlorine, chromium hexavalent, chromium, copper, lead and zinc. Therefore, the limits for these pollutants are calculated below.

Table 3.7.2: Permit Limits Calculation

Determine Waste Load Allocation

WLA = Waste load allocation, $(QC)_d$ = Downstream data, $(QC)_u$ = Upstream data, Qe = Discharge flow (see Table 3.7.1 for flow data).

	$WLA_{ac} = \frac{(QC)_d - (QC)_u}{Q_e}$	$WLA_{ch} = \frac{(QC)_d - (QC)_u}{Q_e}$	$WLA_{he} = \frac{(QC)_d - (QC)_u}{Q_e}$
Chlorine	465.33	237.87	---
Chromium, hex	436.54	294.38	112,756
Chromium	9,183.82	1,194.18	56,402.90
Copper	637.45	421.36	72,438.93
Iron	--	18,897.21	---
Lead	852.99	34.12	---
Zinc	1,400.98	1,400.98	1,451,615

Determine long term averages and permit limits

LTA = Long term average, AML = Average monthly limit, and MDL = Maximum daily limit

Pollutants	LTA_{acute} = WLA_{ac} X 99th percentile multiplier in Attachment D	$LTA_{chronic}$ = WLA_{ch} X 99th percentile multiplier in Attachment D	Governing LTA	AML = LTA X 95th percentile multiplier in Attachment E	MDL = LTA X 99th percentile multiplier in Attachment E
Chlorine	465.33 X 0.281 = 130.76	237.87 X 0.481 = 114.41	114.4	114.4 X 1.65 ≈ 189	114.4 x 3.56 ≈ 407
Chromium, hex	436.54 X 0.117 = 51.07	294.38 X 0.204 = 60.05	51.07	51.07 X 2.75 ≈ 140	51.07 X 8.55 ≈ 437
Chromium, total	9,183.82 X 0.117 = 1074.51	1,194.18 X 0.204 = 243.61	243.61	243.61 X 2.75 ≈ 670	243.61 X 8.55 ≈ 2083
Copper	637.45 X 0.204 = 130.04	421.36 X 0.373 = 157.17	130.04	130.04 X 1.95 ≈ 254	130.04 X 4.9 ≈ 637
AML (Mass in kg/d) = 254 ug/l X 192,024 gpd X 3.785 (1 gal = 3.785 liters) = 0.185 kg/d MDL (Mass in kg/d) = 637 ug/l X 192,024 gpd X 3.785 (1 gal = 3.785 liters) = 0.463 kg/d					
Iron		18,894.97 X 0.204 = 3,854.57	3,854.57	3,854.57 X 2.75 ≈ 10,600	3,854.57 X 8.55 ≈ 32,957
Lead	852.99 X 0.117 = 99.80	34.12 X 0.204 = 6.96	6.96	6.96 X 2.75 ≈ 19	6.96 X 8.55 ≈ 60
AML (Mass in kg/d) = 19 ug/l X 192,024 gpd X 3.785 (1 gal = 3.785 liters) = 0.014 kg/d MDL (Mass in kg/d) = 60 ug/l X 192,024 gpd X 3.785 (1 gal = 3.785 liters) = 0.044 kg/d					
Zinc	1,400.98 X 0.117 = 163.91	1,400.98 X 0.204 = 285.80	163.91	163.91 X 2.75 ≈ 451	163.91 X 8.55 ≈ 1401
AML (Mass in kg/d) = 451 ug/l X 192,024gpd X 3.785 (1 gal = 3.785 liters) = 0.328 kg/d MDL (Mass in kg/d) = 1,401 ug/l X 192,024gpd X 3.785 (1 gal = 3.785 liters) = 1.018 kg/d					

3.8 WHOLE EFFLUENT TOXICITY

The Permittee shall comply with effluent standards or prohibitions established by CWA § 307(a) and RCSA Section 22a-430-4(l) and may not discharge toxic pollutants in concentrations or combinations that are harmful to humans, animals, or aquatic life.

If toxicity is suspected in the effluent, DEEP may require the Permittee to perform additional acute or chronic whole effluent toxicity testing.

Wieland's previous permit required quarterly acute toxicity testing using *Daphnia pulex* and *Pimephales promelas* and annual chronic toxicity testing using *Ceriodaphnia dubia* and *Pimephales promelas*. The previous permit also had acute toxicity limits of LC_{50} > 70% and no chronic toxicity limit. During the last permit cycle, Wieland had exceedances of its acute toxicity limits in June and December of 2020 and December of 2022. Based on the review of DMR data, the lowest LC_{50} result was 6.25%.

<u>Reasonable Potential Analysis</u>

Acute toxicity shall be assumed to occur at any discharge concentration which exceeds the LC50 concentration determined in an acute toxicity test multiplied by an application factor of 0.33. The projected maximum toxicity is determined by multiplying the maximum toxicity with the multiplier from Appendix C and the dilution factor. A default coefficient of variation of 0.6 is assumed.

$$Acute\ toxic\ unit\ (TU_a) = \frac{100}{LC_{50}}$$

$$TU_a = \frac{100}{6.25} = 16TU_a$$

Projected maximum toxicity = 16 TU_a (highest observed toxicity data) X 2.6 (multiplier in Appendix C) X 0.035 (dilution factor) = 1.46 TU_a, which is higher than EPA's TSD recommended whole effluent toxicity criteria for protection against acute effects: 0.3TU_a. Therefore, there is a reasonable potential of causing toxicity and a limit is needed.

$$\mathrm{DF} = \frac{\mathrm{AML} + \mathrm{ZOI}}{\mathrm{AML}}$$

$$\mathrm{DF} = \frac{219{,}463 + 8{,}000}{8{,}000} = 28.433$$

$$\mathrm{IWC} = \frac{1}{\mathrm{DF}} \text{ X } 100\% = 3.52\% \approx 3.5\%$$ for acute and chronic criteria

