City of Helena, Montana

Pretreatment Program

Detailed Local Limits Re-evaluation

Revisions to the January 2019 Submittal

to become the

Final Local Limits

submitted to EPA July 2021

Prepared by:

CDM Smith
Helena, Montana

Detailed Local Limits Re-evaluation

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Final Local Limits

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This document is intended incorporate all updates to the Local Limits as requested by the EPA between January 2019 and June 17, 2021 into a Final Local Limits submittal document.

All additions to the "January 2019 Detailed Local Limits Re-evaluation" document are shown in red, bold text. Where text, tables, or numeric values from the January 2019 document are being replaced, the text, tables, or numeric values is shown with a ~~strikethrough~~.

The following sections include updates:

- **Section 1**
- **Section 4.1**
- **Section 4.2**
- **Section 4.3.6**
- **Section 5.1**
- **Section 6.1**
- **Section 6.2**
- **Section 6.4.1**
- **Section 6.4.5**
- **Section 6.4.7**
- **Section 6.4.12**
- **Section 6.4.13**
- **Section 7**
- **Section 8.2**
- **Section 8.3**
- **Section 8.4**

Table of Contents

Section 1 Cover Letter

Section 2 Treatment Process Description

- 2.1 Headworks
- 2.2 Primary Clarifiers
- 2.3 Bioreactor Basins
- 2.4 Secondary Clarifiers
- 2.5 Disinfection
- 2.6 Biosolids
- 2.7 Wastewater Treatment Plant Process Schematics

Section 3 Sampling Plan

Section 4 Identification of Pollutants of Concern

- 4.1 Period of Record
- 4.2 Number of Samples Analyzed
- 4.3 Identifying Pollutants of Concern
- 4.4 Pollutants of Concern

Section 5 Significant Industrial Users

- 5.1 Identification of Potential Significant Industrial Users
- 5.2 Description of Current Industrial Users

Section 6 Local Limits Development Summary

- 6.1 USEPA Region 8 Technically-Based Local Limits Development
- 6.2 Regulatory Document References
- 6.3 General Assumptions Used During Data Analysis
- 6.4 Assumptions and Clarifications by Table

Section 7 USAPE Region 8 Local Limits Spreadsheet

Section 8 Proposed Local Limits

- 8.1 Industrial Allocation Approach
- 8.2 Maximum Allowable Headworks Loading (MAHL)
- 8.3 Maximum Allowable Industrial Loading (MAIL)
- 8.4 Proposed Local Limits

Section 1
Cover Letter

CPM Smith

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helenamt.gov

July 8, 2021

Al Garcia
EPA Pretreatment Coordinator
USEPA Region 8
1595 Wynkoop St
Mail Code: 8WP-CWW
Denver, CO 80202-1129

Subject: City of Helena Pretreatment Program 2021 Final Local Limits Submittal

Dear Mr. Garcia:

In 2019, the City of Helena (City) submitted a Detailed Local Limits Re-evaluation to the U.S. Environmental Protection Agency (EPA). The purpose of this document is to provide the Final Local Limits which incorporate changes requested by EPA between January 2019 and June 17, 2021. (June 17, 2021 email from Al Garcia to the City's representative Cathy Laughner "Re: Helena Final Draft Local Limits- 5 attachments").

The format of this document is intended to communicate revisions to the submittal dated January 2019 and to provide the EPA with the Final Local Limits. The document is being submitted by the City with preparation assistance provided by CDM Smith. You will find an index for this document at the beginning of the document.

The City intends to work in cooperation with U.S. EPA to implement the Final Local Limits as soon as possible. Please contact me with any questions.

Sincerely,

Edward L. Coleman
City of Helena Pretreatment Coordinator

cc: Erik Makus, EPA Montana Office Permits Program
Matt Culpo, City of Helena (w/o attachments)
Mark Fitzwater, City of Helena (w/o attachments)
Cathy Laughner, Browning, Kaleczyc, Berry, & Hoven, P.C.
LeAnn Wiegand, CDM Smith

Don Clark
Pretreatment Coordinator
316 N. Park Avenue
Helena, MT 59623
Telephone: 406-447-8431

City of Helena

January 31, 2019

Al Garcia
EPA Pretreatment Coordinator
USEPA Region 8
1595 Wynkoop St
Mail Code: 8WP-CWW
Denver, CO 80202-1129

Subject: City of Helena Pretreatment Program 2019 Local Limits Re-Evaluation

Dear Mr. Garcia:

The City of Helena (City) currently enforces pretreatment ordinances for industrial dischargers to the wastewater collection system which have been in place since 2002. In 2013, the City reviewed the current local limits and transmitted a Technical Memorandum dated 06/28/2013 (Re: City of Helena, Montana WWTP Pretreatment Program Status Update) to the Region 8 EPA which evaluated the appropriateness of the current local limits, provided a narrative of upcoming POTW process changes which would affect POTW influent and effluent characteristics, and proposed a data collection schedule to provide adequate data to complete a technically-based local limits detailed reevaluation. On April 21, 2016, the City submitted a technically-based local re-evaluation to Ms. Kusnierz with the US EPA Montana Office. Ms. Kusnierz evaluated local limits re-evaluation and noted that the MPDES permit limits for zinc and copper effluent limits (effective September 1, 2017) needed to be incorporated into the calculations. Due to expiration of the MPDES discharge permit, the resubmittal of detailed local limits re-evaluation was postponed.

The following local limits re-evaluation document is being submitted by the City with preparation assistance provided by CDM Smith. This submittal contains a description of the existing wastewater treatment plant (WWTP), analysis of pollutants of concern, background information on the current significant industrial user and categorical industrial user, sampling data, and the USEPA Region 8 Local Limits Spreadsheet used to complete the detailed local limits re-evaluation. You will find an index for this document at the beginning of the document.

The purpose of this document is to submit a detailed re-evaluation of local limits for review and acceptance by the U.S. EPA as addressed under Pretreatment Audit Finding Corrective Action 4

from the Pretreatment Audit Report dated September 11-13, 2017. The City looks forward to hearing back from you regarding your evaluation and/or approval of the provide local limits re-evaluation document.

Sincerely,

Don Clark
City of Helena Pretreatment Coordinator

cc: David Rise, EPA Montana Office Permits Program
Matt Culpo, City of Helena
Mark Fitzwater, City of Helena (w/o attachment)
LeAnn Wiegand, CDM Smith (w/o attachment)
Travis Meyer, CDM Smith (w/o attachment)

Section 2
Treatment Process Description

The City of Helena Wastewater Treatment Plant is an activated sludge biological nutrient removal treatment plant with two-stage anaerobic sludge digestion. The following is a description of the treatment components.

2.1 Headworks

The headworks of the WWTP consists of mechanically cleaned bar screens and aerated grit chambers. Screenings are processed through washer/compactors with final screening disposal at the Lewis & Clark Landfill. Grit is processed through washer/classifiers with final grit disposal at the landfill. Influent sampling occurs upstream of the headworks. Influent flow measurement utilizes a Parshall Flume equipped with an ultrasonic level sensor to provide for a continuous record of flow.

2.2 Primary Clarifiers

Primary clarification is completed by three primary clarifiers. The effluent from the primary clarifiers is directed to a pump station which pumps to the bioreactors. Scum is collected in the primary scum pump station and sludge is collected in the clarifier. Both scum and sludge are pumped via respective pumping systems to the secondary digesters.

2.3 Bioreactor Basins

The bioreactor basins consist of three trains. The bioreactor effluent is directed to a splitter structure that directs flow to secondary clarifiers.

2.4 Secondary Clarifiers

Secondary clarification is completed by three clarifiers. Effluent from the clarifiers is sent to ultraviolet disinfection. Sludge from the clarifiers is split between return activated sludge directed to the bioreactors and waste activated sludge directed to a belt filter press. Scum from the clarifiers is sent to the belt filter press.

2.5 Disinfection

Ultraviolet light is utilized for disinfection. Effluent flows from disinfection to a Cipolletti weir for flow measurement and then is discharged to a City of Helena effluent ditch which discharges into Prickly Pear Creek. Effluent sampling occurs between the UV system and the flume.

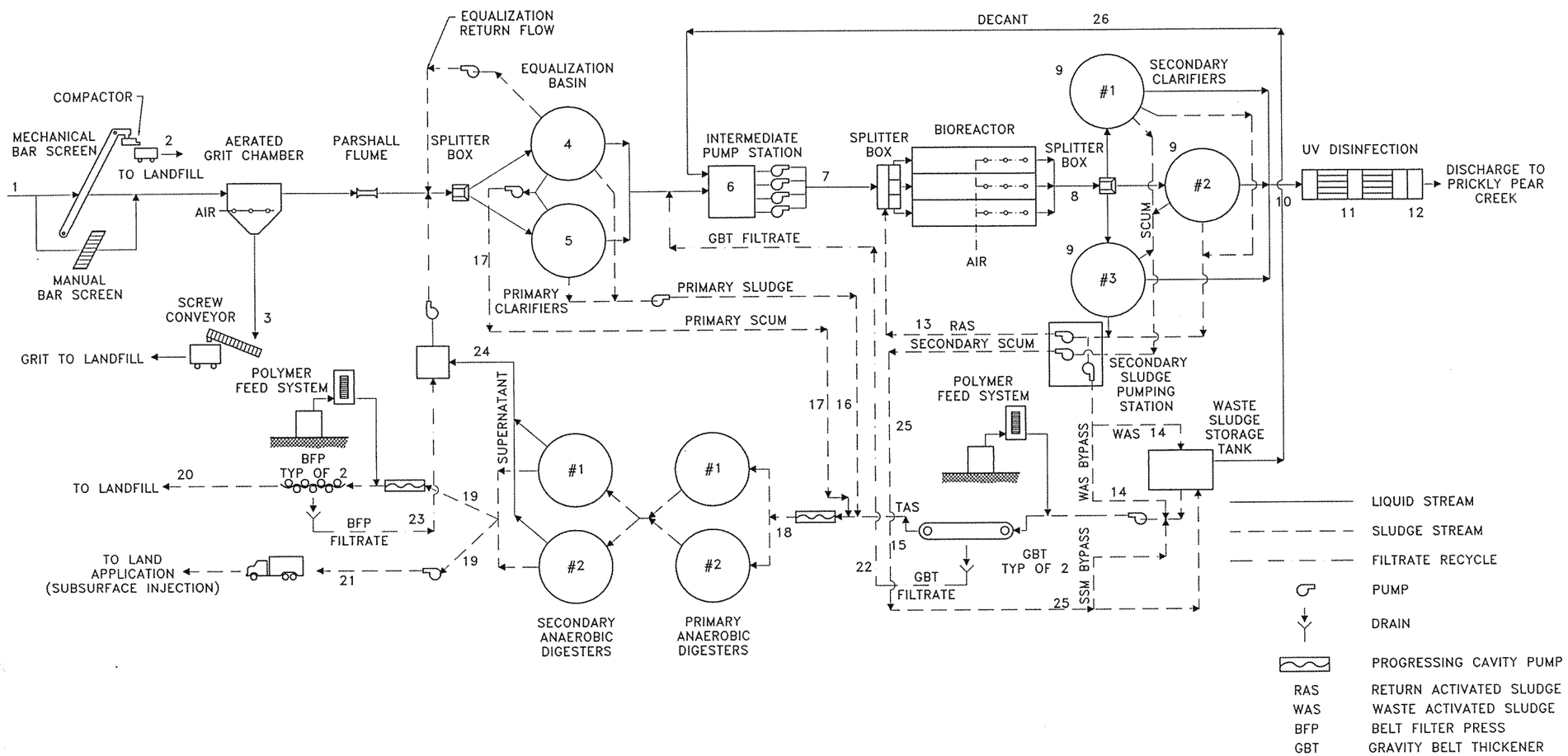
2.6 Biosolids

The sludge at the facility is treated utilizing anaerobic digestion. Primary sludge and primary scum are sent to the digester feed. Secondary sludge and secondary scum are processed through the belt

filter press. Supernatant is returned to the splitter box of the primary clarifiers. Cake is loaded into trucks and hauled for land application on various land application sites throughout the Helena Valley.

2.7 Water Reclamation Facility Process Schematics

Following this section is a WWTP process schematic.



1	2	3	4	5	6	7	8	9	10	11	12	13
RAW INFLUENT	SCREENING	GRIT TO LANDFILL	EQUALIZATION BASIN	PRIMARY CLARIFIER	PUMP STATION	PRIMARY EFFLUENT	BIOREACTOR EFFLUENT	SECONDARY CLARIFIERS	SETTLED EFFLUENT	UV DISINFECTION	EFFLUENT FLOW MEASUREMENT	RETURN SLUDGE

14	15	16	17	18	19	20	21	22	23	24	25	26
WASTE SLUDGE	THICKENED ACTIVATED SLUGE AND SCUM	PRIMARY SLUDGE	PRIMARY SCUM	DIGESTER FEED	DIGESTED SLUDGE	DEWATERED SLUDGE	LIQUID SLUDGE	GBT FILTRATE	BFP FILTRATE	DIGESTER SUPERNATANT	SECONDARY SCUM	SLUDGE STORAGE TANK – DECANT

VERIFY SCALE
THESE PRINTS MAY BE REDUCED FROM THE LINE BELOW
MAKE SURE ITS ON ORIGINAL DRAWING
VOID IF SCALE ACCORDINGLY

MONTANA ROBERT J. MORRISON 5391 PE REGISTERED PROFESSIONAL ENGINEER

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APPR. BY: RJM
DATE: 9/98
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DATE: 8/98

HELENA WASTEWATER TREATMENT PLANT
UPGRADE AND IMPROVEMENTS
HELENA, MONTANA

PROCESS FLOW DIAGRAM

PROJECT NO.
0500.133-040-0111
SHEET NUMBER
7
DRAWING NUMBER
1-G-7

Section 3
Sampling Plan

The City of Helena Pretreatment Coordinator and all City WWTP operators who collect samples are trained in proper sample collection including quality assurance and quality control in accordance with 40 CFR Part 136.

