

Application Type Renewal
Facility Type Industrial
Major / Minor Minor

**NPDES PERMIT FACT SHEET
ADDENDUM**

Application No. PA0004219
APS ID 1060371
Authorization ID 1391030

Applicant and Facility Information

Applicant Name	<u>Langeloth Metallurgical Co. LLC</u>	Facility Name	<u>Langeloth Metallurgical Plant</u>
Applicant Address	<u>PO Box 608</u> <u>Langeloth, PA 15054-0608</u>	Facility Address	<u>10 Langeloth Plant Drive Main Street</u> <u>Langeloth, PA 15054</u>
Applicant Contact	<u>Matthew Lucas</u>	Facility Contact	<u>Matthew Lucas</u>
Applicant Phone	<u>(724) 947-2201</u>	Facility Phone	<u>(724) 947-2201</u>
Client ID	<u>79366</u>	Site ID	<u>500111</u>
SIC Code	<u>1061,2819,3313</u>	Municipality	<u>Smith Township</u>
SIC Description	<u>Manufacturing - Electrometallurgical Products, Manufacturing - Industrial Inorganic Chemicals, NEC, Mining - Ferroalloy Ores, Except Vanadium</u>	County	<u>Washington</u>
Date Published in PA Bulletin	<u>March 11, 2023</u>	EPA Waived?	<u>Yes</u>
Comment Period End Date	<u>April 10, 2023</u>	If No, Reason	<u></u>
Purpose of Application	<u>Application for a renewal of an NPDES permit for discharge of treated Industrial and stormwater.</u>		

Internal Review and Recommendations

On February 24, 2023, the Draft NPDES permit PA0004219 for The Langeloth Metallurgical Company, LLC– Langeloth Metallurgical Plant was sent via electronic mail to Matthew Lucas. Public notice of the Draft permit was published in the PA Bulletin on March 11, 2023. The 30-day public comment period expired on April 10, 2023.


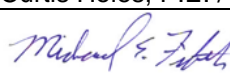
On March 31, 2023, the Department received comments to the Draft Permit PA0004219 and supplemental monitoring data for the Langeloth Metallurgical Plant via electronic mail from Matthew Lucas.

Question A. Outfall 301 – Selenium Effluent Limitations

The draft permit imposes new water quality based effluent limitations (WQBELs) at Outfall 301 for selenium, while the current permit contains report only sampling requirements for selenium. LMC provides the following three comments regarding this newly imposed limit.

Question A.1: Since the proposed limitations are newly added WQBELs, LMC should receive a schedule of compliance to determine whether these proposed limitations can be achieved.

Selenium should be added to the table in Part C, Section II.A that would provide a three-year period from the permit effective date for the WQBELs to become effective. During this three-year period, LMC would carry out a TRE to determine if LMC will be able to achieve the WQBELs. LMC would also examine whether further reduction of selenium in Outfall 301 can be achieved and complete appropriate site-specific data collection and reporting, as referenced in Part C.II.B-D, if it is deemed that such site-specific data collection is required (see comment in Section D below).

Approve	Return	Deny	Signatures	Date
X			 Curtis Holes, P.E. / Environmental Engineer	August 16, 2023
X			 Michael E. Fifth, P.E. / Environmental Engineer Manager	October 20, 2023

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Department Response to Comment A.1

When a more stringent WQBEL monitoring requirement is imposed a TRE is included in Part C of the NPDES Permit to allow the facility time to evaluate operations (process and treatment) to achieve the new more stringent WQBELs. The new more stringent WQBEL for Selenium is discussed in Question A.2, below.

No change was made to the Draft Permit pertaining to this comment.

Question A.2: LMC is already using BDAT for selenium treatment to be iron co-precipitation.

EPA has defined BDAT for selenium treatment to be iron co-precipitation. This technology is also the preferred EPA technology for arsenic removal. LMC recently installed this technology under a Department TRE program for arsenic that was completed in 2022. LMC believes that the existing, installed Liquid Effluent Treatment (LET) process, which contains oxidation, sulfide precipitation, iron co-precipitation, alkaline neutralization and filtration is BDAT for reduction of selenium in IMP 301. LMC will provide further information to support this conclusion during the three-year TRE period, as noted below.

Selenium is one of the trace metals that is contained in molybdenum concentrates that LMC roasts, and as with our previous review of arsenic as a trace metal in concentrates, selective roasting of concentrates is not likely to result in reduction of selenium in IMP 301. This is due to fact that most concentrates contain varying concentrations of selenium, so elimination of certain concentrates is not cost effective nor practical for LMC.

During the evaluation period allowed for in the TRE on selenium, LMC will develop a work plan that will explore several factors related to selenium in the LET circuit. First, the accuracy and precision of the current analytical techniques utilized by Microbac will be reviewed to confirm that the historic selenium concentrations are indeed an accurate representation of contained selenium. Secondly, LMC will develop information that provides for tracking of selenium from the acid plant wash tower solution, through the LET process to the discharge point, IMP 301. This will provide a benchmark as to current effectiveness of the existing LET treatment process in removing selenium. Thirdly, LMC will complete a literature review on selenium removal technologies to confirm that BDAT is still considered to be iron co-precipitation and to identify preferred operating conditions utilizing this technology. Finally, it will be determined if the operating conditions that LMC employs in the currently installed iron co-precipitation process are consistent with those conditions as noted by EPA. A prime concern in evaluating appropriate operating conditions for the LMC iron co-precipitation process is making sure that any operating changes that might be suggested to reduce selenium do not compromise effective removal of arsenic.