The maximum daily limit for toxicity is based on the concentration that will prevent toxicity within the receiving stream as specified in Section 22a-430-3(j)(7)(B)(i) of the RCSA.

$$\text{Chronically toxic } \mathrm{LC}_{50} = \text{Acceptable } \mathrm{LC}_{50} \text{ X } 0.05$$

$$\text{Toxicity test } \frac{\mathrm{LC}_{50}}{0.05} = \text{non} - \text{chronically toxic effluent \% at ZOI border}$$

$$\text{Therefore, the toxicity limit: } \mathrm{LC}_{50} = \mathrm{IWC} \text{ X } 20 = 3.5 \text{ X } 20 = 70\%.$$

3.9 COMPARISON OF LIMITS

After preparing and evaluating applicable TBELs (at 40 CFR 468 and 40 CFR 433, and Section 22a-430-4(s)(2) of the RCSA), the effluent limitations are compared with the WQBELs, and the previous permit limitations. The most stringent limits are applied in the permit as shown in the table below.

Table 3.9.1: Comparison of Limits Based on Different Criteria

Pollutants	Adjusted State Limits Based on Section 22a-430-4(s)(2) of the RCSA (See Table 3.2.5)	Adjusted Federal Reg. Limits 40 CFR 433 and 40 CFR 468 Subpart A (Using the combined waste-stream formula) (See Table 3.2.5)	Water Quality-Based Effluent Limits Based on EPA/505/2-90-001 (See Table 3.7.1)	Previous permit limits
Aluminum	AML = 1.973 $\frac{mg}{l}$ MDL = 3.946 $\frac{mg}{l}$ MIL = 5.919 $\frac{mg}{l}$	NA		NA
Cadmium	AML = 0.099 $\frac{mg}{l}$ MDL = 0.493 $\frac{mg}{l}$ MIL = 0.740 $\frac{mg}{l}$	AML = 0.256 $\frac{mg}{l}$ (40 CFR 433 only) MDL = 0.681 $\frac{mg}{l}$ (40 CFR 433 only)		AML = 0.1 $\frac{mg}{l}$ AML = 0.0208 $\frac{kg}{d}$ MDL = 0.5 $\frac{mg}{l}$ MDL = 0.0418 $\frac{kg}{d}$ MIL = 0.75 $\frac{mg}{l}$
Chlorine	NA	NA	AML = 0.189 $\frac{mg}{l}$ MDL = 0.407 $\frac{mg}{l}$ MIL = 0.611 $\frac{mg}{l}$ (BPJ)	AML = 0.256 $\frac{mg}{l}$ MDL = 0.514 $\frac{mg}{l}$ MIL = 0.771 $\frac{mg}{l}$
Chromium hexavalent	AML = 0.099 $\frac{mg}{l}$ MDL = 0.197 $\frac{mg}{l}$ MIL = 0.296 $\frac{mg}{l}$		AML = 0.140 $\frac{mg}{l}$ MDL = 0.437 $\frac{mg}{l}$ MIL = 0.656 $\frac{mg}{l}$ (BPJ)	AML = 0.1 $\frac{mg}{l}$ MDL = 0.2 $\frac{mg}{l}$ MIL = 0.3 $\frac{mg}{l}$
Chromium	AML = 0.986 $\frac{mg}{l}$ MDL = 1.972 $\frac{mg}{l}$ MIL = 2.959 $\frac{mg}{l}$	AML = 1.497 $\frac{mg}{l}$ MDL = 2.426 $\frac{mg}{l}$	AML = 0.67 $\frac{mg}{l}$ MDL = 2.083 $\frac{mg}{l}$ MIL = 3.12 $\frac{mg}{l}$ (BPJ)	AML = 0.95 $\frac{mg}{l}$ MDL = 1.89 $\frac{mg}{l}$ MIL = 2.84 $\frac{mg}{l}$
Copper	AML = 0.986 $\frac{mg}{l}$ MDL = 1.973 $\frac{mg}{l}$ MIL = 2.959 $\frac{mg}{l}$	AML = 1.816 $\frac{mg}{l}$ MDL = 2.967 $\frac{mg}{l}$	AML = 0.254 $\frac{mg}{l}$ AML = 0.184 $\frac{kg}{d}$ MDL = 0.637 $\frac{mg}{l}$ MDL = 0.463 $\frac{kg}{d}$ MIL = 0.956 $\frac{mg}{l}$ (BPJ)	AML = 0.96 $\frac{mg}{l}$ AML = 0.265 $\frac{kg}{d}$ MDL = 1.92 $\frac{mg}{l}$ MDL = 0.531 $\frac{kg}{d}$ MIL = 2.88 $\frac{mg}{l}$
Cyanide	AML = 0.641 mg/l MDL = 1.184 mg/l	AML = 0.65 mg/l (40 CFR 433 only) MDL = 1.2 mg/l (40 CFR 433 only)		MDL = 1.2 mg/l
Fluoride				AML = 20 $\frac{mg}{l}$ MDL = 30 $\frac{mg}{l}$ MIL = 45 $\frac{mg}{l}$