WWTP influent samples are collected from a composite sampler set in the plant influent structure which runs from 4:40 am to 4:40 pm daily. WWTP effluent samples are collected from a composite sampler set in the plant effluent structure which runs from 4:30 am to 4:30 pm. Sampling by the WWTP operators of significant industrial users (SIUs), categorical industrial users (CIUs), domestic, residential, and the receiving stream (Prickly Pear Creek) are collected using a 24 hour composite sampler. Biosolids samples are collected in accordance with 40 CFR Part 503.8. Trucked/hauled waste samples are collected from each truck and samples are analyzed as the discretion of WWTP operators.

The proposed data collection schedule to obtain necessary data completion the local limits detailed re-evaluation was submitted to the United State Environmental Protection Agency (EPA) Region 8 Pretreatment Coordinator in a Technical Memorandum on June 28, 2013 as follows.

Table 3-1 Proposed Data Collection Schedule

Location	Frequency	Parameter	Sample Type
WWTP Influent	Week Day	BOD_5, TSS Flow	Composite Continuous
	Weekly	Nutrients[1]	Composite
	Quarterly (Monthly for 2015)	Table III[2] Hardness as $CaCO_3$	Composite
	Annually	Table II	Composite
WWTP Effluent	Week Day	BOD_5, TSS Flow	Composite Continuous
	Weekly	Nutrients[1]	Composite
	Quarterly (Monthly for 2015)	Table III[2] Hardness as $CaCO_3$	Composite
	Annually	Table II	Composite
Prickly Pear Creek (Receiving Stream)	Quarterly	Table III[2] Nutrients[1] Hardness as $CaCO_3$	Grab
	Annually	Table II	Composite
Hauled Waste	Monthly	Table III[2] Flow	Composite
Permitted SIU	In accordance with current permits		
Residential	Monthly	Table III	Composite
Commercial	Monthly	Table III	Composite

[1]Nutrients include total ammonia, total nitrogen, and total phosphorus
[2]Table III includes metals antimony, dissolved aluminum, arsenic, beryllium, cadmium, chromium (total, III, and VI) copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, and zinc.

Don Clark
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City of Helena

January 31, 2019

Al Garcia
EPA Pretreatment Coordinator
USEPA Region 8
1595 Wynkoop St
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Denver, CO 80202-1129

Subject: Chain of Custody
City of Helena Wastewater Treatment Plant

Dear Mr. Garcia:

The City of Helena Wastewater Treatment Facility has a documented chain of custody process that is used for all pretreatment sampling and plant process sampling. Records of sampling including chain of custody forms, are maintained on file in hard copy and electronic format. The laboratory utilized to test samples (Alpine Analytical, Inc.) also has chain of custody procedures to ensure sample integrity. To the best of my knowledge, all data provided in this submission is consistent with proper chain of custody procedures.

Sincerely,

Don Clark
Pretreatment Coordinator

Section 4
Identification of Pollutants of Concern

4.1 Period of Record

The US EPA Region 8 Technically-Based Local Limits Development Strategy was used as a guide to compile information necessary to developed technically-based local limits. For the purposes of this Pretreatment Detailed Re-evaluation **and final Local Limits**, the period of record was October 2014 through October 2018. **Additional domestic and commercial sector samples were collected on November 4, 2020 and January 13, 2021 to supplement the 2016 uncontrollable sector dataset. The 2020 and 2021 samples are included in the data set. (See Section 6.4.5 for discussion about the uncontrollable sector samples being representative of the current service area).**

4.1.1 Period of Record Determination

The POTW began operation in 1976 and underwent significant upgrades in 2000 which included activated sludge, biological nutrient removal capabilities, and ultraviolet disinfection.

The period of record began in October 2014 because system wide POTW changes were made between 2011 and 2014 to address facility optimizations for increased removal of total nitrogen, total phosphorous, copper, and zinc. In preparation for the April 21, 2016 detailed local limits re-evaluation, the period of record was October 2014 to December 2015. As noted in the cover letter in Section 1, after incorporating the final MPDES permit limits for zinc and copper (effective September 1, 2017) additional detail investigation was needed to determine if the POTW had capacity to accept copper and zinc from industrial users. Sampling continued for WWTP influent, effluent, and prickly pear creek hardness through October 2018. The period of record includes 2014 through 2018 because extensive sampling of the trucked/hauled waste and prickly pear creek was completed during the initial period of record (October 2014- December 2015). Since the characteristics of trucked/hauled waste and Prickly Pear Creek have not changed significantly since that time, this data is included in the period of record.

In 2012, the City of Helena conducted a watershed study to identify sources of copper and zinc. In the fall of 2012, the City submitted a Watershed Control Plan to Montana Department of Environmental Quality (MDEQ) which identified zinc in the drinking water plants' influent and effluent and did not identify significant copper in either drinking water plants' influent or effluent. The Watershed Control Plan proposed upgrades to improve efficiency of zinc and copper removal. The Tenmile WTP began to add sodium hydroxide to raise water pH to 8.5 at the front of the WTP to precipitate zinc enhancing zinc removal through the filtration process.

In accordance with the MDPES permit, the City conducted a WWTP facility optimization study for total nitrogen and total phosphorus in 2013. WWTP staff worked with Grant Weaver of The Water Planet Company to test numerous process modifications. The WWTP staff collected samples at identified locations for different parameters after making minor process modifications. Process optimization strategies were implemented at the WWTP beginning in the fall of 2013.

4.2 Number of Samples Analyzed

Available data for WWTP influent, WWTP effluent, WWTP sludge, Prickly Pear stream, trucked and hauled waste, domestic wastewater, commercial wastewater, and industrial wastewater was compiled and analyzed. All samples were collected and analyzed in accordance with the methods and procedures approved in 40 CFR Section 136. Table 4-1 summarizes the number of samples collected for each process stream. In addition to the parameters listed below, annual Whole Effluent Toxicity testing and 40 CFR Part 122, Appendix D, Table II testing is conducted. All lab data is available upon request.

Table 4-1 Summary of Data Included in Local Limits Detailed Re-evaluation

Process Stream	Parameter	Number of Samples	Frequency
WWTP Influent	Flow, BOD, TSS	451	Week Days
	Nutrients	208	Weekly[1]
	Metals	27	Monthly[1] Quarterly[2]
	Cyanide Phenols	18	Monthly[1] Annually[2]
WWTP Effluent	Flow, BOD, TSS	451	Week Days
	Nutrients	208	Weekly[1]
	Metals	49	Monthly
	Cyanide Phenols	18	Monthly[1] Annually[2]
WWTP Biosolids	Nutrients	6	Quarterly[1]
	Metals		
Prickly Pear Stream	Hardness	11	Quarterly
	Nutrients Metals	5	Quarterly[1]
Trucked/Hauled Waste	Nutrients	15	Monthly[1]
	Metals		
	Cyanide		
	Phenols		
Uncontrollable Sector (Domestic and Commercial)	Metals	10 ~~6~~	Periodic
	Cyanide		
	Phenols		
Industrial Wastewater	Metals	17	Quarterly
	Cyanide		

[1]Samples from October 2014-December 2015
[2]Samples from January 2016-October 2018

The City complied all data noted in Table 4-1 in a spreadsheet titled "Data Analysis". The "Data Analysis" spreadsheet is included at the end of this Section. On March 16, 2021, the "Data Analysis" spreadsheet was updated to include the uncontrollable sector sampling events on November 4, 2020 and January 13, 2021. These updates are shown in green in the "Data Analysis" spreadsheet.

In the April 15, 2019 email, EPA noted that a commercial sampling event did not include the date in the "Data Analysis" spreadsheet. The City has consulted the analytical laboratory copy to confirm the date of the sampling event and included the date in the "Data Analysis" spreadsheet.

CDM Smith

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In the June 17, 2021 email, EPA noted a data discrepancy for Arsenic (AS) uncontrollable domestic loading between the "Data Analysis" spreadsheet and the Region 8 LL Spreadsheet (Table 5, Column E). This data discrepancy has been corrected, see Section 6.4.5.

4.3 Identifying Pollutants of Concern

In accordance with Step 1 of the USEPA Region 8 Technically-Based Local Limits Development Strategy, WWTP influent samples were analyzed to determine pollutants of concern. The following categories were analyzed:

4.3.1 Arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, zinc

Resulting Pollutants of Concern: Arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, zinc

4.3.2 Any pollutant listed in your State Water Quality Standards for your receiving water or listed in the NPDES permit.

Explanation: The MPDES permit includes effluent limits for multiple parameters. The MPDES permit also requires sampling of dissolved oxygen and whole effluent toxicity testing for the receiving water (Prickly Pear Creek). Dissolved oxygen is not considered a pollutant of concern. Pollutants evaluated by whole effluent toxicity testing are addressed through other pollutant evaluations. Extensive analysis was performed for the following pollutants.

- Biochemical Oxygen Demand (BOD_5)
- Total Suspended Solids (TSS)
- E. coli Bacteria
- Oil & Grease
- Total Ammonia as N
- Total Nitrogen
- Total Phosphorus
- Copper
- Zinc

An extensive analysis of these pollutants concluded that none of these are pollutants of concern for the City of Helena. For each pollutant evaluated, the concentration of the pollutant in the effluent was less than the MPDES effluent discharge limit. The only parameters where the effluent value approaches the permit limit are for copper and zinc which have previously been identified as pollutants of concern in Section 4.3.1 above. A summary of WWTP design capacity, influent values, MPDES Permit limits, and effluent values is included in Table 4-2. The data used to make this determination can be found in the WWTP Monthly Discharge Monitoring Reports and the "Data Analysis" spreadsheet. The "Data Analysis" spreadsheet is included at the end of this section.

Resulting Pollutants of Concern: copper, silver (previously identified in Section 4.3.1)

Table 4-2 Summary of WWTP Design Capacity, Influent, MPDES Permit Limits, and Effluent

Parameter	Period	Unit	WWTP Design Capacity	Influent	MPDES Permit Limit	Effluent	Effluent as % of MPDES Permit Limit
BOD_5	Monthly	lb/day	9,300	7,719	1,351	89	7
TSS	Monthly	lb/day	11,900	6,840	1,351	94	7
Oil & Grease	Max Daily	mg/L	NA[1]	4	<10	<1	10
Total Ammonia as N	Monthly	mg/L	NA[1]	27[3]	1.67	0.25	15
Total Nitrogen eff. 1/1/14	Monthly	lb/day	NA[1]	NA[2]	227-231	133	58
Total Nitrogen eff. 1/1/15	Monthly	lb/day	NA[1]	NA[2]	227-235	132	56
Total Nitrogen eff. 1/1/16	Monthly	lb/day	NA[1]	882	227-239	122	51
Total Nitrogen eff. 1/1/17	Monthly	lb/day	NA[1]	1,301	227-243	128	53
Total Phosphorus	Monthly	lb/day	NA[1]	118[4]	108	47	44
Copper, Total Recoverable	Monthly	mg/L	NA[1]	0.088	0.009	0.009	100
Zinc, Total Recoverable	Monthly	mg/L	NA[1]	0.158	0.11	0.081	74

[1] The design for the last major Helena WWTP improvement project construction in 2003 did not include design criteria for this parameter.
[2] This influent parameter is not sampled by the Helena WWTP
[3] Influent Total Ammonia as N was only monitored between January 2016 to present on a quarterly basis.
[4] Influent Total Phosphorus was only monitored between January 2016 to present on a quarterly basis.

4.3.3 Any pollutant specified in 40 CFR 122 Appendix D, Tables II or V that was detected in an influent or effluent sample and its concentration was equal to or greater than 0.05 mg/L.

Explanation: WWTP effluent was sampled annually for 40 CRF 122 Appendix D, Table II. None of the samples resulted in concentrations equal to or greater than 0.05 mg/L.

40 CRF 122 Appendix D Table V was not tested between October 2014 or October 2018. Part I, E, c. of the MPDES

Permit states:

> If, based upon information amiable to the Permittee, there is reason to suspect the presence of any toxic or hazardous pollutant listed in Table V, or any other pollutant in an quantity or concentration known or suspected to adversely affect the POTW operation, receiving water quality, or solids disposal procedures, analysis for those pollutants shall be performed at least four time per year both the influent and the effluent.

During the period of record, there has been no reason to suspect the presence of any toxic or hazardous pollutants listed in Table V. Therefore, Table V was not tested.

Resulting Pollutants of Concern: None

4.3.4 Any pollutant that is present at 0.01 mg/L or greater (above the method detection limit if MDL is >0.01 mg/L) AND has a BCF (bioconcentration factor) of 300 or greater according to Appendix B of the USEPA Region 8 Technically-Based Local Limit Development Strategy

Explanation: Review of the Table II and Table III pollutant scans revealed that no pollutants are present at 0.01 mg/L or greater AND have a bioconcentration factor of greater than 300.