Department Response to Comment A.2

The Department acknowledges the comment. During the Draft Permit Response process, the Department has noticed that the Outfall 301 concentration for Total Selenium has dramatically decreased since March 2023. The Permit renewal application identified the Total Selenium concentration of 980 µg/L. The Outfall 301 Total Selenium concentration range since March 2023 is 5 to 10 µg/L.

On August 9, 2023, the Department reached out to Langeloth, via electronic mail, to see what the facility has changed (source material or treatment system changes) to decrease the Total Selenium. On August 10, 2023, Langeloth stated that the source material has not changed since the permit renewal application. The facility has started fine tuning of the ferric sulfate treatment process trying to optimize Arsenic removal.

The facility started precoating the gypsum press. Precoating is a pretreatment process where, prior to filtration, filter cloths are coated with a layer of porous, inert material. Common precoat materials are diatomaceous earth (DE), perlite, and cellulose. The precoat layer adds an extra filtration layer increasing the removal efficiency along with prolonging the life of the filter cloths. The precoating has increased the removal efficiency for both Total Arsenic and Total Selenium.

Since adding the precoating step to the treatment process, the treated effluent peak concentration was 10 µg/L Total Selenium. Total Selenium was reevaluated using the 10 µg/L in the TMS model to determine the updated reasonable potential. The TMS model recommends Monitor and Report for Total Selenium with the updated Total Selenium

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concentration. Refer to Attachment A for the Revised TMS Model.

Monitor and Report for Total Selenium was previously imposed in the existing permit. Since the Final Effluent Limitation for Total Selenium remains unchanged from previously permitted there is no longer a need to add the TRE permit condition to the Draft Permit.

One (1) Change to the Draft Permit pertaining to this comment was completed, the final effluent limitation of Total Selenium for Outfall 301 was reverted to the previously imposed Monitor and Report monitoring requirement.

Question A.3: Typographical Clarification

For clarification only, Page 34, Table 11 of the Fact Sheet lists the “WQBEL (mg/l)” monthly average concentration for Total Selenium as “0.812.” However, all other pages of the Fact Sheet report Total Selenium at 0.0812, and the table at Part A.I.H for Outfall 301 identifies the average monthly limit at “0.081 mg/l.” It appears that the selenium concentration listed on Table 11 of the Fact Sheet includes a typographical error.

Department Response to Comment A.3

The Fact Sheet for the Draft Permit contained a typographical error on Table 11. Table 11 identifies the Total Selenium as 0.812 ^{mg}/_L for Average Monthly effluent limitation. The correct Total Selenium Average Monthly effluent limitation of 0.081 ^{mg}/_L as documented in Table 10 of the Draft Permit Fact Sheet and as contained in Part A.I.H of the Draft Permit.

Response to Comment A.2 evaluated the updated reasonable potential of Total Selenium and reverted the final effluent limitation to Monitoring and Report, as previously imposed.

No Changes to the Draft Permit pertaining to this comment.

Question B. Resampling of Certain Outfall 301 Parameters

As allowed by the Department, LMC is resampling for certain parameters at Outfall 301 and may subsequently request removal of certain parameters from the final permit. Specifically, for Outfall 301, the Department has added WQBELs for Hexavalent Chromium; Bis(2-Ethylhexyl)Phthalate; 3,3-Dichlorobenzidene; Hexachlorobutadiene; and 1,2,4- Trichlorobenzene; and a report only obligation for 4,6-dinitro-o-cresol. Analyses for these parameters historically, and in the required pre-permit sampling, were found at non-detect concentrations below the Reportable Limit calculated by LMC’s certified laboratory, Microbac. However, as noted by DEP in the Fact Sheet, these non-detect concentrations were above the Department’s Target Quantification Limits (QLs) (40 CFR 122.44(i)(1)(iv). In the Fact Sheet, the Department allows Langeloth the opportunity to resample these parameters during the 30-day draft permit comment period. The Department also notes that “if the new analytical results verify that the parameters are not present in [LMC’s] wastewater discharge at the Department’s minimum quantification limits, effluent limitations/monitoring requirements for these pollutants may be eliminated prior to Final permit issuance.”

As allowed by the Department, LMC has resampled Outfall 301 for these parameters, and Microbac has assured LMC that the Microbac Reportable Limits levels for these parameters will align with the DEP Target QLs. Because, as noted in previous discussions with DEP, analytical turnaround times are lengthy, LMC is requesting that the comment period be extended for an additional 15 days beyond the April 10, 2023 deadline so as to allow for submission of the analytical results for these 6 parameters.

Department Response to Comment B

The additional sample data of the parameters that had results of “non-detect” above the Department’s Target Quantitative Limits were added to the TMS model to determine the reasonable potential (RP) of the parameters. Below is a summary table of the updated monitoring results and the TMS output recommendations.

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Table 1. Updated TMS model for Outfall 301

Parameter	Updated Sample Result (mg/L)	TMS Recommendation
Hexavalent Chromium	<0.00025	No RP
4,6-dintro-o-cresol	<0.010	No RP
3,3-Dichlorobenzidienne	<0.005	No RP
Bis(2-Ethylhexyl)Phthalate	<0.005	No RP
1,2,3,4- Trichlorobenzene	<0.0005	No RP
Hexachlorobutadiene	<0.0005	No RP

With no RP, the six (6) parameters (Hexavalent Chromium, 4,6-dintro-o-cresol, 3,3-Dichlorobenzidienne, Bis(2-Ethylhexyl)Phthalate, 1,2,4- Trichlorobenzene, and Hexachlorobutadiene) will be removed from the self-monitoring requirements.