Table 3.9.1: Comparison of Limits Based on Different Criteria				
Pollutants	Adjusted State Limits Based on Section 22a-430-4(s)(2) of the RCSA (See Table 3.2.5)	Adjusted Federal Reg. Limits 40 CFR 433 and 40 CFR 468 Subpart A (Using the combined waste-stream formula) (See Table 3.2.5)	Water Quality-Based Effluent Limits Based on EPA/505/2-90-001 (See Table 3.7.1)	Previous permit limits
Iron	AML = 2.959 $\frac{mg}{l}$ MDL = 4.932 $\frac{mg}{l}$ MIL = 7.398 $\frac{mg}{l}$		AML = 10.6 $\frac{mg}{l}$ MDL = 32.96 $\frac{mg}{l}$	AML = 3 $\frac{mg}{l}$ MDL = 5 $\frac{mg}{l}$ MIL = 7.5 $\frac{mg}{l}$
Lead	AML = 0.099 $\frac{mg}{l}$ MDL = 0.493 $\frac{mg}{l}$ MIL = 0.740 $\frac{mg}{l}$	AML = 0.377 $\frac{mg}{l}$ MDL = 0.604 $\frac{mg}{l}$	AML = 0.019 $\frac{mg}{l}$ AML = 0.014 $\frac{kg}{d}$ MDL = 0.06 $\frac{mg}{l}$ MDL = 0.044 $\frac{kg}{d}$ MIL = 0.09 $\frac{mg}{l}$ (BPJ)	AML = 0.1 $\frac{mg}{l}$ AML = 0.0203 $\frac{kg}{d}$ MDL = 0.4 $\frac{mg}{l}$ MDL = 0.0408 $\frac{kg}{d}$ MIL = 0.6 $\frac{mg}{l}$
Nickel	AML = 0.986 $\frac{mg}{l}$ MDL = 1.973 $\frac{mg}{l}$ MIL = 2.959 $\frac{mg}{l}$	AML = 2.094 $\frac{mg}{l}$ MDL = 3.50 $\frac{mg}{l}$		AML = 0.97 $\frac{mg}{l}$ AML = 0.489 $\frac{kg}{d}$ MDL = 1.92 $\frac{mg}{l}$ MDL = 0.982 $\frac{kg}{d}$ MIL = 2.88 $\frac{mg}{l}$
O&G	AML = 9.864 $\frac{mg}{l}$ MIL = 19.729 $\frac{mg}{l}$			AML = 10 $\frac{mg}{l}$ MDL = 15 $\frac{mg}{l}$ MIL = 20 $\frac{mg}{l}$
pH		6.0 – 9.0 standard units (40 CFR 433)	6.8 – 8.5 standard units	6.0 – 9.0
Silver	AML = 0.099 mg/l MDL = 0.493 mg/l MIL = 0.740 mg/l	AML = 0.237 mg/l MDL = 0.424 mg/l (40 CFR 433 only)		AML = 0.1 $\frac{mg}{l}$ AML = 0.0105 $\frac{kg}{d}$ MDL = 0.43 $\frac{mg}{l}$ MDL = 0.0211 $\frac{kg}{d}$ MIL = 0.645 $\frac{mg}{l}$
TSS	AML = 19.727 $\frac{mg}{l}$ MDL = 29.594 $\frac{mg}{l}$ MIL = 44.391 $\frac{mg}{l}$	ML = 27.5324 $\frac{mg}{l}$ MDL = 52.918 $\frac{mg}{l}$		AML = 20 $\frac{mg}{l}$ MDL = 30 $\frac{mg}{l}$ MIL = 45 $\frac{mg}{l}$
TTO	MIL = 2.101 mg/l	MIL = 2.13 mg/l (40 CFR 433 only)		MIL = 0.06 $\frac{mg}{l}$
Zinc	AML = 0.986 $\frac{mg}{l}$ MDL = 1.973 $\frac{mg}{l}$ MIL = 2.959 $\frac{mg}{l}$	AML = 1.2981 $\frac{mg}{l}$ MDL = 2.291 $\frac{mg}{l}$	AML = 0.45 $\frac{mg}{l}$ AML = 0.328 $\frac{kg}{d}$ MDL = 1.40 $\frac{mg}{l}$ MDL = 1.018 $\frac{kg}{d}$ MIL = 2.1 $\frac{mg}{l}$ (BPJ)	AML = 0.96 $\frac{mg}{l}$ AML = 0.67 $\frac{kg}{d}$ MDL = 1.91 $\frac{mg}{l}$ MDL = 1.34 $\frac{kg}{d}$ MIL = 2.87 $\frac{mg}{l}$
Note: The highlighted numbers represent the most stringent effluent limits.				

Table 3.9.1: Comparison of Limits Based on Different Criteria				
Pollutants	Adjusted State Limits Based on Section 22a-430-4(s)(2) of the RCSA (See Table 3.2.5)	Adjusted Federal Reg. Limits 40 CFR 433 and 40 CFR 468 Subpart A (Using the combined waste-stream formula) (See Table 3.2.5)	Water Quality-Based Effluent Limits Based on EPA/505/2-90-001 (See Table 3.7.1)	Previous permit limits
AML: Average Monthly Limit, MDL: Maximum Daily Limit, MIL: Maximum Instantaneous Limit,				
BPJ: Best Professional Judgement				

3.10 MONITORING FREQUENCY

RCSA Section 22a-430-3(j) prescribes weekly monitoring for metal finishing and copper forming wastewaters. The sampling frequencies for chromium, copper, iron, nickel, oil and grease, pH, total suspended solids and zinc, contained in the permit are consistent with RCSA Sections 22a-430-3(j)(3). The acute toxicity monitoring is also consistent with RCSA Section 22a-430-3(j). Monthly, quarterly and annual monitoring were included for the rest of pollutants based on Best Professional Judgement and are consistent with the previous permit.