Resulting Pollutants of Concern: None

4.3.5 Any pollutant that is determined to be present at or equal to or greater than 0.1 mg/L in the influent or effluent samples and that may be toxic to the POTW, receiving waters, worker health, or biosolids if discharged

Explanation: Review of the Table II and Table III pollutant revealed no pollutants with equal to or greater than 0.1 mg/L that could be toxic to POTW, receiving waters, worker health, or biosolids if discharged. There have been instances where zinc in WWTP effluent has been over 0.1 mg/L, but zinc has previously been identified as a pollutant of concern.

Resulting Pollutants of Concern: Zinc

4.3.6 Any pollutant that has a current average influent loading greater than 70% of the POTW design load

Explanation: Currently, the only parameters for which the POTW design load can be assessed are BOD_5 and TSS because the WWTP's most recent major construction improvement in 2003 was not designed for nutrient removal or metals removal.

The influent values exceed 70% of the design flow for average monthly BOD_5 concentration (mg/L) and loading (lb/day) and average monthly TSS concentration (mg/L). However, BOD_5 and TSS are not being added as pollutants of concern at this time for two reasons.

1. As shown in Table 4-2, the effluent values for these parameters do not exceed 7 percent of the MPDES permit limits.
2. Neither the permitted CIU (Decorative Industrial Plating, LLC) nor the permitted SIU (Montana Rail Link) contribute BOD_5 and TSS.

The City stated in the October 19, 2020 email to EPA, "The City has evaluated their IU inventory and determined that all Industrial Users have been identified and are currently permitted. (Past and present IU inventory evaluations have not resulted in any new IUs being permitted.) Both permitted IUs have been evaluated and do not contributed significant BOD or TSS. Therefore, BOD and TSS loadings are contributed by the uncontrollable domestic and commercial sectors. The City of Helena reiterates that the WWTP's removal efficiency for BOD and TSS consistently results in effluent significantly below the WWTP's effluent limits for both BOD and TSS."

Resulting Pollutants of Concern: None

4.3.7 Any pollutant that is identified through WET characterization studies as being present and suspected or responsible for toxicity

Explanation: Review of the WET studies revealed no pollutants as being present and suspected or responsible for toxicity.

Resulting Pollutants of Concern: None

4.3.8 Any pollutant that is identified in biosolids analytical results which is not a pollutant that would be expected or is at a concentration that would be considered atypical

Explanation: Review of the biosolids sampling revealed no pollutants that would not be expected or that was at a concentration that would be considered atypical.

Resulting Pollutants of Concern: None

4.3.9 Any pollutant that is specifically designated by the POTW Pretreatment Program and/or Approval Authority as a pollutant of concern.

Explanation: The POTW Pretreatment Program has not identified any additional pollutants of concern.

Resulting Pollutants of Concern: None

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4.4 Pollutants of Concerns

After evaluating the categories above, the following pollutants were identified as pollutants of concern.

Arsenic	Lead	Selenium
Cadmium	Mercury	Silver
Chromium	Molybdenum	Zinc
Copper	Nickel	

All monthly discharge monitoring reports, laboratory pollutant scans, and plant records are available upon request. The "Data Analysis" spreadsheet used to review data is included at the end of this section.

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Pollutant of Concern Determination

Parameter	Period	Unit	WWTP Design Capacity	Influent	MPDES Permit Limit	Effluent	Effluent as % of limit
BOD5	Ave Monthly	mg/L	206	261	30	3.71	12
		lb/day	9,300	7719	1,351	89	7
	Ave Weekly	mg/L	NA[1]	277	45	6.72	15
		lb/day	NA[1]	7741	2,027	188	9
TSS	Ave Monthly	mg/L	265	248	30	4.26	14
		lb/day	11,900	6,840	1,351	94	7
	Ave Weekly	mg/L	NA[1]	270	45	5.43	12
		lb/day	NA[1]	7,528	1,260	152	12
Oil & Grease	Max Daily	mg/L	NA[1]	4	<10	<1	10
Total Ammonia, as N	Ave Monthly	mg/L	NA[1]		1.67	0.250	15
	Ave Weekly	mg/L	NA[1]	NA[2]	3.83	0.490	13
Total Nitrogen (TKN + N+N) (eff. Jan 1, 2014)	Ave Monthly	lb/day	NA[1]	NA[2]	227-231	133	58
	Max Daily	lb/day	NA[1]	NA[2]	294-298	159	53
Total Nitrogen (TKN + N+N) (eff. Jan 1, 2015)	Ave Monthly	lb/day	NA[1]	NA[2]	227-235	132	56
	Max Daily	lb/day	NA[1]	NA[2]	294-302	161	53
Total Nitrogen (TKN + N+N) (eff. Jan 1, 2016)	Ave Monthly	lb/day	NA[1]	882	227-239	122	51
	Max Daily	lb/day	NA[1]	NA[3]	294-310	NA[3]	NA[3]
Total Nitrogen (TKN + N+N) (eff. Jan 1, 2017)	Monthly	lb/day	NA[1]	1,301	227-243	128	53
Total Phosphorus	Monthly	mg/L	NA[1]	118	108	47	44
	Ave Weekly	lb/day	NA[1]	NA[2]	166	65	39
Copper, Total Recoverable	Ave Monthly	mg/L	NA[1]	0.088	0.009	0.009	100
	Max Daily	mg/L	NA[1]	NA[2]	0.013	0.012	92
Zinc, Total Recoverable	Ave Monthly	mg/L	NA[1]	0.158	0.11	0.081	74
	Max Daily	mg/L	NA[1]	NA[2]	0.11	0.077	70

Footnotes
[1] = The design for the last major Helena WWTP improvement project construction in 2003 did not include design criteria for this parameter.
[2] = This influent parameter is not sampled by the Helena WWTP
[3] = This parameter became effective in January 1, 2016. Adequate data is not available to analyze this parameter at this time.

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
10/1/2014	3.42
10/2/2014	3.51
10/3/2014	3.87
10/4/2014	3.32
10/5/2014	3.32
10/6/2014	3.34
10/7/2014	3.43
10/8/2014	3.48
10/9/2014	3.46
10/10/2014	3.35
10/11/2014	3.26
10/12/2014	3.44
10/13/2014	3.41
10/14/2014	3.49
10/15/2014	3.53
10/16/2014	3.37
10/17/2014	3.53
10/18/2014	3.33
10/19/2014	3.46
10/20/2014	3.54
10/21/2014	3.59
10/22/2014	3.75
10/23/2014	3.45
10/24/2014	3.58
10/25/2014	3.56
10/26/2014	3.49
10/27/2014	3.64
10/28/2014	3.66
10/29/2014	3.56
10/30/2014	3.59
10/31/2014	3.66
11/1/2014	3.6
11/2/2014	3.75
11/3/2014	3.72
11/4/2014	3.65
11/5/2014	3.51
11/6/2014	3.68
11/7/2014	3.57
11/8/2014	3.55
11/9/2014	3.7
11/10/2014	3.55
11/11/2014	3.53
11/12/2014	3.58
11/13/2014	3.58
11/14/2014	3.6
11/15/2014	3.39
11/16/2014	3.46
11/17/2014	3.38
11/18/2014	3.48
11/19/2014	3.44

Highest Monthly Average Flow

	2014	2015	2016	2017	2018
January		3.9106452	2.963870968	3.241935	3.054516
February		3.7442857	3.016206897	3.414286	3.265357
March		3.3935484	3.010645161	3.319355	3.686774
April		3.3873333	3.135	3.269667	3.821613
May		3.3541935	3.158064516	3.104839	3.831613
June		3.2203333	3.060666667	3.112	4.384
July		3.3735484	2.82483871	3.000645	3.715161
August		3.3625806	2.933548387	3.072581	3.532581
September		3.507	3.041333333	3.257333	3.597667
October	3.4964516	3.3045161	3.319354839	3.015161	3.59129
November	3.4926667	3.145	3.221666667	3.155333	NA
December	3.4767742	NA	3.121612903	3.191935	NA

From DMR

	Influent		Effluent	
	Ave Monthl	Max Day	Ave Monthly	Max Day
Oct-14	3.5	3.87		
Nov-14	3.49	3.93		
Dec-14	3.48	4.01		
Jan-15	3.91	4.62		
Feb-15	3.74	3.94		
Mar-15	3.39	3.8		
Apr-15	3.39	3.65		
May-15	3.35	4.15		
Jun-15	3.22	3.56		
Jul-15	3.37	4.04	2.71	3.32
Aug-15	3.36	3.81	2.7	3.14
Sep-15	3.51	3.89	2.87	3.31
Oct-15	3.31	3.58	2.75	2.9
Nov-15	3.15	3.67	2.62	3.04
Dec-15	2.94	3.17	2.48	2.82
Jan-16	2.96	3.3	2.65	3.34
Feb-16	3.02	3.18	2.58	2.74
Mar-16	3.01	3.22	2.48	2.58
Apr-16	3.13	3.48	2.51	2.75
May-16	3.16	3.57	2.53	2.75
Jun-16	3.06	3.41	2.48	3.21
Jul-16	2.82	3.23	2.26	2.72
Aug-16	2.93	3.54	2.13	2.55
Sep-16	3.04	3.33	2.36	2.8
Oct-16	3.32	3.61	2.75	3.04
Nov-16	3.22	3.43	2.69	2.83
Dec-16	3.12	3.43	2.57	2.79
Jan-17	3.24	3.44	2.62	2.89
Feb-17	3.41	3.84	2.79	3.6
Mar-17	3.32	3.62	3.07	3.31
Apr-17	3.27	3.6	2.96	3.29
May-17	3.1	4.15	2.76	3.7

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
11/20/2014	3.36
11/21/2014	3.29
11/22/2014	3.2
11/23/2014	3.31
11/24/2014	3.33
11/25/2014	3.33
11/26/2014	3.29
11/27/2014	3.23
11/28/2014	3.22
11/29/2014	3.57
11/30/2014	3.93
12/1/2014	3.81
12/2/2014	3.58
12/3/2014	3.48
12/4/2014	3.56
12/5/2014	3.38
12/6/2014	3.4
12/7/2014	3.39
12/8/2014	3.49
12/9/2014	3.49
12/10/2014	3.41
12/11/2014	3.49
12/12/2014	3.33
12/13/2014	3.43
12/14/2014	3.42
12/15/2014	3.5
12/16/2014	3.51
12/17/2014	3.37
12/18/2014	3.49
12/19/2014	3.35
12/20/2014	3.31
12/21/2014	3.58
12/22/2014	3.42
12/23/2014	3.47
12/24/2014	3.31
12/25/2014	3.08
12/26/2014	3.36
12/27/2014	3.25
12/28/2014	3.41
12/29/2014	3.79
12/30/2014	4.01
12/31/2014	3.91
1/1/2015	3.61
1/2/2015	3.83
1/3/2015	3.76
1/4/2015	3.96
1/5/2015	3.9
1/6/2015	3.9
1/7/2015	3.91
1/8/2015	3.97

Jun-17	3.11	3.5	2.72	3.1
Jul-17	3	3.29	2.57	2.98
Aug-17	3.07	3.6	2.59	3.04
Sep-17	3.26	4.11	2.72	3.52
Oct-17	3.01	3.55	2.71	2.91
Nov-17	3.16	3.37	2.76	2.92
Dec-17	3.19	3.53	2.68	2.9
Jan-18	3.05	3.39	2.67	3.12
Feb-18	3.27	4.19	2.75	3.77
Mar-18	3.69	4.85	3.34	4.6
Apr-18	3.83	4.28	3.46	3.79
May-18	3.83	4.93	3.52	4.27
Jun-18	4.39	5.93	3.76	5.03
Jul-18	3.72	4.28	3.25	4.05
Aug-18	3.53	3.86	3.01	3.29
Sep-18	3.6	4.2	3.04	3.54

Influent Max Month	**Effluent Max Month**
4.39 MGD	3.76 MGD

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
1/9/2015	4.01
1/10/2015	3.8
1/11/2015	3.79
1/12/2015	3.87
1/13/2015	3.85
1/14/2015	3.84
1/15/2015	4.34
1/16/2015	3.59
1/17/2015	3.58
1/18/2015	3.59
1/19/2015	3.88
1/20/2015	3.69
1/21/2015	3.71
1/22/2015	3.87
1/23/2015	3.96
1/24/2015	4.62
1/25/2015	4.3
1/26/2015	4.19
1/27/2015	3.96
1/28/2015	4.02
1/29/2015	4.02
1/30/2015	4.07
1/31/2015	3.84
2/1/2015	3.89
2/2/2015	3.79
2/3/2015	3.86
2/4/2015	3.94
2/5/2015	3.85
2/6/2015	3.75
2/7/2015	3.71
2/8/2015	3.87
2/9/2015	3.88
2/10/2015	3.82
2/11/2015	3.84
2/12/2015	3.83
2/13/2015	3.75
2/14/2015	3.64
2/15/2015	3.66
2/16/2015	3.92
2/17/2015	3.62
2/18/2015	3.71
2/19/2015	3.55
2/20/2015	3.53
2/21/2015	3.58
2/22/2015	3.75
2/23/2015	3.72
2/24/2015	3.67
2/25/2015	3.62
2/26/2015	3.79
2/27/2015	3.7