Six (6) changes to the Draft Permit were completed pertaining to this comment, Hexavalent Chromium, 4,6-dintro-o-cresol, 3,3-Dichlorobenzidienne, Bis(2-Ethylhexyl)Phthalate, 1,2,4- Trichlorobenzene, and Hexachlorobutadiene were all removed from Outfall 301's self-monitoring requirements of Part A of the Draft Permit.

Question C. Outfall 301 – Copper Effluent Limitation

Copper is one of the EPA listed BAT parameters under the Metallurgical Acid Plant and Nonferrous Metals Manufacturing categories., and as such, a technology-based loading limitation should be included in the discharge permit for this parameter for Outfall 301.

For other BAT listed parameters, such as lead and zinc, the Department has included a mass limitation and not a concentration limitation. However, for copper, both mass and concentration limitations are proposed as WQBELs. LMC's LET system has been very effective at reducing those parameters that form sulfide compounds such as zinc, lead and copper. LMC's historic removal performance for copper confirms that there is not a reasonable potential that the discharge will cause or contribute to an exceedance of the applicable water quality standard for copper. In fact, based on the data provided in the Fact Sheet, concentrations of copper detected at Outfall 003 are at least an order of magnitude below the proposed WQBEL. For these reasons, and to align the handling of copper limitations to be consistent with the other BAT parameters, LMC requests that the concentration limitations for copper be changed to report only.

Department Response to Comment C

The renewal application listed Outfall 301 as having a Total Copper concentration of 1.2 mg/L, while historic eDMR data for Outfall 301 Total Copper concentrations are less than 10 µg/L. The lab data attached to the renewal application have the three (3) samples for Outfall 301 all reporting Total Copper concentrations as <0.1 mg/L. The lab had to dilute the samples, which decreased the detection limit of the test. A typo was also included on the renewal application data summary table.

Review of eDMR concentrations, from September 2018 to July 2023, indicate 0.050 mg/L as the highest Total Copper result. Outfall 301 is subject to an ELG which has a TBEL of 0.75 lbs/day monthly average and 1.5 lbs/day daily maximum. The TMS model for Outfall 301 was updated to use the 0.050 mg/L concentration to determine if Total Copper has a reasonable potential to exceed WQ criteria and would require a WQBEL. The revised TMS model does not recommend a WQBEL for Total Copper concentration of 0.050 mg/L monthly average; therefore, the TBEL from the ELG will be reimposed.

One (1) change to the Draft Permit were completed pertaining to this comment, the TBELs from the ELG are reimposed for Total Copper (0.75 lbs/day monthly average and 1.5 lbs/day daily maximum).

Question D. Site-Specific Data Requirements – Clarification

On Page 27 of the draft permit, LMC is required to "collect site-specific data for all of the parameters listed below" However, no parameters are listed below in that section of the draft permit. Please clarify that the referenced parameters are those listed in Part C.II.A, as may be amended in the final permit based on LMC's comments and resampling efforts.

Secondly, please clarify that LMC will not be required to develop site-specific data collection requirements of Part C.II.B, if a

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TRE is undertaken by LMC. This requirement appears to be optional based upon the language contained in Part C.II.D.2.b, which begins “If the permittee is requesting a modification to the final WQBEL’s based on site-specific data, . . . ” This provision is consistent with LMC’s existing permit, in which developing site specific data was an option as noted on page 30 of that permit.

Department Response to Comment D

Permit condition Part C, II.B Site-Specific Data Collection Studies states “*The WQBELs were developed by DEP using the default or model-derived estimates for the parameters listed below in the DEP’s Toxics Management Spreadsheet (TMS). The permittee shall collect site-specific data for all of the parameters listed below and submit the data to DEP as part of the Final WQBEL Compliance Report.*” The permit condition then identifies seven (7) parameters that impact the TMS and WQBEL recommendations (1. Discharge pollutant concentration coefficients of variability, 2. Discharge and background hardness concentrations, 3. Background / ambient pollutant concentrations, 4. Chemical translator(s), 5. The slope and width of the receiving waters, 6. The velocity of the receiving waters, and 7. The acute and chronic partial mix factors).

The collection of site-specific data is to ensure that the correct protective WQBEL is imposed. The permit renewal is no longer proposing more stringent WQBELs so Part C, II.B and the need for a TRE is no longer required. The above comment responses contained in this Addendum Fact Sheet have removed the need to impose more stringent WQBELs contained in the Draft Permit.

No Changes to the Draft Permit were completed pertaining to this comment.

Question E. Lead and Copper Corrosion Control Feasibility Study

Part C.II.C.4 of the draft permit is requiring that LMC implement a “Lead and Copper Corrosion Control Feasibility Study” as part of the TRE. LMC requests that this requirement be deleted as LMC’s LET system is very effective at removing both copper and lead to levels well below both BAT limitations and WQBELs. Copper and lead that are present in the Weak Acid stream and that are treated in the LET process are likely due to being contained in concentrates that are roasted in the plant and not due to corrosion in the water handling system.

Department Response to Comment E

Since a more stringent WQBEL is not being imposed, Part C.II.C.4 of the draft permit is being removed. Above comment response to Question C contained in this Addendum Fact Sheet, details that the previously imposed Total Copper Limits are being maintained in this renewal permit.

No Changes to the Draft Permit were completed pertaining to this comment.