3.11 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

POLLUTANTS	LIMIT	BASIS FOR LIMIT	MONITORING/ REPORTING FREQUENCY
LC50 Static 48 Hr Acute Toxicity, *Daphnia pulex*	≥ 70%	Consistent with RCSA 22a-430-3(j)(7)(B)(i).	Quarterly
LC50 Static 48 Hr Acute Toxicity *Pimephales promelas*	≥ 70%	Consistent with RCSA 22a-430-3(j)(7)(B)(i).	Quarterly
Chronic Aquatic Toxicity (Survival) *Ceriodaphnia dubia*	Monitoring only requirement.	Case-by-case determination using BPJ.	Annually
Chronic Aquatic Toxicity (Reproduction) *Ceriodaphnia dubia*	Monitoring only requirement.	Case-by-case determination using BPJ.	Annually
Chronic Aquatic Toxicity (Survival) *Pimephales promelas*	Monitoring only requirement.	Case-by-case determination using BPJ.	Annually
Chronic Aquatic Toxicity (Growth) *Pimephales promelas*	Monitoring only requirement.	Case-by-case determination using BPJ.	Annually
Aluminum, total	AML = 1.972 mg/l MDL = 3.945 mg/l MIL = 5.918 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula.	Weekly/Monthly
Ammonia as N, total	Monitoring only requirement based on BPJ.	No RP to cause exceedance of WQC.	Quarterly
Biochemical Oxygen Demand (5-day)	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Cadmium, total	AML = 0.099 mg/l MDL = 0.493 mg/l MIL = 0.740 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula.	Quarterly

POLLUTANTS	LIMIT	BASIS FOR LIMIT	MONITORING/ REPORTING FREQUENCY
	AML = 0.0208 kg/d MDL = 0.0418 kg/d	Anti-backsliding Anti-backsliding	
Chlorine, total residual	AML = 0.189 mg/l MDL = 0.408 mg/l MIL = 0.611 mg/l	To meet in-stream WQS To meet in-stream WQS BPJ – multiplied MDL by a factor of 1.5 consistent with RCSA 22a-430-4(s))	Monthly
Chloroform	Monitoring only requirement based on BPJ.	No RP to cause exceedance of WQC.	Quarterly
Chromium, hexavalent	AML = 0.099 mg/l MDL = 0.197 mg/l MIL = 0.296 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula.	Monthly
Chromium, total	AML = 0.670 mg/l MDL = 1.890 mg/l MIL = 2.840 mg/l	To meet in-stream WQS. Anti-backsliding regulations. Anti-backsliding regulations.	Weekly/Monthly
Copper, total	AML = 0.254 mg/l AML = 0.184 kg/d MDL = 0.637 mg/l MDL = 0.463 kg/d MIL = 0.956 mg/l	To meet in-stream WQS. To meet in-stream WQS. To meet in-stream WQS. To meet in-stream WQS. BPJ – multiplied MDL by a factor of 1.5 consistent with RCSA 22a-430-4(s).	Weekly/Monthly
Cyanide, total	AML = 0.641 mg/l MDL = 1.184 mg/l MDL = 1.2 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula. Anti-backsliding regulations.	Annually
Flow rate (Average daily)	192,000 gpd	Permitted discharge flow per application.	Daily/Monthly
Flow, Maximum during 24 hr. period	288,000 gpd	Permitted discharge flow per application.	Daily/Monthly
Fluoride, total	AML = 20 mg/l MDL = 30 mg/l MIL = 45 mg/l	To meet in-stream WQS. To meet in-stream WQS. To meet in-stream WQS.	Quarterly
Iron, total	AML = 2.959 mg/l MDL = 4.932 mg/l MIL = 7.398 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula.	Weekly/Monthly
Kjeldahl Nitrogen, Total (as N)	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Lead, total	AML = 0.019 mg/l AML = 0.014 kg/d MDL = 0.060 mg/l MDL = 0.0408 kg/d	To meet in-stream WQS. To meet in-stream WQS. To meet in-stream WQS. Anti-backsliding regulations.	Monthly

POLLUTANTS	LIMIT	BASIS FOR LIMIT	MONITORING/ REPORTING FREQUENCY
	MIL = 0.090 mg/l	BPJ – multiplied MDL by a factor of 1.5 consistent with RCSA 22a-430-4(s).	
Methylene Chloride	Monitoring only requirement based on BPJ.	No RP to cause exceedance of WQC.	Quarterly
Nickel, total	AML = 0.970 mg/l AML = 0.489 kg/d MDL = 1.920 mg/l MDL = 0.982 kg/d MIL = 2.88 mg/l	Anti-backsliding regulations. Anti-backsliding regulations. Anti-backsliding regulations. Anti-backsliding regulations. Anti-backsliding regulations	Weekly/Monthly
Nitrates (as N)	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Nitrites (as N)	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Oil & Grease, total	AML = 9.860 mg/l MIL = 19.720 mg/l MDL = 15.000 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula. Anti-backsliding regulations.	Weekly/Monthly
pH	6.8 – 8.5	WQC	Weekly/Monthly
Phosphorus, total	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Silver, total	AML = 0.099 mg/l AML = 0.0105 kg/d MDL = 0.424 mg/l MDL = 0.0211 kg/d MIL = 0.645 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula) Anti-backsliding regulations. 40 CFR 433 adjusted limits using combined waste stream formula. Anti-backsliding regulations. Anti-backsliding regulations.	Monthly
Solids, total dissolved	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Solids, total suspended	AML = 19.727 mg/l MDL = 29.590 mg/l MIL = 44.385 mg/l	RCSA 22a-430-4(s) adjusted limits using combined waste stream formula.	Weekly/Monthly
Surfactants, anionic (MBAS)	Monitoring only requirement.	Case-by-case determination using BPJ.	Quarterly
Total Toxic Organics	MIL = 0.060 mg/l	Anti-backsliding regulations.	Monthly
Zinc, total	AML = 0.450 mg/l AML = 0.328 kg/d MDL = 1.400 mg/l MDL = 1.018 kg/d MIL = 2.100 mg/l	To meet in-stream WQS. To meet in-stream WQS. To meet in-stream WQS. To meet in-stream WQS. BPJ – multiplied MDL by a factor of 1.5 consistent with RCSA 22a-430-4(s)).	Weekly/Monthly