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
2/28/2015	3.6
3/1/2015	3.67
3/2/2015	3.66
3/3/2015	3.8
3/4/2015	3.65
3/5/2015	3.59
3/6/2015	3.42
3/7/2015	3.24
3/8/2015	3.38
3/9/2015	3.31
3/10/2015	3.29
3/11/2015	3.38
3/12/2015	3.33
3/13/2015	3.33
3/14/2015	3.16
3/15/2015	3.29
3/16/2015	3.4
3/17/2015	3.49
3/18/2015	3.51
3/19/2015	3.39
3/20/2015	3.21
3/21/2015	3.15
3/22/2015	3.27
3/23/2015	3.35
3/24/2015	3.54
3/25/2015	3.54
3/26/2015	3.37
3/27/2015	3.31
3/28/2015	3.27
3/29/2015	3.25
3/30/2015	3.29
3/31/2015	3.36
4/1/2015	3.36
4/2/2015	3.44
4/3/2015	3.54
4/4/2015	3.65
4/5/2015	3.36
4/6/2015	3.64
4/7/2015	3.57
4/8/2015	3.51
4/9/2015	3.49
4/10/2015	3.43
4/11/2015	3.3
4/12/2015	3.46
4/13/2015	3.31
4/14/2015	2.89
4/15/2015	3.47
4/16/2015	3.56
4/17/2015	3.27
4/18/2015	3.21

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City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
4/19/2015	3.34
4/20/2015	3.33
4/21/2015	3.32
4/22/2015	3.36
4/23/2015	3.34
4/24/2015	3.32
4/25/2015	3.31
4/26/2015	3.57
4/27/2015	3.44
4/28/2015	3.28
4/29/2015	3.21
4/30/2015	3.34
5/1/2015	3.14
5/2/2015	3.06
5/3/2015	3.14
5/4/2015	3.2
5/5/2015	3.34
5/6/2015	3.31
5/7/2015	3.41
5/8/2015	3.26
5/9/2015	3.16
5/10/2015	3.16
5/11/2015	3.33
5/12/2015	3.22
5/13/2015	3.35
5/14/2015	3.42
5/15/2015	3.35
5/16/2015	4.15
5/17/2015	3.7
5/18/2015	3.66
5/19/2015	3.45
5/20/2015	3.4
5/21/2015	3.46
5/22/2015	3.27
5/23/2015	3.05
5/24/2015	3.05
5/25/2015	3.21
5/26/2015	3.48
5/27/2015	3.45
5/28/2015	3.67
5/29/2015	3.44
5/30/2015	3.33
5/31/2015	3.36
6/1/2015	3.44
6/2/2015	3.56
6/3/2015	3.49
6/4/2015	3.45
6/5/2015	3.37
6/6/2015	3.15
6/7/2015	3.12

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
6/8/2015	3.27
6/9/2015	3.35
6/10/2015	3.26
6/11/2015	3.3
6/12/2015	3.19
6/13/2015	3.11
6/14/2015	3.13
6/15/2015	3.26
6/16/2015	3.3
6/17/2015	3.21
6/18/2015	3.16
6/19/2015	3.15
6/20/2015	3.02
6/21/2015	3.02
6/22/2015	3.26
6/23/2015	3.22
6/24/2015	3.15
6/25/2015	3.14
6/26/2015	3.1
6/27/2015	2.9
6/28/2015	2.93
6/29/2015	3.27
6/30/2015	3.33
7/1/2015	3.41
7/2/2015	3.23
7/3/2015	3
7/4/2015	2.7
7/5/2015	3.32
7/6/2015	3.55
7/7/2015	3.5
7/8/2015	3.5
7/9/2015	3.3
7/10/2015	3.37
7/11/2015	3.23
7/12/2015	3.27
7/13/2015	3.46
7/14/2015	3.42
7/15/2015	3.48
7/16/2015	3.38
7/17/2015	3.44
7/18/2015	3.22
7/19/2015	3.26
7/20/2015	3.25
7/21/2015	3.45
7/22/2015	3.44
7/23/2015	3.41
7/24/2015	3.39
7/25/2015	3.18
7/26/2015	3.22
7/27/2015	4.04

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
7/28/2015	3.67
7/29/2015	3.55
7/30/2015	3.61
7/31/2015	3.33
8/1/2015	3.13
8/2/2015	3.23
8/3/2015	3.34
8/4/2015	3.3
8/5/2015	3.44
8/6/2015	3.41
8/7/2015	3.33
8/8/2015	3.15
8/9/2015	3.19
8/10/2015	3.36
8/11/2015	3.36
8/12/2015	3.25
8/13/2015	3.37
8/14/2015	3.33
8/15/2015	3.12
8/16/2015	3.29
8/17/2015	3.52
8/18/2015	3.54
8/19/2015	3.61
8/20/2015	3.44
8/21/2015	3.52
8/22/2015	3.44
8/23/2015	3.43
8/24/2015	3.43
8/25/2015	3.31
8/26/2015	3.27
8/27/2015	3.45
8/28/2015	3.81
8/29/2015	3.19
8/30/2015	3.28
8/31/2015	3.4
9/1/2015	3.38
9/2/2015	3.32
9/3/2015	3.62
9/4/2015	3.71
9/5/2015	3.89
9/6/2015	3.47
9/7/2015	3.61
9/8/2015	3.62
9/9/2015	3.64
9/10/2015	3.56
9/11/2015	3.5
9/12/2015	3.28
9/13/2015	3.33
9/14/2015	3.39
9/15/2015	3.6

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
9/16/2015	3.86
9/17/2015	3.58
9/18/2015	3.49
9/19/2015	3.17
9/20/2015	3.18
9/21/2015	3.49
9/22/2015	3.66
9/23/2015	3.53
9/24/2015	3.54
9/25/2015	3.48
9/26/2015	3.27
9/27/2015	3.4
9/28/2015	3.54
9/29/2015	3.53
9/30/2015	3.57
10/1/2015	3.54
10/2/2015	3.54
10/3/2015	3.44
10/4/2015	3.54
10/5/2015	3.58
10/6/2015	3.27
10/7/2015	3.11
10/8/2015	3.13
10/9/2015	3.26
10/10/2015	3.16
10/11/2015	3.34
10/12/2015	3.36
10/13/2015	3.46
10/14/2015	3.37
10/15/2015	3.31
10/16/2015	3.25
10/17/2015	3.12
10/18/2015	3.07
10/19/2015	3.21
10/20/2015	3.23
10/21/2015	3.35
10/22/2015	3.35
10/23/2015	3.26
10/24/2015	3.17
10/25/2015	3.2
10/26/2015	3.3
10/27/2015	3.4
10/28/2015	3.37
10/29/2015	3.42
10/30/2015	3.3
10/31/2015	3.03
11/1/2015	3.24
11/2/2015	3.32
11/3/2015	3.67
11/4/2015	3.38

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
11/5/2015	3.25
11/6/2015	3.17
11/7/2015	3.02
11/8/2015	3.03
11/9/2015	3.15
11/10/2015	3.23
11/11/2015	3.12
11/12/2015	3.21
11/13/2015	3.18
11/14/2015	2.99
11/15/2015	3.06
11/16/2015	3.16
11/17/2015	3.12
11/18/2015	3.2
11/19/2015	3.11
11/20/2015	3.09
11/21/2015	2.95
11/22/2015	2.96
11/23/2015	3.13
11/24/2015	3.05
11/25/2015	3.14
11/26/2015	2.94
11/27/2015	3.06
11/28/2015	3.08
11/29/2015	3.16
11/30/2015	3.18

End of 2016 Local Limits Evaluation Data

1/1/2016	2.85
1/2/2016	2.96
1/3/2016	3.09
1/4/2016	3.05
1/5/2016	3.08
1/6/2016	3.09
1/7/2016	2.94
1/8/2016	3.03
1/9/2016	2.91
1/10/2016	2.95
1/11/2016	3.02
1/12/2016	3.03
1/13/2016	2.99
1/14/2016	2.93
1/15/2016	2.88
1/16/2016	2.76
1/17/2016	2.74
1/18/2016	2.95
1/19/2016	2.88
1/20/2016	2.99
1/21/2016	3.05
1/22/2016	2.9

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
1/23/2016	2.82
1/24/2016	2.82
1/25/2016	3.04
1/26/2016	3.05
1/27/2016	3.17
1/28/2016	3.3
1/29/2016	2.92
1/30/2016	2.89
1/31/2016	2.8
2/1/2016	2.92
2/2/2016	2.99
2/3/2016	2.99
2/4/2016	3
2/5/2016	3.01
2/6/2016	2.91
2/7/2016	2.78
2/8/2016	3
2/9/2016	2.96
2/10/2016	2.98
2/11/2016	3.08
2/12/2016	3.13
2/13/2016	2.96
2/14/2016	2.92
2/15/2016	3.03
2/16/2016	3.05
2/17/2016	3.06
2/18/2016	3.15
2/19/2016	3.08
2/20/2016	2.96
2/21/2016	3.02
2/22/2016	3.06
2/23/2016	3.11
2/24/2016	3.18
2/25/2016	3.18
2/26/2016	3.05
2/27/2016	2.89
2/28/2016	2.94
2/29/2016	3.08
3/1/2016	3.04
3/2/2016	3.11
3/3/2016	3.05
3/4/2016	3.06
3/5/2016	2.94
3/6/2016	2.98
3/7/2016	3.05
3/8/2016	3
3/9/2016	3.04
3/10/2016	2.98
3/11/2016	2.89
3/12/2016	2.77

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
3/13/2016	2.87
3/14/2016	3.01
3/15/2016	3.1
3/16/2016	3.07
3/17/2016	3.09
3/18/2016	3.1
3/19/2016	2.95
3/20/2016	2.88
3/21/2016	3
3/22/2016	3.22
3/23/2016	3.18
3/24/2016	3.09
3/25/2016	3.11
3/26/2016	2.96
3/27/2016	2.75
3/28/2016	3
3/29/2016	2.95
3/30/2016	3.06
3/31/2016	3.03
4/1/2016	3.05
4/2/2016	2.86
4/3/2016	2.87
4/4/2016	3.09
4/5/2016	3.07
4/6/2016	3.03
4/7/2016	2.99
4/8/2016	2.95
4/9/2016	2.82
4/10/2016	2.89
4/11/2016	2.98
4/12/2016	3.09
4/13/2016	3.17
4/14/2016	3.4
4/15/2016	3.47
4/16/2016	3.16
4/17/2016	3.1
4/18/2016	3.2
4/19/2016	3.14
4/20/2016	3.08
4/21/2016	3.07
4/22/2016	3.08
4/23/2016	3.14
4/24/2016	3.24
4/25/2016	3.36
4/26/2016	3.31
4/27/2016	3.41
4/28/2016	3.48
4/29/2016	3.39
4/30/2016	3.16
5/1/2016	3.27

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
5/2/2016	3.45
5/3/2016	3.14
5/4/2016	3.11
5/5/2016	3.13
5/6/2016	3.13
5/7/2016	3
5/8/2016	2.98
5/9/2016	3.53
5/10/2016	3.57
5/11/2016	3.47
5/12/2016	3.39
5/13/2016	3.42
5/14/2016	3.2
5/15/2016	3.39
5/16/2016	3.34
5/17/2016	3.16
5/18/2016	3.07
5/19/2016	3.25
5/20/2016	3.4
5/21/2016	3.46
5/22/2016	3.32
5/23/2016	3.38
5/24/2016	3.34
5/25/2016	3.34
5/26/2016	3.29
5/27/2016	3.28
5/28/2016	2.93
5/29/2016	2.79
5/30/2016	3.05
5/31/2016	0.32
6/1/2016	3.16
6/2/2016	3.2
6/3/2016	3.1
6/4/2016	2.83
6/5/2016	2.88
6/6/2016	3
6/7/2016	3.11
6/8/2016	3.16
6/9/2016	3.09
6/10/2016	3.15
6/11/2016	2.95
6/12/2016	2.93
6/13/2016	3.08
6/14/2016	3.28
6/15/2016	3.41
6/16/2016	3.28
6/17/2016	3.22
6/18/2016	2.88
6/19/2016	2.99
6/20/2016	3.11

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
6/21/2016	3.03
6/22/2016	3.01
6/23/2016	3.1
6/24/2016	3.09
6/25/2016	2.96
6/26/2016	2.9
6/27/2016	3.06
6/28/2016	2.95
6/29/2016	2.97
6/30/2016	2.94
7/1/2016	2.7
7/2/2016	2.47
7/3/2016	2.41
7/4/2016	2.46
7/5/2016	2.82
7/6/2016	2.96
7/7/2016	2.95
7/8/2016	2.79
7/9/2016	2.66
7/10/2016	3.23
7/11/2016	3.17
7/12/2016	3.05
7/13/2016	2.97
7/14/2016	2.99
7/15/2016	2.82
7/16/2016	2.71
7/17/2016	2.77
7/18/2016	2.96
7/19/2016	2.72
7/20/2016	2.82
7/21/2016	2.94
7/22/2016	2.87
7/23/2016	2.62
7/24/2016	2.7
7/25/2016	3.03
7/26/2016	2.94
7/27/2016	2.95
7/28/2016	3.07
7/29/2016	2.7
7/30/2016	2.57
7/31/2016	2.75
8/1/2016	2.85
8/2/2016	2.9
8/3/2016	2.95
8/4/2016	2.98
8/5/2016	2.83
8/6/2016	2.8
8/7/2016	2.92
8/8/2016	3
8/9/2016	3.1