Question F. Thallium

LMC is requesting that monitoring for thallium be removed from the Outfall 301 Effluent Limitation table of the draft permit. A comprehensive analytical and mass balance study was completed by LMC and acknowledged by the Department. The study demonstrates that thallium is not a parameter of concern and should not have been included in the next permit cycle (i.e., the subject draft permit). The study is referenced in the PA DEP – Initiated Fact Sheet Addendum regarding the Modification of a site-specific MDL for thallium. See attached Fact Sheet.

Department Response to Comment F

The 2017 permit required Langeloth to complete a Toxics Reduction Evaluation (TRE) for Total Thallium. Langeloth evaluated Thallium liquid concentration results at various points throughout the treatment system and found them to be generally below the analytical method detection limit of 0.1 mg/L. If thallium was present in the liquid feed to the LET, one would expect both the sulfide and magnesium hydroxide cakes to have elevated levels of thallium, since the metals are expected to settle out in the treatment process. The analytical results for the two cakes yielded <0.1 mg/L. Langeloth evaluated their eight (8) mine sources and the raw material thallium concentrations ranged from 1 to 5 parts per million. Since thallium is not concentrating in the LET system cakes, and not present at significant levels within their raw materials, there is no evidence to suggest that thallium is a parameter of concern for IMP 301.

During the previous permit cycle, pollutant matrix interference was identified due to increased peak readings of Thallium. To

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evaluate the matrix interference, Microbac conducted the Maximum Detection Limit (MDL) study. The study determined that the thallium detection limit of test method EPA 200.7; accounting for the matrix interference in the wastewater is 1.0 mg/L. The test method EPA 200.7 MDL for thallium at 1.0 mg/L means that when analytical results yield a non-detect result, thallium is not present in the wastewater or in the treatment system filter cakes. The facility's NPDES permit condition, Part C II.C.4 allows for the permittee to develop a site-specific alternative MDL to account for analytical matrix interference associated with the wastewater discharges.

The mass balance analysis, along with the analytical results since May 2019, have documented that previous Total Thallium detections have been due to analytical matrix interference cause by sulfide minerals, magnesium and/or other parameters, and not thallium's actual presence in the discharge. Accordingly, the Department has concluded that Total Thallium has no reasonable potential to exceed water quality criteria and is removed from Part A monitoring requirements for Outfall 301.

One (1) change to the Draft Permit was completed pertaining to this comment. The Total Thallium monitoring requirements of Part A for Outfall 301 are removed.

Question G. Calculation of Flow

For Outfall 001, LMC requests flows be permitted to be calculated, as the facility does not have a flow meter for Outfall 001. The flow to Outfall 001 can easily and reliably be calculated from summing the flows from Outfall 301, Outfall 201, and Outfall 101.

Department Response to Comment G

During the previous permit cycle, the Required Sample Type for Outfall 001 was imposed as "Calculated". The Required Sample Type for flow at Outfall 001 has been corrected to "Calculated".

One (1) change to the Draft Permit was completed pertaining to this comment, the Outfall 001 Required Sample Type has been corrected to "Calculated".

Question H. Zinc

The Department is aware of the legacy zinc plant that is located adjacent to LMC's property. Remediation of the Zinc Plant site over the past couple of years has likely contributed to observed increased zinc levels in stormwater runoff in the local area, and in particular, at Outfall 006. PADEP has noted on page 42 of the Fact Sheet that the high level of zinc in Outfall 006 "is expected due to residual zinc in the soil from a pre-existing zinc smelter nearby." It is further noted that the Consent Order issued to American Zinc & Chemicals (AZ&C) has impacted approximately 38 acres owned by LMC and located at and around Outfall 006. Remediation in this area is ongoing and LMC expects to see impacts of this remediation in our future stormwater samples.

LMC's Outfall 006 stormwater discharge location is well within the Limits of Disturbance and Boundary for NPDES Permit PA0255815, which is the industrial stormwater permit issued to Cyprus Amax Minerals Co. that covers the legacy American Zinc & Chemicals remediation site.

The figures below are pictures of LMC's Outfall 006 stormwater location taken March 21, 2023. As can be seen, the discharge location is within the boundary of the AZ&C remediation site, but still on LMC property. All runoff from the remediated AZ&C site is collected and routed through permitted discharge locations identified within the Cyprus Amax Minerals Co. permit, including runoff from LMC's Outfall 006. Also note that the LMC drainage area feeding into Outfall 006 is excavated and covered with remediation material as part of the overall AZ&C remediation project. Historic LMC BMP elements of limestone drainage bedding material in the area have been impacted by the remediation as well. Further, LMC does not have any industrial activities in this area that would require a stormwater discharge permit on behalf of LMC. With these factors considered, LMC requests that LMC's Outfall 006 be eliminated from our permit as all stormwater drainage is effectively handled within the Cyprus Amax Stormwater Permit.

Picture of Outfall 006 Below

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Picture of Outfall 006 below

LMC Property



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Department Response to Comment H

Outfall 006 is located at the southwest side of the facility with a drainage area of 476,523 ft² and is 6% impervious. No industrial activities occur in the drainage area and is identified as “No Exposure” on the renewal application. The drainage area is a grassland area which consist of sheet flow. The drainage area does receive offsite stormwater drainage from the neighboring property, American Zinc and Chemical Company (AZ&C).

Drainage Area of Outfall 006



Outfall 006 has no industrial activities and receives stormwater from AZ&C. Since Outfall 006’s drainage area is not exposed to industrial activities, the monitoring requires of Outfall 006 are not required. Outfall 006 monitoring requirements will be removed, and Outfall 006 will be listed as a stormwater outfall in Part C of the NPDES Permit.