POLLUTANTS	LIMIT	BASIS FOR LIMIT	MONITORING/ REPORTING FREQUENCY
AML: Average Monthly Limit	MDL: Maximum Daily Limit	MIL: Maximum Instantaneous Limit	
BPJ: Best Professional Judgment	BPT: Best Practicable Control Technology Currently Available		
RP: Reasonable potential	WQC: Water quality criteria		

3.12 COMPLIANCE SCHEDULE

The permit has a compliance schedule that follows the requirements found under 40 CFR 122.47 and RSCA Section 22a-430-4(l)(3).

DEEP is requiring effluent monitoring for Per- and polyfluoroalkyl substances (PFAS) in certain discharges to support further regulatory evaluations regarding the identification of contributing sources of such substances to the state's surface waters. The Permittee operates under SIC codes 3351 and 3316 and has been identified as a potential source of PFAS in accordance with DEEP's Industrial NPDES and Pretreatment PFAS Roadmap (https://portal.ct.gov/-/media/deep/water_regulating_and_discharges/industrial_wastewater/2023-09-30-wped-pfas-roadmap.pdf).

As such, this permit contains a compliance schedule requiring the Permittee to develop, submit for approval, and implement a PFAS monitoring and sampling plan to ensure data is representative and undergoes proper quality control and assurance. The industrial classification has been identified as a potential source and the effluent will be sampled to characterize the discharge.

3.13 ANTIDEGRADATION

Implementation of the Antidegradation Policy follows a tiered approach pursuant to the federal regulations (40 CFR 131.12) and consistent with the Connecticut Antidegradation Policy included in the Connecticut Water Quality Standards (Section 22a-426-8(b-f) of the RSCA). Tier 1 Antidegradation review applies to all existing permitted discharge activities to all waters of the state. Tiers 1 and 2 Antidegradation reviews apply to new or increased discharges to high quality waters and wetlands, while Tiers 1 and 3 Antidegradation reviews apply to new or increased discharges to outstanding national resource waters.

This discharge is an existing discharge, and the Permittee does not propose an increase in volume or concentration of constituents. Therefore, only the Tier 1 Antidegradation Evaluation and Implementation Review was conducted to ensure that existing and designated uses of surface waters and the water quality necessary for their protection are maintained and preserved, consistent with Connecticut Water Quality Standards, RCSA Sec.22a-426-8(a)(1).

The Tier I review, as documented in Section 3.3 – 3.11 of this fact sheet, involved the following:

- An evaluation of narrative and numeric water quality standards, criteria and associated policies;
- Consideration of the discharge activity both independently and in the context of other dischargers in the affected waterbodies; and
- Consideration of any impairment listed pursuant to Section 303d of the federal Clean Water Act or any TMDL established for the waterbody.

Compliance with all the terms and conditions in the new permit would ensure that existing and designated uses of surface waters and the water quality necessary for their protection are maintained and preserved.

3.14 ANTI-BACKSLIDING

This permit has effluent limitations, standards or conditions that are at least as stringent as the final effluent limitations, standards, or conditions in the previous permit as required in 40 CFR 122.44(l) and RCSA Section 22a-430-4(l)(4)(A)(xxiii).

3.15 CATEGORICAL DISCHARGE CONDITIONS

For Total Toxic Organics (TTO) monitoring, the Permittee may, in lieu of analyzing for TTO, include statement on each DMR certifying compliance with its approved solvent management plan. This certification statement is set forth in 40 CFR 433.12. If such approval had been granted and the reports include the compliance statement, the minimum frequency of sampling shall be reduced to annually in the month of October.

3.16 VARIANCES AND WAIVERS

The facility did not request a variance or a waiver.

3.17 E-REPORTING

The Permittee is required to electronically submit documents in accordance with 40 CFR Part 127.

SECTION 4 SUMMARY OF CHANGES MADE TO NEW PERMIT

The changes made to the permit are as noted below.

- Monitoring requirements are included for aluminum, nitrates, nitrites, and total Kjeldahl nitrogen because they are expected to be present in the wastewater.
- AML, MDL and MIL concentration limits for cadmium, total residual chlorine, total chromium, hexavalent chromium, copper, iron, silver, and total suspended solids were changed (see Table 3.9.1 and Section 3.11 of the fact sheet).
- AML, MDL and MIL concentration and mass limits for lead and zinc were changed (see Table 3.9.1 and Section 3.11 of the fact sheet).
- AML and MDL concentration limits were added for cyanide (see Table 3.9.1 and Section 3.11 of the fact sheet).
- MIL for pH was changed from 6.0 – 9.0 to 6.8 – 8.5 S.U. consistent with the water quality criteria for a class B waterbody.
- Inclusion of compliance schedules requiring the Permittee to achieve compliance with the pH effluent limitations in Section 5 of the proposed permit, and develop, submit for approval, and implement a PFAS monitoring.

A review of the discharge monitoring reports from 2019 to 2023 showed that the Permittee can meet the proposed effluent limits except for pH. Changes in pH of treated wastewater could impact the removal of metals in wastewater, therefore, a 12-month period compliance schedule was included in the permit to provide enough time for the Permittee to evaluate and decide on the treatment option that will ensure compliance with the pH limits of 6.8 – 8.5 S.U.

SECTION 5 PUBLIC PARTICIPATION PROCEDURES

5.1 INFORMATION REQUESTS

The application has been assigned the following numbers by the Department of Energy and Environmental Protection. Please use these numbers when corresponding with this office regarding this application.