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
8/10/2016	3.01
8/11/2016	3.05
8/12/2016	2.81
8/13/2016	2.65
8/14/2016	2.69
8/15/2016	2.86
8/16/2016	2.9
8/17/2016	2.83
8/18/2016	3.18
8/19/2016	3.16
8/20/2016	2.88
8/21/2016	2.82
8/22/2016	2.98
8/23/2016	2.98
8/24/2016	3.54
8/25/2016	3.07
8/26/2016	2.93
8/27/2016	2.72
8/28/2016	2.8
8/29/2016	2.96
8/30/2016	2.88
8/31/2016	2.91
9/1/2016	3.06
9/2/2016	2.99
9/3/2016	2.72
9/4/2016	2.88
9/5/2016	3.26
9/6/2016	3.19
9/7/2016	3.07
9/8/2016	2.99
9/9/2016	3.04
9/10/2016	2.78
9/11/2016	2.96
9/12/2016	3.16
9/13/2016	3.19
9/14/2016	3.14
9/15/2016	3.11
9/16/2016	2.97
9/17/2016	2.79
9/18/2016	2.86
9/19/2016	2.98
9/20/2016	3.03
9/21/2016	3.22
9/22/2016	3.33
9/23/2016	3.05
9/24/2016	2.93
9/25/2016	3.01
9/26/2016	3.08
9/27/2016	3.04
9/28/2016	3.12

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City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
9/29/2016	3.2
9/30/2016	3.09
10/1/2016	2.93
10/2/2016	3.1
10/3/2016	3.44
10/4/2016	3.22
10/5/2016	3.61
10/6/2016	3.4
10/7/2016	3.27
10/8/2016	2.91
10/9/2016	2.95
10/10/2016	3.31
10/11/2016	3.41
10/12/2016	3.37
10/13/2016	3.41
10/14/2016	3.41
10/15/2016	3.3
10/16/2016	3.39
10/17/2016	3.41
10/18/2016	3.53
10/19/2016	3.42
10/20/2016	3.51
10/21/2016	3.31
10/22/2016	3.18
10/23/2016	3.26
10/24/2016	3.35
10/25/2016	3.42
10/26/2016	3.26
10/27/2016	3.36
10/28/2016	3.34
10/29/2016	3.19
10/30/2016	3.59
10/31/2016	3.34
11/1/2016	3.42
11/2/2016	3.43
11/3/2016	3.35
11/4/2016	3.39
11/5/2016	3.26
11/6/2016	3.21
11/7/2016	3.32
11/8/2016	3.29
11/9/2016	3.25
11/10/2016	3.31
11/11/2016	3.26
11/12/2016	3.13
11/13/2016	3.04
11/14/2016	3.1
11/15/2016	3.23
11/16/2016	3.19
11/17/2016	3.39

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
11/18/2016	3.38
11/19/2016	3.16
11/20/2016	3.18
11/21/2016	3.26
11/22/2016	3.34
11/23/2016	3.29
11/24/2016	3.08
11/25/2016	2.82
11/26/2016	3.03
11/27/2016	3.2
11/28/2016	3.16
11/29/2016	3.17
11/30/2016	3.01
12/1/2016	3.01
12/2/2016	3.05
12/3/2016	2.85
12/4/2016	2.9
12/5/2016	3.03
12/6/2016	3.27
12/7/2016	3.25
12/8/2016	3.36
12/9/2016	3.21
12/10/2016	3
12/11/2016	2.99
12/12/2016	3.13
12/13/2016	3.2
12/14/2016	3.14
12/15/2016	3.32
12/16/2016	3.28
12/17/2016	3.39
12/18/2016	3.39
12/19/2016	3.43
12/20/2016	3.2
12/21/2016	3.16
12/22/2016	3.23
12/23/2016	3.35
12/24/2016	2.94
12/25/2016	2.72
12/26/2016	3.04
12/27/2016	2.91
12/28/2016	3.03
12/29/2016	3.17
12/30/2016	2.93
12/31/2016	2.89
1/1/2017	2.86
1/2/2017	3.23
1/3/2017	3.19
1/4/2017	3.37
1/5/2017	3.44
1/6/2017	3.32

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
1/7/2017	3.13
1/8/2017	3.06
1/9/2017	3.13
1/10/2017	3.32
1/11/2017	3.33
1/12/2017	3.3
1/13/2017	3.41
1/14/2017	3.34
1/15/2017	3.23
1/16/2017	3.44
1/17/2017	3.28
1/18/2017	3.32
1/19/2017	3.14
1/20/2017	3.27
1/21/2017	3.25
1/22/2017	3.16
1/23/2017	3.19
1/24/2017	3.3
1/25/2017	3.21
1/26/2017	3.28
1/27/2017	3.27
1/28/2017	3.13
1/29/2017	3.14
1/30/2017	3.23
1/31/2017	3.23
2/1/2017	3.3
2/2/2017	3.39
2/3/2017	3.4
2/4/2017	3.13
2/5/2017	3.11
2/6/2017	3.29
2/7/2017	3.53
2/8/2017	3.38
2/9/2017	3.6
2/10/2017	3.66
2/11/2017	3.12
2/12/2017	3.27
2/13/2017	3.31
2/14/2017	3.56
2/15/2017	3.53
2/16/2017	3.84
2/17/2017	3.59
2/18/2017	3.38
2/19/2017	3.29
2/20/2017	3.51
2/21/2017	3.67
2/22/2017	3.5
2/23/2017	3.39
2/24/2017	3.46
2/25/2017	3.3

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
2/26/2017	3.33
2/27/2017	3.48
2/28/2017	3.28
3/1/2017	3.28
3/2/2017	3.4
3/3/2017	3.34
3/4/2017	3.23
3/5/2017	3.26
3/6/2017	3.19
3/7/2017	3.22
3/8/2017	3.22
3/9/2017	3.22
3/10/2017	3.36
3/11/2017	3.23
3/12/2017	3.26
3/13/2017	3.25
3/14/2017	3.48
3/15/2017	3.46
3/16/2017	3.54
3/17/2017	3.62
3/18/2017	3.24
3/19/2017	3.29
3/20/2017	3.27
3/21/2017	3.58
3/22/2017	3.51
3/23/2017	3.4
3/24/2017	3.52
3/25/2017	3.18
3/26/2017	3.12
3/27/2017	3.25
3/28/2017	3.27
3/29/2017	3.22
3/30/2017	3.16
3/31/2017	3.33
4/1/2017	3.17
4/2/2017	3.18
4/3/2017	3.15
4/4/2017	3.57
4/5/2017	3.43
4/6/2017	3.34
4/7/2017	3.3
4/8/2017	3.28
4/9/2017	3.29
4/10/2017	3.57
4/11/2017	3.45
4/12/2017	3.32
4/13/2017	3.6
4/14/2017	3.39
4/15/2017	3.25
4/16/2017	3.01

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
4/17/2017	3.33
4/18/2017	3.36
4/19/2017	3.22
4/20/2017	3.33
4/21/2017	3.31
4/22/2017	3.04
4/23/2017	3.12
4/24/2017	3.19
4/25/2017	3.26
4/26/2017	3.3
4/27/2017	3.18
4/28/2017	3.27
4/29/2017	3.03
4/30/2017	2.85
5/1/2017	3.16
5/2/2017	3.18
5/3/2017	3.15
5/4/2017	2.96
5/5/2017	2.92
5/6/2017	2.78
5/7/2017	3.1
5/8/2017	3.25
5/9/2017	3.24
5/10/2017	3.1
5/11/2017	2.95
5/12/2017	3
5/13/2017	3.01
5/14/2017	2.97
5/15/2017	3.13
5/16/2017	3.29
5/17/2017	4.15
5/18/2017	3.37
5/19/2017	3.33
5/20/2017	3.15
5/21/2017	3.17
5/22/2017	3.13
5/23/2017	3.15
5/24/2017	3.07
5/25/2017	3.17
5/26/2017	3.07
5/27/2017	2.73
5/28/2017	2.65
5/29/2017	2.83
5/30/2017	3.04
5/31/2017	3.05
6/1/2017	3
6/2/2017	3.08
6/3/2017	2.84
6/4/2017	2.94
6/5/2017	3.04

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
6/6/2017	3.1
6/7/2017	3.04
6/8/2017	2.94
6/9/2017	3
6/10/2017	2.91
6/11/2017	2.91
6/12/2017	3.4
6/13/2017	3.5
6/14/2017	3.17
6/15/2017	3.08
6/16/2017	3.07
6/17/2017	2.91
6/18/2017	2.9
6/19/2017	3.17
6/20/2017	3.24
6/21/2017	3.14
6/22/2017	3.3
6/23/2017	3.26
6/24/2017	3.14
6/25/2017	3.18
6/26/2017	3.11
6/27/2017	3.21
6/28/2017	3.19
6/29/2017	3.28
6/30/2017	3.31
7/1/2017	2.79
7/2/2017	2.89
7/3/2017	2.85
7/4/2017	2.72
7/5/2017	3.12
7/6/2017	3.03
7/7/2017	3.03
7/8/2017	2.82
7/9/2017	2.96
7/10/2017	3.29
7/11/2017	3.19
7/12/2017	3.19
7/13/2017	3.14
7/14/2017	2.97
7/15/2017	2.96
7/16/2017	3.07
7/17/2017	3.08
7/18/2017	3.06
7/19/2017	3.11
7/20/2017	3.04
7/21/2017	2.96
7/22/2017	2.86
7/23/2017	2.85
7/24/2017	3.03
7/25/2017	3.1

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
7/26/2017	3.05
7/27/2017	3.06
7/28/2017	3
7/29/2017	2.84
7/30/2017	2.9
7/31/2017	3.06
8/1/2017	3.03
8/2/2017	3.14
8/3/2017	3.06
8/4/2017	3.05
8/5/2017	3.03
8/6/2017	3.03
8/7/2017	3.14
8/8/2017	3.12
8/9/2017	3.14
8/10/2017	3.15
8/11/2017	3.09
8/12/2017	2.92
8/13/2017	3.12
8/14/2017	3.08
8/15/2017	3.14
8/16/2017	3.14
8/17/2017	3.04
8/18/2017	3.05
8/19/2017	2.8
8/20/2017	2.96
8/21/2017	2.99
8/22/2017	3.6
8/23/2017	3.04
8/24/2017	3.22
8/25/2017	3.07
8/26/2017	2.9
8/27/2017	3.03
8/28/2017	3.07
8/29/2017	3
8/30/2017	3.07
8/31/2017	3.03
9/1/2017	3.03
9/2/2017	2.79
9/3/2017	2.8
9/4/2017	3.07
9/5/2017	3.2
9/6/2017	3.14
9/7/2017	3.15
9/8/2017	3.12
9/9/2017	2.94
9/10/2017	3.03
9/11/2017	3.1
9/12/2017	3.23
9/13/2017	3.05

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
9/14/2017	3.67
9/15/2017	4.11
9/16/2017	3.49
9/17/2017	3.43
9/18/2017	3.54
9/19/2017	3.46
9/20/2017	3.47
9/21/2017	3.42
9/22/2017	3.45
9/23/2017	3.28
9/24/2017	3.3
9/25/2017	3.37
9/26/2017	3.31
9/27/2017	3.3
9/28/2017	3.29
9/29/2017	3.13
9/30/2017	3.05
10/1/2017	3.33
10/2/2017	3.51
10/3/2017	3.55
10/4/2017	3.47
10/5/2017	3.42
10/6/2017	3.18
10/7/2017	2.94
10/8/2017	3.14
10/9/2017	3.21
10/10/2017	3.09
10/11/2017	2.95
10/12/2017	3.05
10/13/2017	2.86
10/14/2017	2.8
10/15/2017	2.79
10/16/2017	2.73
10/17/2017	2.88
10/18/2017	2.74
10/19/2017	2.81
10/20/2017	2.71
10/21/2017	2.78
10/22/2017	2.74
10/23/2017	2.89
10/24/2017	2.9
10/25/2017	2.93
10/26/2017	3.11
10/27/2017	2.94
10/28/2017	2.87
10/29/2017	2.9
10/30/2017	3.15
10/31/2017	3.1
11/1/2017	3.21
11/2/2017	3.36

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
11/3/2017	3.13
11/4/2017	3.26
11/5/2017	3.28
11/6/2017	3.36
11/7/2017	3.37
11/8/2017	3.31
11/9/2017	3.24
11/10/2017	3.2
11/11/2017	3.06
11/12/2017	3.1
11/13/2017	3.21
11/14/2017	3.17
11/15/2017	3.17
11/16/2017	3.24
11/17/2017	3.1
11/18/2017	2.98
11/19/2017	3.06
11/20/2017	3.16
11/21/2017	3.16
11/22/2017	3.07
11/23/2017	2.74
11/24/2017	2.88
11/25/2017	2.91
11/26/2017	2.92
11/27/2017	3.06
11/28/2017	3.26
11/29/2017	3.33
11/30/2017	3.36
12/1/2017	3.32
12/2/2017	3.27
12/3/2017	3.27
12/4/2017	3.35
12/5/2017	3.43
12/6/2017	3.44
12/7/2017	3.53
12/8/2017	3.31
12/9/2017	3.36
12/10/2017	3.3
12/11/2017	3.35
12/12/2017	3.25
12/13/2017	3.2
12/14/2017	3.04
12/15/2017	3.08
12/16/2017	2.86
12/17/2017	2.94
12/18/2017	3.05
12/19/2017	2.98
12/20/2017	2.99
12/21/2017	3.23
12/22/2017	3.17