One Change to the Draft Permit was completed pertaining to this comment, monitoring requirements at Outfall 006 are removed.

Department Initiated Change to Draft Permit

During the comment period, the Department noticed that the Draft Permit contained a few typographical errors.

- Typo 1 – Part A.1.A, Outfall 001 Type of Effluent lists IW Process Effluent with ELG and NCCW. Uncontaminated Stormwater is also a constituent of Outfall 001.
- Typo 2 – Part A.1.B, C and D (stormwater Outfalls 002, 003 and 004 respectively) contain an effluent limitation for pH of 6.0 S.U. as in Instantaneous Minimum. Due to the prevalence of acid rain, the instantaneous minimum effluent limitation for pH is not achievable and should instead be “Report”.
- Typo 3 – Part A.I.E imposes flow monitoring for stormwater Outfall 101. Flow monitoring is not normally included as a requirement for stormwater outfalls. The flow parameter was removed to be consistent with stormwater outfall monitoring requirements.

Five (5) changes to the Draft Permit were completed pertaining to the typo corrections. Outfall 001 now includes uncontaminated stormwater as a contributing effluent type, Stormwater Outfalls (002, 003 and 004) instantaneous minimum pH limits have been corrected to “Report” only, and the flow monitoring requirement for stormwater Outfall 101 was removed.

Due to the significant changes proposed in response to the Draft Permit comments, the Department will publish a 2nd Draft of the NPDES Permit in the PA Bulletin.

Attachment A – Revised TMS Model Output



Discharge Information

Instructions Discharge Stream

Facility: Langeloth Metallurgical Plant NPDES Permit No.: PA0004219 Outfall No.: 301

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Process Wastewater , NCCW, Misc wastew.

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
0.024	13300	8.2						

Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank		
			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	59600									
	Chloride (PWS)	mg/L	2020									
	Bromide	mg/L	8.4									
	Sulfate (PWS)	mg/L	36310									
	Fluoride (PWS)	mg/L	124									
Group 2	Total Aluminum	µg/L	1340									
	Total Antimony	µg/L	24									
	Total Arsenic	µg/L	120									
	Total Barium	µg/L	449									
	Total Beryllium	µg/L	< 4.5									
	Total Boron	µg/L	3300									
	Total Cadmium	µg/L	4									
	Total Chromium (III)	µg/L	< 35									
	Hexavalent Chromium	µg/L	< 0.00025									
	Total Cobalt	µg/L	70									
	Total Copper	mg/L	0.05									
	Free Cyanide	µg/L										
	Total Cyanide	µg/L	43									
	Dissolved Iron	µg/L	< 200									
	Total Iron	µg/L	5600									
	Total Lead	µg/L	20									
	Total Manganese	µg/L	1070									
	Total Mercury	µg/L	< 0.2									
	Total Nickel	µg/L	350									
	Total Phenols (Phenolics) (PWS)	µg/L	< 45.5									
	Total Selenium	µg/L	10									
	Total Silver	µg/L	< 0.9									
	Total Thallium	µg/L	< 1000									
Total Zinc	mg/L	< 1.4										
Total Molybdenum	µg/L	28500										
Acrolein	µg/L	< 2.5										
Acrylamide	µg/L	< 110										
Acrylonitrile	µg/L	< 2.5										
Benzene	µg/L	< 0.5										
Bromoform	µg/L	2.5										



Stream / Surface Water Information

Langeloth Metallurgical Plant, NPDES Permit No. PA0004219, Outfall 301

Instructions Discharge **Stream**

Receiving Surface Water Name: Burgett's Fork 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	033846	2.48	1180	11.1			Yes
End of Reach 1	033846	2.37	1178	12			Yes

Q₇₋₁₀

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	2.48	0.1	0.567									100	7		
End of Reach 1	2.37	0.1													

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	2.48														
End of Reach 1	2.37														



Model Results

Langeloth Metallurgical Plant, NPDES Permit No. PA0004219, Outfall 301

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

All

Inputs

Results

Limits

Hydrodynamics

Wasteload Allocations

AFC

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	12,204	
Total Antimony	0	0		0	1,100	1,100	17,899	
Total Arsenic	0	0		0	340	340	5,532	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	341,701	
Total Boron	0	0		0	8,100	8,100	131,799	
Total Cadmium	0	0		0	17.171	20.2	328	Chem Translator of 0.852 applied
Total Chromium (III)	0	0		0	3480.421	11.014	179,214	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	265	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,546	
Total Copper	0	0		0	107.779	112	1,827	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	637.884	1,360	22,129	Chem Translator of 0.469 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.85	26.8	Chem Translator of 0.85 applied
Total Nickel	0	0		0	3036.070	3,042	49,500	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	143.874	169	2,754	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,058	
Total Zinc	0	0		0	761.991	779	12,678	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	48.8	