APPLICATION NO. 201406851 PERMIT ID NO. CT0021873

Interested persons may obtain copies of the application from Dean Stoddart, 215 Piedmont Street, Waterbury, CT 06706, (203) 346-6362 or Dean.Stoddart@wieland.com.

The application is available for inspection by contacting Oluwatoyin Fakilede at oluwatoyin.fakilede@ct.gov, at the Department of Energy and Environmental Protection, Bureau of Materials Management and Compliance Assurance, 79 Elm Street, Hartford, CT 06106-5127 from 8:30 - 4 :30, Monday through Friday.

Any interested person may request in writing that his or her name be put on a mailing list to receive notice of intent to issue any permit to discharge to the surface waters of the state. Such request may be for the entire state or any geographic area of the state and shall clearly state in writing the name and mailing address of the interested person and the area for which notices are requested.

5.2 PUBLIC COMMENT

Prior to making a final decision to approve or deny any application, the Commissioner shall consider written comments on the application from interested persons that are received within 30 days of this public notice. Written comments should be directed to Oluwatoyin Fakilede, Bureau of Materials Management and Compliance Assurance, Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT 061065127 or oluwatoyin.fakilede@ct.gov. The Commissioner may hold a public hearing prior to approving or denying an application if in the Commissioner's discretion the public interest will be best served thereby and shall hold a hearing upon receipt of a petition signed by at least twenty-five (25) persons. Notice of any public hearing shall be published at least thirty (30) days prior to the hearing.

Petitions for a hearing shall be submitted within thirty (30) days from the date of publication of this public notice and should include the application number noted above and also identify a contact person to receive notifications. Petitions may also identify a person who is authorized to engage in discussions regarding the application and, if resolution is reached, withdraw the petition. The Office of Adjudications will accept electronically-filed petitions for hearing in addition to those submitted by mail or hand-delivered. Petitions with required signatures may be sent to deep.adjudications@ct.gov; those mailed or delivered should go to the DEEP Office of Adjudications, 79 Elm Street, Hartford, CT 06106. If the signed original petition is only in an electronic format, the petition must be submitted with a statement signed by the petitioner that the petition exists only in that form. Original petitions that were filed electronically must also be mailed or delivered to the Office of Adjudications within 30 days of electronic submittal. Additional information can be found at www.ct.gov/deep/adjudications.

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act (ADA). If you are seeking a communication aid or service, have limited proficiency in English, wish to file an ADA or Title VI discrimination complaint, or require some other accommodation, including equipment to facilitate virtual participation, please contact the DEEP Office of Diversity and Equity at 860-418-5910 or by email at deep.accommodations@ct.gov. Any person needing an accommodation for hearing impairment may call the State of Connecticut relay number - 711. In order to facilitate efforts to provide accommodation, please request all accommodations as soon as possible following notice of any agency hearing, meeting, program, or event.

ATTACHMENT A

Average Daily Precipitation Based on New Haven County Precipitation Data

Naugatuck station is the closest to the Wieland facility.
5-year precipitation = 272.61 inches, 5 years = (365 + 366 + 365 + 365 + 365) days = 1826 days
Average daily precipitation = 272.61 ÷ 1826 = 0.1493 ≈ 0.15 inches
0.15 inches ÷ 12 = 0.0125 ft
The holding tank has a diameter of 18 feet: radius = diameter/2 = 9 ft
Total volume V= πr^2h where r is the radius of the holding tank and h is the precipitation in ft.
Volume = $\frac{22}{7}$ X 9 X 9 X 0.0125 = 3.182 ft^3 X 7.48 = 23.8 gallons ≈ 24 gallons.

View Data : Station Report Summary US Units

Station Report Summary	
Station 1 :	CT-NH-43 Example: CO-LR-273
Station 2 :	CT-NH-45
Station 3 :	Ct-NH-75
Start Date: 1/1/2019	End Date: 12/31/2023
	Get Summary

Stations:		
CT-NH-43 Wallingford Center 3.3 NNW Lat: 41.49109 Lon: -72.85065	CT-NH-45 Naugatuck 1.7 NNE Lat: 41.511 Lon: -73.036959	CT-NH-75 Meriden 2.8 WSW Lat: 41.525841 Lon: -72.846985

* indicates Multi-Day Accumulation Report

Station	CT-NH-43	CT-NH-45	CT-NH-75
Date	Precip in.	Precip in.	Precip in.
12/29/2023	0.07	0.18	0.84
12/30/2023	0.01	0.04	0.08
12/31/2023	T	0.03	0.01
Totals :	275.79 in.	272.61 in.	191.47 in.

CoCoRaHS - Community Collaborative Rain, Hail & Snow Network

ATTACHMENT B
FEDERAL AND STATE EFFLUENT LIMITATIONS
Regulations of Connecticut State Agencies Section 22a -430-4(s)(2)

Parameter	Allowable Effluent Concentrations (mg/l)		
	Average Monthly	Maximum Daily	Maximum Instantaneous
Aluminum	2.0	4.0	6.0
Cadmium	0.1 (0.07)	0.5 (0.11)	0.75
Chromium, Hexavalent	0.1	0.2	0.3
Chromium, Total	1.0	2.0	3.0
Copper	1.0	2.0	3.0
Cyanide, Amenable	0.1	0.2	0.3
Cyanide, Total	0.65	1.2	-
Iron	3.0	5.0	7.5
Lead	0.1	0.5	0.75
Nickel	1.0	2.0	3.0
Silver	0.1	0.5	0.75
Zinc	1.0	2.0	3.0
Total Suspended Solids	20.0	30.0	45.0
Oil and Grease	10.0	-	20.0

Federal limits are based on 40 CFR 433, Metal Finishing

BPT and BAT Effluent Limitations

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified above:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

BPT Effluent Limitations Continued

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Oil & Grease	52	26
TSS	60	31
pH	([1])	([1])

[1] Within 6.0 to 9.0.