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
12/23/2017	3.23
12/24/2017	3.18
12/25/2017	2.87
12/26/2017	3.3
12/27/2017	3.21
12/28/2017	3.17
12/29/2017	3.04
12/30/2017	3.08
12/31/2017	3.15
1/1/2018	3.13
1/2/2018	3.34
1/3/2018	3.22
1/4/2018	3.35
1/5/2018	3.07
1/6/2018	2.96
1/7/2018	2.9
1/8/2018	3.03
1/9/2018	3.13
1/10/2018	3.09
1/11/2018	3.19
1/12/2018	3.07
1/13/2018	2.97
1/14/2018	2.85
1/15/2018	3.05
1/16/2018	3.15
1/17/2018	3.1
1/18/2018	3.21
1/19/2018	3
1/20/2018	2.8
1/21/2018	2.91
1/22/2018	3.06
1/23/2018	3.04
1/24/2018	3.01
1/25/2018	2.87
1/26/2018	2.95
1/27/2018	2.88
1/28/2018	2.88
1/29/2018	3.07
1/30/2018	3.39
1/31/2018	3.02
2/1/2018	3.06
2/2/2018	3.66
2/3/2018	3.27
2/4/2018	3.23
2/5/2018	3.24
2/6/2018	3.29
2/7/2018	3.24
2/8/2018	4.19
2/9/2018	3.26
2/10/2018	3.15

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
2/11/2018	3.2
2/12/2018	3.35
2/13/2018	3.23
2/14/2018	3.12
2/15/2018	3.2
2/16/2018	3.11
2/17/2018	2.96
2/18/2018	3.11
2/19/2018	3.39
2/20/2018	3.45
2/21/2018	3.35
2/22/2018	3.31
2/23/2018	3.23
2/24/2018	3.09
2/25/2018	3.1
2/26/2018	3.17
2/27/2018	3.18
2/28/2018	3.29
3/1/2018	3.33
3/2/2018	3.08
3/3/2018	3.15
3/4/2018	3
3/5/2018	3.2
3/6/2018	3.24
3/7/2018	3.38
3/8/2018	3.28
3/9/2018	3.51
3/10/2018	3.4
3/11/2018	3.57
3/12/2018	3.67
3/13/2018	3.6
3/14/2018	4.19
3/15/2018	4.85
3/16/2018	4.19
3/17/2018	3.83
3/18/2018	3.86
3/19/2018	3.97
3/20/2018	4.06
3/21/2018	4.01
3/22/2018	3.95
3/23/2018	3.99
3/24/2018	3.9
3/25/2018	3.89
3/26/2018	3.84
3/27/2018	3.72
3/28/2018	3.68
3/29/2018	3.75
3/30/2018	3.52
3/31/2018	3.68
4/1/2018	3.48

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
4/2/2018	3.82
4/3/2018	3.85
4/4/2018	3.79
4/5/2018	3.78
4/6/2018	3.86
4/7/2018	3.86
4/8/2018	3.74
4/9/2018	3.88
4/10/2018	4.04
4/11/2018	3.93
4/12/2018	4.28
4/13/2018	4.17
4/14/2018	3.94
4/15/2018	3.95
4/16/2018	4.28
4/17/2018	4.26
4/18/2018	4.09
4/19/2018	4.01
4/20/2018	3.83
4/21/2018	3.66
4/22/2018	3.65
4/23/2018	3.84
4/24/2018	3.8
4/25/2018	3.68
4/26/2018	3.87
4/27/2018	2.53
4/28/2018	3.38
4/29/2018	3.73
4/30/2018	3.81
5/1/2018	3.84
5/2/2018	3.84
5/3/2018	3.64
5/4/2018	3.5
5/5/2018	3.4
5/6/2018	3.66
5/7/2018	3.62
5/8/2018	3.7
5/9/2018	4.07
5/10/2018	4.48
5/11/2018	4.33
5/12/2018	4.12
5/13/2018	3.92
5/14/2018	3.96
5/15/2018	3.94
5/16/2018	3.78
5/17/2018	3.97
5/18/2018	4.01
5/19/2018	3.83
5/20/2018	3.76
5/21/2018	3.82

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
5/22/2018	3.84
5/23/2018	3.84
5/24/2018	3.6
5/25/2018	3.63
5/26/2018	3.29
5/27/2018	3.28
5/28/2018	3.39
5/29/2018	3.75
5/30/2018	4.04
5/31/2018	4.93
6/1/2018	4.45
6/2/2018	4.29
6/3/2018	3.95
6/4/2018	4.03
6/5/2018	4.02
6/6/2018	3.96
6/7/2018	3.94
6/8/2018	3.76
6/9/2018	3.73
6/10/2018	3.91
6/11/2018	4.18
6/12/2018	4.07
6/13/2018	3.88
6/14/2018	3.83
6/15/2018	3.77
6/16/2018	4.63
6/17/2018	4.3
6/18/2018	5.61
6/19/2018	5.93
6/20/2018	5.21
6/21/2018	5.33
6/22/2018	4.83
6/23/2018	4.79
6/24/2018	4.63
6/25/2018	4.63
6/26/2018	4.5
6/27/2018	4.42
6/28/2018	4.47
6/29/2018	4.34
6/30/2018	4.13
7/1/2018	4.11
7/2/2018	4.28
7/3/2018	4.15
7/4/2018	3.82
7/5/2018	3.98
7/6/2018	3.84
7/7/2018	3.71
7/8/2018	3.78
7/9/2018	3.9
7/10/2018	3.83

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
7/11/2018	3.79
7/12/2018	4.05
7/13/2018	3.51
7/14/2018	3.52
7/15/2018	3.6
7/16/2018	3.74
7/17/2018	3.73
7/18/2018	3.69
7/19/2018	3.67
7/20/2018	3.6
7/21/2018	3.43
7/22/2018	3.42
7/23/2018	3.66
7/24/2018	3.57
7/25/2018	3.66
7/26/2018	3.62
7/27/2018	3.54
7/28/2018	3.42
7/29/2018	3.42
7/30/2018	3.59
7/31/2018	3.54
8/1/2018	3.59
8/2/2018	3.44
8/3/2018	3.4
8/4/2018	3.36
8/5/2018	3.43
8/6/2018	3.67
8/7/2018	3.58
8/8/2018	3.46
8/9/2018	3.48
8/10/2018	3.27
8/11/2018	3.18
8/12/2018	3.27
8/13/2018	3.54
8/14/2018	3.55
8/15/2018	3.51
8/16/2018	3.44
8/17/2018	3.45
8/18/2018	3.34
8/19/2018	3.47
8/20/2018	3.86
8/21/2018	3.76
8/22/2018	3.73
8/23/2018	3.7
8/24/2018	3.47
8/25/2018	3.4
8/26/2018	3.54
8/27/2018	3.81
8/28/2018	3.84
8/29/2018	3.68

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
8/30/2018	3.62
8/31/2018	3.67
9/1/2018	3.37
9/2/2018	3.3
9/3/2018	3.51
9/4/2018	4.2
9/5/2018	3.61
9/6/2018	3.55
9/7/2018	3.44
9/8/2018	3.31
9/9/2018	3.48
9/10/2018	3.61
9/11/2018	3.59
9/12/2018	3.62
9/13/2018	3.72
9/14/2018	3.65
9/15/2018	3.67
9/16/2018	3.64
9/17/2018	3.74
9/18/2018	3.73
9/19/2018	3.99
9/20/2018	3.83
9/21/2018	3.8
9/22/2018	3.59
9/23/2018	3.66
9/24/2018	3.6
9/25/2018	3.48
9/26/2018	3.43
9/27/2018	3.45
9/28/2018	3.41
9/29/2018	3.38
9/30/2018	3.57
10/1/2018	3.52
10/2/2018	3.61
10/3/2018	3.59
10/4/2018	3.87
10/5/2018	3.31
10/6/2018	3.31
10/7/2018	3.4
10/8/2018	3.56
10/9/2018	3.87
10/10/2018	3.84
10/11/2018	3.88
10/12/2018	3.71
10/13/2018	3.71
10/14/2018	3.76
10/15/2018	3.68
10/16/2018	3.64
10/17/2018	3.74
10/18/2018	3.61

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Flow Data

Date	Influent Flow (MGD)
10/19/2018	3.46
10/20/2018	3.35
10/21/2018	3.49
10/22/2018	3.56
10/23/2018	3.61
10/24/2018	3.57
10/25/2018	3.51
10/26/2018	3.42
10/27/2018	3.39
10/28/2018	3.5
10/29/2018	3.6
10/30/2018	3.68
10/31/2018	3.58

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City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
TSS Data

Monthly Influent TSS (mg/L)
Monthly Effluent TSS (mg/L)
Weekly Influent TSS (mg/L)
Weekly Effluent TSS (mg/L)

Monthly Influent TSS (lb/day) **6,840**
Monthly Effluent TSS (lb/day) **94**

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	TSS		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
10/1/2014	221	4.9	97.8
10/2/2014	288	4.6	98.4
10/5/2014	190	2.9	98.5
10/6/2014	284	4.4	98.5
10/7/2014	197	8.1	95.9
10/8/2014	259	2.4	99.1
10/9/2014	256	6.1	97.6
10/12/2014	203	2.6	98.7
10/13/2014	197	3	98.5
10/14/2014	228	5	97.8
10/15/2014	207	3.2	98.5
10/16/2014	210	1	99.5
10/19/2014	254	4.1	98.4
10/20/2014	212	2.8	98.7
10/21/2014	243	5.7	97.7
10/22/2014	321	3.9	98.8
10/23/2014	244	2.2	99.1
10/26/2014	227	3.3	98.5
10/27/2014	183	4	97.8
10/28/2014	362	2.8	99.2
10/29/2014	238	6.1	97.4
10/30/2014	202	6.2	96.9
11/2/2014	196	4.6	97.7
11/3/2014	217	4.6	97.9
11/4/2014	439	4.6	99.0
11/5/2014	184	3.3	98.2
11/6/2014	209	3.9	98.1
11/9/2014	342	4.4	98.7
11/10/2014	177	4.5	97.5
11/11/2014	170	4.9	97.1
11/12/2014	186	5.8	96.9
11/13/2014	230	5.5	97.6
11/16/2014	206	4.3	97.9
11/17/2014	189	4	97.9
11/18/2014	227	5	97.8
11/19/2014	195	3.3	98.3
11/20/2014	208	4.1	98.0
11/23/2014	194	4.4	97.7
11/24/2014	202	2.7	98.7
11/25/2014	181	4	97.8
11/26/2014	213	4.8	97.7
11/27/2014	177	2.5	98.6
11/30/2014	168	3.8	97.7
12/1/2014	237	3.7	98.4
12/2/2014	137	2.6	98.1

	Monthly Effluent (mg/L)	Weekly Effluent (mg/L)	Monthly Influent (mg/L)	Weekly Influent (mg/L)	
Oct-14	4.1	4.8	238	255	
Nov-14	4.2	5	215	249	
Dec-14	3.0	3.3	214	240	
Jan-15	4.2	5.7	199	234	
Feb-15	4.5	4.9	238	242	
Mar-15	6.6	7.9	248	266	
Apr-15	5.9	6.4	256	272	
May-15	5.3	6.7	256	284	
Jun-15	3.8	4.6	257	277	
Jul-15	4.9	11.3	260	288	
Aug-15	3.6	6.3	260	276	
Sep-15	2.2	2.3	257	279	
Oct-15	2.2	2.3	258	290	
Nov-15	3.7	4.5	258	261	
Dec-15	3.4	4.1	235	254	
Jan-16	4.1	5	265	284	
Feb-16	4.3	4.7	308	336	
Mar-16	6.6	7.9	248	266	2.53
Apr-16			281.5		2.63
May-16			295.5		2.64
Jun-16			291.5		2.845
Jul-16			290		2.49
Aug-16			368		2.34
Sep-16			392.5		2.58
Oct-16			302		2.895
Nov-16			284.5		2.76
Dec-16			344		2.68
Jan-17			258		2.755
Feb-17			257.5		3.195
Mar-17			250		3.19
Apr-17			243		3.125
May-17			279		3.23
Jun-17			271		2.91
Jul-17			255.5		2.775
Aug-17			273.5		2.815
Sep-17			280		3.12
Oct-17			272		2.81
Nov-17			286		2.84
Dec-17			243.5		2.79
Jan-18			294		2.895
Feb-18			228		3.26
Mar-18			220		3.97
Apr-18			256		3.625
May-18			257		3.895

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	TSS		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
12/3/2014	181	2.2	98.8
12/4/2014	266	2.5	99.1
12/7/2014	230	3.6	98.4
12/8/2014	285	2.5	99.1
12/9/2014	189	2.5	98.7
12/10/2014	241	3.2	98.7
12/11/2014	253	2.2	99.1
12/14/2014	179	2.1	98.8
12/15/2014	223	3.1	98.6
12/16/2014	227	3.8	98.3
12/17/2014	212	3.3	98.4
12/18/2014	172	2.7	98.4
12/21/2014	229	3.7	98.4
12/22/2014	340	2.1	99.4
12/23/2014	212	2.2	99.0
12/24/2014	230	2.9	98.7
12/25/2014	166	3	98.2
12/28/2014	187	2.9	98.4
12/29/2014	160	2.2	98.6
12/30/2014	181	4.5	97.5
12/31/2014	191	4.4	97.7
1/1/2015	167	2.4	98.6
1/4/2015	175	4	97.7
1/5/2015	198	4.4	97.8
1/6/2015	174	3.9	97.8
1/7/2015	199	5	97.5
1/8/2015	171	2.7	98.4
1/11/2015	178	4.8	97.3
1/12/2015	231	3.6	98.4
1/13/2015	135	2.1	98.4
1/14/2015	144	3	97.9
1/15/2015	204	3.1	98.5
1/18/2015	193	3.9	98.0
1/19/2015	222	4.8	97.8
1/20/2015	192	4.1	97.9
1/21/2015	205	2.8	98.6
1/22/2015	228	4.4	98.1
1/25/2015	232	7.4	96.8
1/26/2015	277	6.3	97.7
1/27/2015	190	5.4	97.2
1/28/2015	223	4.9	97.8
1/29/2015	247	4.4	98.2
2/1/2015	199	5.2	97.4
2/2/2015	251	5.6	97.8
2/3/2015	203	4.2	97.9
2/4/2015	285	4.6	98.4
2/5/2015	239	4.8	98.0
2/8/2015	259	5.3	98.0
2/9/2015	247	5.9	97.6
2/10/2015	181	3	98.3
2/11/2015	217	4.1	98.1
2/12/2015	285	4.5	98.4
2/15/2015	177	4.4	97.5
2/16/2015	270	4.2	98.4
2/17/2015	245	4.9	98.0