Acrylamide	0	0		0	N/A	N/A	N/A
Acrylonitrile	0	0		0	650	650	10,576
Benzene	0	0		0	640	640	10,414
Bromoform	0	0		0	1,800	1,800	29,289
Carbon Tetrachloride	0	0		0	2,800	2,800	45,560
Chlorobenzene	0	0		0	1,200	1,200	19,526
Chlorodibromomethane	0	0		0	N/A	N/A	N/A
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	292,887
Chloroform	0	0		0	1,900	1,900	30,916
Dichlorobromomethane	0	0		0	N/A	N/A	N/A
1,2-Dichloroethane	0	0		0	15,000	15,000	244,072
1,1-Dichloroethylene	0	0		0	7,500	7,500	122,036
1,2-Dichloropropane	0	0		0	11,000	11,000	178,986
1,3-Dichloropropylene	0	0		0	310	310	5,044
Ethylbenzene	0	0		0	2,900	2,900	47,187
Methyl Bromide	0	0		0	550	550	8,949
Methyl Chloride	0	0		0	28,000	28,000	455,602
Methylene Chloride	0	0		0	12,000	12,000	195,258
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	16,271
Tetrachloroethylene	0	0		0	700	700	11,390
Toluene	0	0		0	1,700	1,700	27,662
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	110,646
1,1,1-Trichloroethane	0	0		0	3,000	3,000	48,814
1,1,2-Trichloroethane	0	0		0	3,400	3,400	55,323
Trichloroethylene	0	0		0	2,300	2,300	37,424
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	560	560	9,112
2,4-Dichlorophenol	0	0		0	1,700	1,700	27,662
2,4-Dimethylphenol	0	0		0	660	660	10,739
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	1,302
2,4-Dinitrophenol	0	0		0	660	660	10,739
2-Nitrophenol	0	0		0	8,000	8,000	130,172
4-Nitrophenol	0	0		0	2,300	2,300	37,424
p-Chloro-m-Cresol	0	0		0	160	160	2,603
Pentachlorophenol	0	0		0	8.952	8.95	146
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	460	460	7,485
Acenaphthene	0	0		0	83	83.0	1,351
Anthracene	0	0		0	N/A	N/A	N/A
Benzidine	0	0		0	300	300	4,881
Benzo(a)Anthracene	0	0		0	0.5	0.5	8.14
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	488,145
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	73,222
4-Bromophenyl Phenyl Ether	0	0		0	270	270	4,393

Butyl Benzyl Phthalate	0	0		0	140	140	2,278	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	13,343	
1,3-Dichlorobenzene	0	0		0	350	350	5,695	
1,4-Dichlorobenzene	0	0		0	730	730	11,878	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	65,086	
Dimethyl Phthalate	0	0		0	2,500	2,500	40,679	
Di-n-Butyl Phthalate	0	0		0	110	110	1,790	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	26,034	
2,6-Dinitrotoluene	0	0		0	990	990	16,109	
1,2-Diphenylhydrazine	0	0		0	15	15.0	244	
Fluoranthene	0	0		0	200	200	3,254	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	163	
Hexachlorocyclopentadiene	0	0		0	5	5.0	81.4	
Hexachloroethane	0	0		0	60	60.0	976	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	162,715	
Naphthalene	0	0		0	140	140	2,278	
Nitrobenzene	0	0		0	4,000	4,000	65,086	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	276,615	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	4,881	
Phenanthrene	0	0		0	5	5.0	81.4	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	2,115	

CFC CCT (min): PMF: Analysis Hardness (mg/l): Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	3,580	
Total Arsenic	0	0		0	150	150	2,441	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	66,713	
Total Boron	0	0		0	1,600	1,600	26,034	
Total Cadmium	0	0		0	1.136	1.39	22.6	Chem Translator of 0.817 applied
Total Chromium (III)	0	0		0	452.731	526	8,566	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	169	Chem Translator of 0.962 applied

Total Cobalt	0	0		0	19	19.0	309	
Total Copper	0	0		0	59,171	61.6	1,003	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	24,407	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	24,857	53.0	862	Chem Translator of 0.469 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	14.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	337,214	338	5,503	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4,600	4.99	81.2	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	212	
Total Zinc	0	0		0	768,224	779	12,678	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	48.8	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	130	130	2,115	
Benzene	0	0		0	130	130	2,115	
Bromoform	0	0		0	370	370	6,020	
Carbon Tetrachloride	0	0		0	560	560	9,112	
Chlorobenzene	0	0		0	240	240	3,905	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	56,950	
Chloroform	0	0		0	390	390	6,346	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	50,442	
1,1-Dichloroethylene	0	0		0	1,500	1,500	24,407	
1,2-Dichloropropane	0	0		0	2,200	2,200	35,797	
1,3-Dichloropropylene	0	0		0	61	61.0	993	
Ethylbenzene	0	0		0	580	580	9,437	
Methyl Bromide	0	0		0	110	110	1,790	
Methyl Chloride	0	0		0	5,500	5,500	89,493	
Methylene Chloride	0	0		0	2,400	2,400	39,052	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	3,417	
Tetrachloroethylene	0	0		0	140	140	2,278	
Toluene	0	0		0	330	330	5,370	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	22,780	
1,1,1-Trichloroethane	0	0		0	610	610	9,926	
1,1,2-Trichloroethane	0	0		0	680	680	11,065	
Trichloroethylene	0	0		0	450	450	7,322	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	1,790	
2,4-Dichlorophenol	0	0		0	340	340	5,532	
2,4-Dimethylphenol	0	0		0	130	130	2,115	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	260	
2,4-Dinitrophenol	0	0		0	130	130	2,115	