<u>Federal limits are based on 40 CFR 468, Copper Forming</u>
<u>(7500 lbs = 3402 kg of copper strip per day)</u>

Subpart A - Pickling Rinse BPT Effluent Limitations.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units - mg/off-kg of copper or copper alloy pickled English units - pounds per/1,000,000 off-pounds of copper or copper alloy pickled	
Chromium	1.593	0.651
Copper	6.881	3.622
Lead	0.543	0.470
Nickel	6.954	4.599
Zinc	5.288	2.209
Oil and grease	72.440	43.464
TSS	148.502	70.629
pH	([1])	([1])

Subpart A - Pickling Bath BPT Effluent Limitations.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units - mg/off-kg of copper or copper alloy pickled English units - pounds per 1,000,000 off-pounds of copper or copper alloy pickled	
Chromium	0.051	0.020
Copper	0.220	0.116
Lead	0.017	0.015
Nickel	0.222	0.147
Zinc	0.169	0.070
Oil and grease	2.320	1.392
TSS	4.756	2.262
pH	([1])	([1])

Subpart A - Pickling Fume Scrubber BPT Effluent Limitations.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units - mg/off-kg of copper or copper alloy pickled English units - pounds per 1,000,000 off-pounds of copper or copper alloy pickled	
Chromium	0.275	0.112
Copper	1.189	0.626
Lead	0.093	0.081
Nickel	1.201	0.795
Zinc	0.913	0.381
Oil and grease	12.520	7.512
TSS	25.666	12.207
pH	([1])	([1])

[1] Within the range of 7.5 to 10.0 at all times.

Subpart A - Pickling Rinse BAT Effluent Limitations.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric Units - mg/off-kg of copper or copper alloy pickled English Units - pounds per 1,000,000 off-pounds of copper or copper alloy pickled	
Chromium	0.574	0.235
Copper	2.481	1.306
Lead	0.195	0.169
Nickel	2.507	1.658
Zinc	1.906	0.796

Subpart A - Pickling Bath BAT Effluent Limitations.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units - mg/off-kg of copper or copper alloy pickled English units - pounds per 1,000,000 off-pounds of copper or copper alloy pickled	
Chromium	0.051	0.020
Copper	0.220	0.116
Lead	0.017	0.015
Nickel	0.222	0.147
Zinc	0.169	0.070

Subpart A - Pickling Fume Scrubber BAT Effluent Limitations.

Pollutant or pollutant property	Maximum for any 1 day	Maximum for monthly average
	Metric units - mg/off-kg of copper or copper alloy pickled English units - pounds per 1,000,000 off-pounds of copper or copper alloy pickled	
Chromium	0.275	0.112
Copper	1.189	0.626
Lead	0.093	0.081
Nickel	1.201	0.795
Zinc	0.913	0.381

ATTACHMENT C

Reasonable Potential Statistical Multiplier (Table 3-1 of TSD EPA/505/2-90-001)

Table 3-1. Reasonable Potential Multiplying Factors: 99% Confidence Level and 99% Probability Basis

Number of	Coefficient of Variation																			
Samples	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
1	1.6	2.5	3.9	6.0	9.0	13.2	18.9	26.5	36.2	48.3	63.3	81.4	102.8	128.0	157.1	190.3	227.8	269.9	316.7	368.3
2	1.4	2.0	2.9	4.0	5.5	7.4	9.8	12.7	16.1	20.2	24.9	30.3	36.3	43.0	50.4	58.4	67.2	76.6	86.7	97.5
3	1.4	1.9	2.5	3.3	4.4	5.6	7.2	8.9	11.0	13.4	16.0	19.0	22.2	25.7	29.4	33.5	37.7	42.3	47.0	52.0
4	1.3	1.7	2.3	2.9	3.8	4.7	5.9	7.2	8.7	10.3	12.2	14.2	16.3	18.6	21.0	23.6	26.3	29.1	32.1	35.1
5	1.3	1.7	2.1	2.7	3.4	4.2	5.1	6.2	7.3	8.6	10.0	11.5	13.1	14.8	16.6	18.4	20.4	22.4	24.5	26.6
6	1.3	1.6	2.0	2.5	3.1	3.8	4.6	5.5	6.4	7.5	8.6	9.8	11.1	12.4	13.8	15.3	16.8	18.3	19.9	21.5
7	1.3	1.6	2.0	2.4	2.9	3.6	4.2	5.0	5.8	6.7	7.7	8.7	9.7	10.8	12.0	13.1	14.4	15.6	16.9	18.2
8	1.2	1.5	1.9	2.3	2.8	3.3	3.9	4.6	5.3	6.1	6.9	7.8	8.7	9.6	10.6	11.6	12.6	13.6	14.7	15.8
9	1.2	1.5	1.8	2.2	2.7	3.2	3.7	4.3	5.0	5.7	6.4	7.1	7.9	8.7	9.6	10.4	11.3	12.2	13.1	14.0
10	1.2	1.5	1.8	2.2	2.6	3.0	3.5	4.1	4.7	5.3	5.9	6.6	7.3	8.0	8.8	9.5	10.3	11.0	11.8	12.6
11	1.2	1.5	1.8	2.1	2.5	2.9	3.4	3.9	4.4	5.0	5.6	6.2	6.8	7.4	8.1	8.8	9.4	10.1	10.8	11.5
12	1.2	1.4	1.7	2.0	2.4	2.8	3.2	3.7	4.2	4.7	5.2	5.8	6.4	7.0	7.5	8.1	8.8	9.4	10.0	10.6
13	1.2	1.4	1.7	2.0	2.3	2.7	3.1	3.6	4.0	4.5	5.0	5.5	6.0	6.5	7.1	7.6	8.2	8.7	9.3	9.9
14	1.2	1.4	1.7	2.0	2.3	2.6	3.0	3.4	3.9	4.3	4.8	5.2	5.7	6.2	6.7	7.2	7.7	8.2	8.7	9.2
15	1.2	1.4	1.6	1.9	2.2	2.6	2.9	3.3	3.7	4.1	4.6	5.0	5.4	5.9	6.4	6.8	7.3	7.7	8.2	8.7
16	1.2	1.4	1.6	1.9	2.2	2.5	2.9	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.1	6.5	6.9	7.3	7.8	8.2
17	1.2	1.4	1.6	1.9	2.1	2.5	2.8	3.1	3.5	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.6	7.0	7.4	7.8
18	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.4	3.7	4.1	4.4	4.8	5.2	5.6	5.9	6.3	6.7	7.0	7.4
19	1.2	1.4	1.6	1.8	2.1	2.4	2.7	3.0	3.3	3.6	4.0	4.3	4.6	5.0	5.3	5.7	6.0	6.4	6.7	7.1
20	1.2	1.3	1.6	1.8	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8	5.2	5.5	5.8	6.1	6.5	6.8