Jun-18			202.5	4.395
Jul-18			236	3.65
Aug-18			239	3.15
Sep-18			232.5	3.29
Oct-18				
	lb/day	lb/day	lb/day	lb/day
Oct-14	120	140	6,947	7,443
Nov-14	122	146	6,258	7,248
Dec-14	87	96	6,211	6,966
Jan-15	137	186	6,489	7,631
Feb-15	140	153	7,424	7,548
Mar-15	187	223	7,012	7,521
Apr-15	167	181	7,238	7,690
May-15	148	187	7,152	7,935
Jun-15	102	124	6,902	7,439
Jul-15	138	318	7,308	8,094
Aug-15	101	177	7,286	7,734
Sep-15	64	67	7,523	8,167
Oct-15	61	63	7,122	8,006
Nov-15	97	118	6,778	6,857
Dec-15	83	101	5,762	6,228
Jan-16	101	123	6,542	7,011
Feb-16	108	118	7,758	8,463
Mar-16	76.5		5,613	
Apr-16	97		6,174	
May-16	55		6,506	
Jun-16	86		6,917	
Jul-16	48		6,022	
Aug-16	72.5		7,182	
Sep-16	52		8,446	
Oct-16	54.5		7,292	
Nov-16	51		6,549	
Dec-16	62.5		7,689	
Jan-17	78.5		5,928	
Feb-17	91.5		6,861	
Mar-17	178.5		6,651	
Apr-17	125		6,333	
May-17	94.5		7,516	
Jun-17	64		6,577	
Jul-17	52		5,913	
Aug-17	45.5		6,421	
Sep-17	46		7,286	
Oct-17	56		6,374	
Nov-17	71		6,774	
Dec-17	85		5,666	
Jan-18	92.5		7,098	
Feb-18	101		6,199	
Mar-18	117		7,284	
Apr-18	97.5		7,740	
May-18	126.5		8,348	
Jun-18	93		7,422	
Jul-18	77.5		7,184	
Aug-18	116		6,279	
Sep-18	81.5		6,379	

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	TSS		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
2/18/2015	322	4	98.8
2/19/2015	196	2.9	98.5
2/22/2015	198	3.4	98.3
2/23/2015	233	6.7	97.1
2/24/2015	341	5	98.5
2/25/2015	215	3.9	98.2
2/26/2015	194	3.5	98.2
3/1/2015	193	7.8	96.0
3/2/2015	286	6	97.9
3/3/2015	202	5.2	97.4
3/4/2015	186	6	96.8
3/5/2015	337	8.5	97.5
3/8/2015	214	12.7	94.1
3/9/2015	312	7.5	97.6
3/10/2015	239	5.3	97.8
3/11/2015	216	8.6	96.0
3/12/2015	254	5.6	97.8
3/15/2015	300	3.8	98.7
3/16/2015	358	4.8	98.7
3/17/2015	228	7	96.9
3/18/2015	204	11.5	94.4
3/19/2015	240	4.5	98.1
3/22/2015	222	8.8	96.0
3/23/2015	231	4.3	98.1
3/24/2015	226	7.5	96.7
3/25/2015	271	4.2	98.5
3/26/2015	300	4.8	98.4
3/29/2015	256	5.8	97.7
3/30/2015	216	3.1	98.6
3/31/2015	222	8.3	96.3
4/1/2015	197	6.1	96.9
4/2/2015	277	7.2	97.4
4/5/2015	195	5.1	97.4
4/6/2015	307	5.2	98.3
4/7/2015	204	4.5	97.8
4/8/2015	343	2	99.4
4/9/2015	248	6.4	97.4
4/12/2015	208	7.5	96.4
4/13/2015	273	6.8	97.5
4/14/2015	223	5	97.8
4/15/2015	328	6.1	98.1
4/16/2015	261	4.7	98.2
4/19/2015	201	12.6	93.7
4/20/2015	254	2.7	98.9
4/21/2015	388	2.9	99.3
4/22/2015	301	6.1	98.0
4/23/2015	217	6.5	97.0
4/26/2015	191	4.1	97.9
4/27/2015	259	4.4	98.3
4/28/2015	336	4.9	98.5
4/29/2015	217	5.3	97.6
4/30/2015	207	13.4	93.5
5/3/2015	222	4.1	98.2
5/4/2015	263	5.1	98.1
5/5/2015	244	5.6	97.7

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	TSS		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
5/6/2015	395	6	98.5
5/7/2015	257	4.9	98.1
5/10/2015	278	2.8	99.0
5/11/2015	250	6.5	97.4
5/12/2015	240	2.4	99.0
5/13/2015	354	3.6	99.0
5/14/2015	300	2.4	99.2
5/17/2015	202	3.8	98.1
5/18/2015	200	6.3	96.9
5/19/2015	206	4.9	97.6
5/20/2015	250	6.7	97.3
5/21/2015	196	6.5	96.7
5/24/2015	193	7.4	96.2
5/25/2015	250	5	98.0
5/26/2015	383	8.1	97.9
5/27/2015	259	7.7	97.0
5/28/2015	220	5.2	97.6
5/31/2015	204	5.9	97.1
6/1/2015	265	3.3	98.8
6/2/2015	207	4.4	97.9
6/3/2015	311	4.5	98.6
6/4/2015	210	4.9	97.7
6/7/2015	225	6.4	97.2
6/8/2015	273	5	98.2
6/9/2015	334	3.7	98.9
6/10/2015	229	4	98.3
6/11/2015	199	1	99.5
6/14/2015	207	5.1	97.5
6/15/2015	273	3.4	98.8
6/16/2015	323	4.5	98.6
6/17/2015	313	4.2	98.7
6/18/2015	268	2.1	99.2
6/21/2015	247	5.1	97.9
6/22/2015	254	4.9	98.1
6/23/2015	212	2.3	98.9
6/24/2015	378	3.1	99.2
6/25/2015	208	1	99.5
6/28/2015	217	4.9	97.7
6/29/2015	282	2	99.3
6/30/2015	224	1	99.6
7/1/2015	282	2.5	99.1
7/2/2015	313	2.3	99.3
7/5/2015	247	3.3	98.7
7/6/2015	249	3.2	98.7
7/7/2015	219	4	98.2
7/8/2015	252	2	99.2
7/9/2015	218	2.1	99.0
7/12/2015	234	4.4	98.1
7/13/2015	270	33.5	87.6
7/14/2015	244	7	97.1
7/15/2015	262	4.8	98.2
7/16/2015	226	6.9	96.9
7/19/2015	254	3.2	98.7
7/20/2015	383	2.8	99.3
7/21/2015	247	4	98.4

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	TSS		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
7/22/2015	304	2	99.3
7/23/2015	252	7.2	97.1
7/26/2015	229	2.5	98.9
7/27/2015	339	3.5	99.0
7/28/2015	219	2.1	99.0
7/29/2015	254	2.5	99.0
7/30/2015	221	2.2	99.0
8/2/2015	164	2	98.8
8/3/2015	257	1	99.6
8/4/2015	233	1	99.6
8/5/2015	254	1	99.6
8/6/2015	225	2.1	99.1
8/9/2015	263	3.3	98.7
8/10/2015	258	1	99.6
8/11/2015	272	2.3	99.2
8/12/2015	238	1	99.6
8/13/2015	268	3.4	98.7
8/16/2015	304	9.2	97.0
8/17/2015	205	6.5	96.8
8/18/2015	319	6.1	98.1
8/19/2015	187	5.3	97.2
8/20/2015	364	4.4	98.8
8/23/2015	246	5.8	97.6
8/24/2015	253	4	98.4
8/25/2015	274	4.5	98.4
8/26/2015	243	3	98.8
8/27/2015	312	1	99.7
8/30/2015	277	1	99.6
8/31/2015	308	2.2	99.3
9/1/2015	256	1	99.6
9/2/2015	241	2.6	98.9
9/3/2015	249	2.3	99.1
9/6/2015	248	2.1	99.2
9/7/2015	217	1	99.5
9/8/2015	272	2.1	99.2
9/9/2015	231	1	99.6
9/10/2015	290	1	99.7
9/13/2015	255	1	99.6
9/14/2015	245	1	99.6
9/15/2015	259	3.5	98.6
9/16/2015	245	1	99.6
9/17/2015	218	2	99.1
9/20/2015	249	2.8	98.9
9/21/2015	256	2.1	99.2
9/22/2015	332	2	99.4
9/23/2015	230	1	99.6
9/24/2015	329	1	99.7
9/27/2015	257	2.2	99.1
9/28/2015	227	1	99.6
9/29/2015	264	1	99.6
9/30/2015	273	1	99.6
10/1/2015	309	1	99.7
10/4/2015	267	3.2	98.8
10/5/2015	209	2	99.0
10/6/2015	286	1	99.7

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	TSS		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
10/7/2015	214	2.3	98.9
10/8/2015	193	2.1	98.9
10/11/2015	232	2	99.1
10/12/2015	265	2.7	99.0
10/13/2015	249	1	99.6
10/14/2015	241	1	99.6
10/15/2015	245	2.9	98.8
10/18/2015	269	1	99.6
10/19/2015	246	1	99.6
10/20/2015	287	1	99.7
10/21/2015	282	1	99.6
10/22/2015	366	1	99.7
10/25/2015	247	2.2	99.1
10/26/2015	278	1	99.6
10/27/2015	249	1	99.6
10/28/2015	267	1	99.6
10/29/2015	212	1	99.5
11/1/2015	160	2.1	98.7
11/2/2015	367	2.1	99.4
11/3/2015	297	2.4	99.2
11/4/2015	219	2.3	98.9
11/5/2015	263	1	99.6
11/8/2015	130	2.3	98.2
11/9/2015	265	2.1	99.2
11/10/2015	227	6.5	97.1
11/11/2015	336	3.7	98.9
11/12/2015	316	2.6	99.2
11/15/2015	252	4.5	98.2
11/16/2015	326	3.5	98.9
11/17/2015	257	3.8	98.5
11/18/2015	248	5.4	97.8
11/19/2015	206	3.8	98.2
11/22/2015	230	5.3	97.7
11/23/2015	359	4.3	98.8
11/24/2015	233	4.9	97.9
11/25/2015	209	4.4	97.9
11/26/2015	198	3.7	98.1
11/29/2015	234	5.4	97.7
11/30/2015	350	4	98.9

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
BOD Data

Monthly Influent BOD (mg/L)		**Monthly Influent BOD (lb/day)**	**7,719**
Monthly Effluent BOD (mg/L)		**Monthly Effluent BOD (lb/day)**	**89**
Weekly Influent BOD (mg/L)			
Weekly Effluent BOD (mg/L)			

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	BOD		
	Influent (mg/L)	**Effluent (mg/L)**	**% Removal (%)**
10/1/2014	217	4.6	97.9
10/2/2014	266	4	98.5
10/5/2014	336	2.9	99.1
10/6/2014	297	6.4	97.8
10/7/2014	234	2.9	98.8
10/8/2014	273	3.7	98.6
10/9/2014	255	2.5	99.0
10/12/2014	241	3.5	98.5
10/13/2014	214	1	99.5
10/14/2014	244	4.9	98.0
10/15/2014	267	2.5	99.1
10/16/2014	251	2.3	99.1
10/19/2014	264	3.1	98.8
10/20/2014	230	3.8	98.3
10/21/2014	278	2.2	99.2
10/22/2014	255	2.9	98.9
10/23/2014	304	2.4	99.2
10/26/2014	267	2.6	99.0
10/27/2014	214	2.3	98.9
10/28/2014	274	2.7	99.0
10/29/2014	254	3	98.8
10/30/2014	274	3.1	98.9
11/2/2014	320	4.2	98.7
11/3/2014	228	3.1	98.6
11/4/2014	236	2.9	98.8
11/5/2014	199	3.5	98.2
11/6/2014	233	3.6	98.5
11/9/2014	239	4.9	97.9
11/10/2014	239	5.1	97.9
11/11/2014	259	4.6	98.2
11/12/2014	236	4.4	98.1
11/13/2014	231	4	98.3
11/16/2014	223	3.1	98.6
11/17/2014	243	3.2	98.7
11/18/2014	249	2.7	98.9
11/19/2014	264	2.5	99.1
11/20/2014	278	2.4	99.1
11/23/2014	236	3.2	98.6
11/24/2014	223	2.5	98.9
11/25/2014	233	3	98.7
11/26/2014	267	3.4	98.7
11/27/2014	214	3.2	98.5
11/30/2014	198	2.5	98.7
12/1/2014	236	2.5	98.9
12/2/2014	297	2.8	99.1