2-Nitrophenol	0	0		0	1,600	1,600	26,034
4-Nitrophenol	0	0		0	470	470	7,648
p-Chloro-m-Cresol	0	0		0	500	500	8,136
Pentachlorophenol	0	0		0	6.868	6.87	112
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	91	91.0	1,481
Acenaphthene	0	0		0	17	17.0	277
Anthracene	0	0		0	N/A	N/A	N/A
Benzidine	0	0		0	59	59.0	980
Benzo(a)Anthracene	0	0		0	0.1	0.1	1.63
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	97,629
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	14,807
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	879
Butyl Benzyl Phthalate	0	0		0	35	35.0	570
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	160	160	2,603
1,3-Dichlorobenzene	0	0		0	69	69.0	1,123
1,4-Dichlorobenzene	0	0		0	150	150	2,441
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	800	800	13,017
Dimethyl Phthalate	0	0		0	500	500	8,136
Di-n-Butyl Phthalate	0	0		0	21	21.0	342
2,4-Dinitrotoluene	0	0		0	320	320	5,207
2,6-Dinitrotoluene	0	0		0	200	200	3,254
1,2-Diphenylhydrazine	0	0		0	3	3.0	48.8
Fluoranthene	0	0		0	40	40.0	651
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	N/A	N/A	N/A
Hexachlorobutadiene	0	0		0	2	2.0	32.5
Hexachlorocyclopentadiene	0	0		0	1	1.0	16.3
Hexachloroethane	0	0		0	12	12.0	195
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A
Isophorone	0	0		0	2,100	2,100	34,170
Naphthalene	0	0		0	43	43.0	700
Nitrobenzene	0	0		0	810	810	13,180
n-Nitrosodimethylamine	0	0		0	3,400	3,400	55,323
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0		0	59	59.0	980
Phenanthrene	0	0		0	1	1.0	16.3

Pyrene	0	0		0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0		0	26	26.0	423

THH CCT (min): PMF: Analysis Hardness (mg/l): Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	91.1	
Total Arsenic	0	0		0	10	10.0	163	
Total Barium	0	0		0	2,400	2,400	39,052	
Total Boron	0	0		0	3,100	3,100	50,442	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	4,881	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	16,271	
Total Mercury	0	0		0	0.050	0.05	0.81	
Total Nickel	0	0		0	610	610	9,926	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	3.91	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	48.8	
Acrylamide	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	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	1,627	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	92.7	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	537	

1,2-Dichloropropane	0	0		0	N/A	N/A	N/A
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A
Ethylbenzene	0	0		0	68	68.0	1,106
Methyl Bromide	0	0		0	100	100.0	1,627
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A
Tetrachloroethylene	0	0		0	N/A	N/A	N/A
Toluene	0	0		0	57	57.0	927
1,2-trans-Dichloroethylene	0	0		0	100	100.0	1,627
1,1,1-Trichloroethane	0	0		0	10,000	10,000	162,715
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A
Trichloroethylene	0	0		0	N/A	N/A	N/A
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	30	30.0	488
2,4-Dichlorophenol	0	0		0	10	10.0	163
2,4-Dimethylphenol	0	0		0	100	100.0	1,627
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	32.5
2,4-Dinitrophenol	0	0		0	10	10.0	163
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	N/A	N/A	N/A
Phenol	0	0		0	4,000	4,000	65,086
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A
Acenaphthene	0	0		0	70	70.0	1,139
Anthracene	0	0		0	300	300	4,881
Benzidine	0	0		0	N/A	N/A	N/A
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	3,254
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	1.63
2-Chloronaphthalene	0	0		0	800	800	13,017
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	1,000	1,000	16,271
1,3-Dichlorobenzene	0	0		0	7	7.0	114
1,4-Dichlorobenzene	0	0		0	300	300	4,881
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	600	600	9,763

Dimethyl Phthalate	0	0		0	2,000	2,000	32,543	
Di-n-Butyl Phthalate	0	0		0	20	20.0	325	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	325	
Fluorene	0	0		0	50	50.0	814	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	65.1	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	553	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	163	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	325	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	1.14	

CRL CCT (min): PMF: Analysis Hardness (mg/l): Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	

Total Nickel	0	0		0	N/A	N/A	N/A
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A
Total Selenium	0	0		0	N/A	N/A	N/A
Total Silver	0	0		0	N/A	N/A	N/A
Total Thallium	0	0		0	N/A	N/A	N/A
Total Zinc	0	0		0	N/A	N/A	N/A
Acrolein	0	0		0	N/A	N/A	N/A
Acrylamide	0	0		0	0.07	0.07	8.6
Acrylonitrile	0	0		0	0.06	0.06	7.37
Benzene	0	0		0	0.58	0.58	71.3
Bromoform	0	0		0	7	7.0	860
Carbon Tetrachloride	0	0		0	0.4	0.4	49.2
Chlorobenzene	0	0		0	N/A	N/A	N/A
Chlorodibromomethane	0	0		0	0.8	0.8	98.3
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	N/A	N/A	N/A
Dichlorobromomethane	0	0		0	0.95	0.95	117
1,2-Dichloroethane	0	0		0	9.9	9.9	1,216
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,2-Dichloropropane	0	0		0	0.9	0.9	111
1,3-Dichloropropylene	0	0		0	0.27	0.27	33.2
Ethylbenzene	0	0		0	N/A	N/A	N/A
Methyl Bromide	0	0		0	N/A	N/A	N/A
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	20	20.0	2,458
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	24.6
Tetrachloroethylene	0	0		0	10	10.0	1,229
Toluene	0	0		0	N/A	N/A	N/A
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A
1,1,2-Trichloroethane	0	0		0	0.55	0.55	67.6
Trichloroethylene	0	0		0	0.6	0.6	73.7
Vinyl Chloride	0	0		0	0.02	0.02	2.46
2-Chlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	0.030	0.03	3.69
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	184
Acenaphthene	0	0		0	N/A	N/A	N/A