ATTACHMENT D
WLA Statistical Multipliers from (Table 5-1 of TSD EPA/505/2-90-001)

Table 5-1. Back Calculations of Long-Term Average

CV	WLA Multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 95th Percentile	WLA Multipliers $e^{[0.5\sigma^2 - z\sigma]}$ 99th Percentile
0.1	0.853	0.797
0.2	0.736	0.643
0.3	0.644	0.527
0.4	0.571	0.440
0.5	0.514	0.373
0.6	0.468	0.321
0.7	0.432	0.281
0.8	0.403	0.249
0.9	0.379	0.224
1.0	0.360	0.204
1.1	0.344	0.187
1.2	0.330	0.174
1.3	0.319	0.162
1.4	0.310	0.153
1.5	0.302	0.144
1.6	0.296	0.137
1.7	0.290	0.131
1.8	0.285	0.126
1.9	0.281	0.121
2.0	0.277	0.117

Acute

$$LTA_{a,c} = WLA_{a,c} \cdot e^{[0.5\sigma^2 - z\sigma]}$$

where $\sigma^2 = ln[CV^2 + 1]$,
z = 1.645 for 95th percentile occurrence probability, and
z = 2.326 for 99th percentile occurrence probability

Chronic
(4-day average)

$$LTA_c = WLA_c \cdot e^{[0.5\sigma_4^2 - z\sigma_4]}$$

where $\sigma_4^2 = ln[CV^2/4 + 1]$,
z = 1.645 for 95th percentile occurrence probability, and
z = 2.326 for 99th percentile occurrence probability

CV	WLA Multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 95th Percentile	WLA Multipliers $e^{[0.5\sigma_4^2 - z\sigma_4]}$ 99th Percentile
0.1	0.922	0.891
0.2	0.853	0.797
0.3	0.791	0.715
0.4	0.736	0.643
0.5	0.687	0.581
0.6	0.644	0.527
0.7	0.606	0.481
0.8	0.571	0.440
0.9	0.541	0.404
1.0	0.514	0.373
1.1	0.490	0.345
1.2	0.468	0.321
1.3	0.449	0.300
1.4	0.432	0.281
1.5	0.417	0.264
1.6	0.403	0.249
1.7	0.390	0.236
1.8	0.379	0.224
1.9	0.369	0.214
2.0	0.360	0.204

ATTACHMENT E
LTA Statistical Multipliers from (Table 5-2 of TSD EPA/505/2-90-001)

Table 5-2. Calculation of Permit Limits

Maximum Daily Limit

$$MDL = LTA \cdot e^{[z\sigma - 0.5\sigma^2]}$$

where $\sigma^2 = ln[CV^2 + 1]$,
$z = 1.645$ for 95th percentile occurrence probability, and
$z = 2.326$ for 99th percentile occurrence probability

CV	LTA multipliers $e^{[z\sigma - 0.5\sigma^2]}$	
	95th Percentile	99th Percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.90
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1.0	2.78	4.90
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2.0	3.60	8.55

Average Monthly Limit

$$AML = LTA \cdot e^{[z\sigma_n - 0.5\sigma_n^2]}$$

where $\sigma_n^2 = ln[CV^2/n + 1]$,
$z = 1.645$ for 95th percentile,
$z = 2.326$ for 99th percentile, and
n = number of samples/month

CV	LTA Multipliers $e^{[z\sigma_n - 0.5\sigma_n^2]}$									
	95th Percentile					99th Percentile				
	n=1	n=2	n=4	n=10	n=30	n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.06	1.06	1.03	1.25	1.18	1.12	1.06	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.55	1.37	1.25	1.16	1.09
0.3	1.55	1.38	1.26	1.18	1.09	1.90	1.59	1.40	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.95	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.80	1.55	1.38	1.19	3.11	2.37	1.90	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
0.9	2.64	2.20	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
1.0	2.78	2.33	1.95	1.66	1.33	4.90	3.59	2.68	1.96	1.50
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.90	2.07	1.56
1.2	3.03	2.56	2.13	1.80	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.40	2.00	1.50	6.93	5.17	3.78	2.58	1.80
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.10	2.64	2.20	1.61	7.95	6.06	4.46	2.98	2.00
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2.0	3.60	3.23	2.78	2.33	1.68	8.55	6.61	4.90	3.26	2.14