Anthracene	0	0		0	N/A	N/A	N/A
Benzidine	0	0		0	0.0001	0.0001	0.012
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.12
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.012
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.12
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	1.23
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	3.69
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	39.3
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A
Chrysene	0	0		0	0.12	0.12	14.7
Dibenzo(a,h)Anthracene	0	0		0	0.0001	0.0001	0.012
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	6.14
Diethyl Phthalate	0	0		0	N/A	N/A	N/A
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A
2,4-Dinitrotoluene	0	0		0	0.05	0.05	6.14
2,6-Dinitrotoluene	0	0		0	0.05	0.05	6.14
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	3.69
Fluoranthene	0	0		0	N/A	N/A	N/A
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.01
Hexachlorobutadiene	0	0		0	0.01	0.01	1.23
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A
Hexachloroethane	0	0		0	0.1	0.1	12.3
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.12
Isophorone	0	0		0	N/A	N/A	N/A
Naphthalene	0	0		0	N/A	N/A	N/A
Nitrobenzene	0	0		0	N/A	N/A	N/A
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.086
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.61
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	405
Phenanthrene	0	0		0	N/A	N/A	N/A
Pyrene	0	0		0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A

Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	Report	Report	Report	Report	Report	µg/L	7,822	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Antimony	Report	Report	Report	Report	Report	µg/L	91.1	THH	Discharge Conc > 10% WQBEL (no RP)
Total Arsenic	0.033	0.051	163	254	407	µg/L	163	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Boron	Report	Report	Report	Report	Report	µg/L	26,034	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Cadmium	Report	Report	Report	Report	Report	µg/L	22.6	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Cobalt	Report	Report	Report	Report	Report	µg/L	309	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	24,407	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Selenium	Report	Report	Report	Report	Report	µg/L	81.2	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Thallium	0.0008	0.001	3.91	6.09	9.76	µg/L	3.91	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	8.13	AFC	Discharge Conc > 10% WQBEL (no RP)
Acrylamide	0.002	0.003	8.6	13.4	21.5	µg/L	8.6	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Bis(2-Ethylhexyl)Phthalate	0.008	0.012	39.3	61.3	98.3	µg/L	39.3	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
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Barium	39,052	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Chromium (III)	8,566	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	169	µg/L	Discharge Conc < TQL
Total Copper	1.0	mg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	4,881	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	862	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	16,271	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.81	µg/L	Discharge Conc < TQL
Total Nickel	5,503	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Silver	1,765	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	31.3	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	7.37	µg/L	Discharge Conc < TQL
Benzene	71.3	µg/L	Discharge Conc < TQL
Bromoform	860	µg/L	Discharge Conc ≤ 25% WQBEL

Carbon Tetrachloride	49.2	µg/L	Discharge Conc < TQL
Chlorobenzene	1,627	µg/L	Discharge Conc < TQL
Chlorodibromomethane	98.3	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	56,950	µg/L	Discharge Conc < TQL
Chloroform	92.7	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	117	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	1,216	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	537	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	111	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	33.2	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	1,106	µg/L	Discharge Conc < TQL
Methyl Bromide	1,627	µg/L	Discharge Conc < TQL
Methyl Chloride	89,493	µg/L	Discharge Conc < TQL
Methylene Chloride	2,458	µg/L	Discharge Conc < TQL
1,1,1,2-Tetrachloroethane	24.6	µg/L	Discharge Conc < TQL
Tetrachloroethylene	1,229	µg/L	Discharge Conc < TQL
Toluene	927	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	1,627	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	9,928	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	67.6	µg/L	Discharge Conc < TQL
Trichloroethylene	73.7	µg/L	Discharge Conc < TQL
Vinyl Chloride	2.46	µg/L	Discharge Conc ≤ 25% WQBEL
2-Chlorophenol	488	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	163	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	1,627	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	32.5	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	163	µg/L	Discharge Conc ≤ 25% WQBEL
2-Nitrophenol	26,034	µg/L	Discharge Conc < TQL
4-Nitrophenol	7,648	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	1,669	µg/L	Discharge Conc < TQL
Pentachlorophenol	3.69	µg/L	Discharge Conc < TQL
Phenol	65,086	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	184	µg/L	Discharge Conc < TQL
Acenaphthene	277	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	4,881	µg/L	Discharge Conc < TQL
Benzidine	0.012	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.12	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.012	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.12	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	1.23	µg/L	Discharge Conc < TQL

Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	3.69	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	3,254	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	879	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	1.63	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	13,017	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	14.7	µg/L	Discharge Conc ≤ 25% WQBEL
Dibenzo(a,h)Anthracene	0.012	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	2,603	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	114	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	2,441	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	6.14	µg/L	Discharge Conc < TQL
Diethyl Phthalate	9,763	µg/L	Discharge Conc ≤ 25% WQBEL
Dimethyl Phthalate	8,136	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	325	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	6.14	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	6.14	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	3.69	µg/L	Discharge Conc < TQL
Fluoranthene	325	µg/L	Discharge Conc < TQL
Fluorene	814	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorobenzene	0.01	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	1.23	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	16.3	µg/L	Discharge Conc < TQL
Hexachloroethane	12.3	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.12	µg/L	Discharge Conc < TQL
Isophorone	553	µg/L	Discharge Conc < TQL
Naphthalene	700	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	163	µg/L	Discharge Conc ≤ 25% WQBEL
n-Nitrosodimethylamine	0.086	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.61	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	405	µg/L	Discharge Conc < TQL
Phenanthrene	16.3	µg/L	Discharge Conc < TQL
Pyrene	325	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	1.14	µg/L	Discharge Conc < TQL