	Monthly Effluent (mg/L)	**Weekly Effluent (mg/L)**	**Monthly Influent (mg/L)**	**Weekly Influent (mg/L)**	
Oct-14	3.2	3.7	260	279	
Nov-14	3.4	4.6	240	251	
Dec-14	2.5	3	249	251	
Jan-15	3.8	4.2	237	269	
Feb-15	4.4	4.9	244	268	
Mar-15	6.2	6.6	262	274	
Apr-15	4.4	5.2	275	286	
May-15	4.2	47	260	279	
Jun-15	3.4	3.8	248	265	
Jul-15	2.8	4.1	256	288	
Aug-15	3.3	3.6	262	286	
Sep-15	2.5	3.8	272	288	
Oct-15	2.5	3	262	270	
Nov-15	3.5	4	272	283	
Dec-15	2.7	3	269	279	
Jan-16	3.5	4.6	284	291	
Feb-16	4.9	5.3	284	299	
Mar-16	6.2	6.6	262	274	3.115
Apr-16			304.5		3.305
May-16			302		3.365
Jun-16			298.5		3.235
Jul-16			281.5		3.025
Aug-16			311		3.235
Sep-16			305.5		3.185
Oct-16			301		3.465
Nov-16			302.5		3.325
Dec-16			331		3.275
Jan-17			304		3.34
Feb-17			277		3.625
Mar-17			268.5		3.47
Apr-17			278		3.435
May-17			273.5		3.625
Jun-17			283		3.305
Jul-17			271.5		3.145
Aug-17			269.5		3.335
Sep-17			259		3.685
Oct-17			250		3.28
Nov-17			250		3.265
Dec-17			265.5		3.36
Jan-18			285		3.22
Feb-18			278.5		3.73
Mar-18			238		4.27
Apr-18			237.5		4.055
May-18			242.5		4.38

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	BOD		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
12/3/2014	256	2.5	99.0
12/4/2014	266	2.3	99.1
12/7/2014	256	3.1	98.8
12/8/2014	246	2.2	99.1
12/9/2014	226	2.4	98.9
12/10/2014	252	2.2	99.1
12/11/2014	248	2.5	99.0
12/14/2014	252	2.5	99.0
12/15/2014	253	2.3	99.1
12/16/2014	258	2.6	99.0
12/17/2014	241	2.5	99.0
12/18/2014	248	2.4	99.0
12/21/2014	251	2.8	98.9
12/22/2014	288	1	99.7
12/23/2014	236	2.4	99.0
12/24/2014	231	2.6	98.9
12/25/2014	232	1	99.6
12/28/2014	230	2.9	98.7
12/29/2014	222	2	99.1
12/30/2014	237	2.7	98.9
12/31/2014	263	3.3	98.7
1/1/2015	219	4	98.2
1/4/2015	229	4.1	98.2
1/5/2015	244	4.8	98.0
1/6/2015	223	4	98.2
1/7/2015	233	3.8	98.4
1/8/2015	221	4.1	98.1
1/11/2015	218	4	98.2
1/12/2015	251	3.6	98.6
1/13/2015	232	4.3	98.1
1/14/2015	258	4.5	98.3
1/15/2015	215	4.2	98.0
1/18/2015	240	4.9	98.0
1/19/2015	238	2.4	99.0
1/20/2015	233	3.3	98.6
1/21/2015	248	3.5	98.6
1/22/2015	387	3.3	99.1
1/25/2015	188	2.8	98.5
1/26/2015	226	3.5	98.5
1/27/2015	198	3.6	98.2
1/28/2015	239	3.8	98.4
1/29/2015	242	3.7	98.5
2/1/2015	224	4.8	97.9
2/2/2015	228	4.5	98.0
2/3/2015	232	3.8	98.4
2/4/2015	236	4.1	98.3
2/5/2015	257	3.7	98.6
2/8/2015	251	5.8	97.7
2/9/2015	226	4	98.2
2/10/2015	231	3.5	98.5
2/11/2015	235	4.1	98.3
2/12/2015	260	4.3	98.3
2/15/2015	191	4.2	97.8
2/16/2015	259	4	98.5
2/17/2015	216	3.7	98.3

Jun-18			204.5	5.16
Jul-18			226	4
Aug-18			239	3.695
Sep-18			229.5	3.9

	lb/day	lb/day	lb/day	lb/day
Oct-14	93	108	7,589	8,144
Nov-14	99	134	6,986	7,306
Dec-14	73	87	7,227	7,285
Jan-15	124	137	7,728	8,772
Feb-15	137	153	7,611	8,359
Mar-15	175	187	7,407	7,747
Apr-15	124	147	7,775	8,086
May-15	117	1313	7,264	7,795
Jun-15	91	102	6,660	7,117
Jul-15	79	115	7,195	8,094
Aug-15	92	101	7,342	8,014
Sep-15	73	111	7,962	8,431
Oct-15	69	83	7,233	7,453
Nov-15	92	105	7,146	7,435
Dec-15	66	74	6,596	6,841
Jan-16	86	114	7,011	7,184
Feb-16	123	133	7,153	7,531
Mar-16	122.5		6,807	
Apr-16	120.5		8,393	
May-16	67.5		8,475	
Jun-16	72.5		8,054	
Jul-16	60.5		7,102	
Aug-16	51		8,391	
Sep-16	48		8,115	
Oct-16	59		8,698	
Nov-16	60		8,388	
Dec-16	55		9,041	
Jan-17	81		8,468	
Feb-17	101.5		8,374	
Mar-17	166		7,770	
Apr-17	114.5		7,964	
May-17	98		8,269	
Jun-17	64		7,801	
Jul-17	71.5		7,121	
Aug-17	57		7,496	
Sep-17	46.5		7,960	
Oct-17	57.5		6,839	
Nov-17	81		6,808	
Dec-17	82.5		7,440	
Jan-18	110		7,654	
Feb-18	109.5		8,664	
Mar-18	121		8,476	
Apr-18	93.5		8,032	
May-18	109.5		8,858	
Jun-18	77.5		8,801	
Jul-18	87		7,539	
Aug-18	59.5		7,365	

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	BOD		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
2/18/2015	272	3.9	98.6
2/19/2015	226	5.8	97.4
2/22/2015	254	3.6	98.6
2/23/2015	259	6	97.7
2/24/2015	318	5.5	98.3
2/25/2015	284	3.9	98.6
2/26/2015	226	5.4	97.6
3/1/2015	261	8.8	96.6
3/2/2015	271	6.6	97.6
3/3/2015	258	5.1	98.0
3/4/2015	235	5.4	97.7
3/5/2015	281	5.5	98.0
3/8/2015	255	8.5	96.7
3/9/2015	279	7.2	97.4
3/10/2015	274	5.9	97.8
3/11/2015	294	6.5	97.8
3/12/2015	266	4.9	98.2
3/15/2015	267	6.6	97.5
3/16/2015	312	3.6	98.8
3/17/2015	235	7.2	96.9
3/18/2015	236	7.9	96.7
3/19/2015	243	7	97.1
3/22/2015	228	7.3	96.8
3/23/2015	299	6.8	97.7
3/24/2015	262	8	96.9
3/25/2015	293	5.1	98.3
3/26/2015	249	4	98.4
3/29/2015	260	5.9	97.7
3/30/2015	235	2.6	98.9
3/31/2015	232	5.4	97.7
4/1/2015	264	6.8	97.4
4/2/2015	319	5.4	98.3
4/5/2015	252	7.8	96.9
4/6/2015	378	3.9	99.0
4/7/2015	249	3.2	98.7
4/8/2015	317	4.4	98.6
4/9/2015	236	5.5	97.7
4/12/2015	276	5.1	98.2
4/13/2015	277	2.4	99.1
4/14/2015	246	2.9	98.8
4/15/2015	229	3.5	98.5
4/16/2015	264	2.4	99.1
4/19/2015	241	5.1	97.9
4/20/2015	287	3.1	98.9
4/21/2015	268	3.9	98.5
4/22/2015	288	3.3	98.9
4/23/2015	266	5.7	97.9
4/26/2015	227	4.7	97.9
4/27/2015	255	2.9	98.9
4/28/2015	390	4.6	98.8
4/29/2015	247	3.7	98.5
4/30/2015	263	6.8	97.4
5/3/2015	231	5.8	97.5
5/4/2015	257	3.4	98.7
5/5/2015	299	3.8	98.7

Sep-18	56.5	7,465

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	BOD		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
5/6/2015	368	3.4	99.1
5/7/2015	240	3.1	98.7
5/10/2015	260	3.8	98.5
5/11/2015	287	3.6	98.7
5/12/2015	177	3.8	97.9
5/13/2015	340	3.3	99.0
5/14/2015	309	4.2	98.6
5/17/2015	223	1	99.6
5/18/2015	307	4.2	98.6
5/19/2015	228	3.6	98.4
5/20/2015	251	4.9	98.0
5/21/2015	222	3.7	98.3
5/24/2015	232	3.6	98.4
5/25/2015	254	3.5	98.6
5/26/2015	296	6.3	97.9
5/27/2015	244	5.1	97.9
5/28/2015	207	5	97.6
5/31/2015	229	8.1	96.5
6/1/2015	252	3.1	98.8
6/2/2015	224	3	98.7
6/3/2015	245	2.3	99.1
6/4/2015	196	2.7	98.6
6/7/2015	230	7.9	96.6
6/8/2015	243	2.7	98.9
6/9/2015	261	2.8	98.9
6/10/2015	233	2	99.1
6/11/2015	229	3.3	98.6
6/14/2015	222	8.5	96.2
6/15/2015	273	1	99.6
6/16/2015	234	2.2	99.1
6/17/2015	246	2.9	98.8
6/18/2015	242	1	99.6
6/21/2015	297	7.1	97.6
6/22/2015	241	1	99.6
6/23/2015	244	2.1	99.1
6/24/2015	316	1	99.7
6/25/2015	227	1	99.6
6/28/2015	254	7.9	96.9
6/29/2015	262	1	99.6
6/30/2015	277	1	99.6
7/1/2015	251	1	99.6
7/2/2015	221	1	99.5
7/5/2015	232	5	97.8
7/6/2015	223	1	99.6
7/7/2015	268	1	99.6
7/8/2015	273	1	99.6
7/9/2015	218	1	99.5
7/12/2015	249	9	96.4
7/13/2015	273	5.6	97.9
7/14/2015	233	1	99.6
7/15/2015	281	1	99.6
7/16/2015	250	1	99.6
7/19/2015	268	3.6	98.7
7/20/2015	321	1	99.7
7/21/2015	266	1	99.6

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	BOD		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
7/22/2015	290	1	99.7
7/23/2015	297	2.8	99.1
7/26/2015	253	4.2	98.3
7/27/2015	244	1	99.6
7/28/2015	239	1	99.6
7/29/2015	253	1	99.6
7/30/2015	222	1	99.5
8/2/2015	244	7.7	96.8
8/3/2015	191	1	99.5
8/4/2015	257	1	99.6
8/5/2015	249	1	99.6
8/6/2015	225	1	99.6
8/9/2015	258	7.5	97.1
8/10/2015	254	1	99.6
8/11/2015	269	1	99.6
8/12/2015	271	1	99.6
8/13/2015	251	1	99.6
8/16/2015	242	1	99.6
8/17/2015	233	1	99.6
8/18/2015	272	1	99.6
8/19/2015	210	1	99.5
8/20/2015	281	1	99.6
8/23/2015	272	7.3	97.3
8/24/2015	317	2.4	99.2
8/25/2015	269	3.4	98.7
8/26/2015	249	2.5	99.0
8/27/2015	321	2.2	99.3
8/30/2015	337	10.2	97.0
8/31/2015	299	2.4	99.2
9/1/2015	278	1	99.6
9/2/2015	250	2.4	99.0
9/3/2015	278	1	99.6
9/6/2015	256	4.4	98.3
9/7/2015	242	1	99.6
9/8/2015	255	1	99.6
9/9/2015	252	1	99.6
9/10/2015	310	1	99.7
9/13/2015	281	5.9	97.9
9/14/2015	281	1	99.6
9/15/2015	276	2.7	99.0
9/16/2015	253	2.3	99.1
9/17/2015	218	1	99.5
9/20/2015	319	3.6	98.9
9/21/2015	265	1	99.6
9/22/2015	297	1	99.7
9/23/2015	234	1	99.6
9/24/2015	306	1	99.7
9/27/2015	265	3.7	98.6
9/28/2015	260	1	99.6
9/29/2015	286	1	99.7
9/30/2015	332	1	99.7
10/1/2015	313	1	99.7
10/4/2015	276	3.5	98.7
10/5/2015	267	2	99.3
10/6/2015	322	2.1	99.3

Detection Limit is 2.0 mg/L for TSS and BOD.
Where <2.0 mg/L, half of detection limit (1.0 mg/L) assigned.

	BOD		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
10/7/2015	246	1	99.6
10/8/2015	239	1	99.6
10/11/2015	228	2.4	98.9
10/12/2015	282	1	99.6
10/13/2015	262	1	99.6
10/14/2015	248	1	99.6
10/15/2015	206	1	99.5
10/18/2015	239	4	98.3
10/19/2015	263	2.9	98.9
10/20/2015	246	2.9	98.8
10/21/2015	275	2.7	99.0
10/22/2015	253	2.4	99.1
10/25/2015	239	3.5	98.5
10/26/2015	301	2.5	99.2
10/27/2015	272	2.5	99.1
10/28/2015	286	2.3	99.2
10/29/2015	234	2.4	99.0
11/1/2015	320	3.4	98.9
11/2/2015	314	9	97.1
11/3/2015	285	2.5	99.1
11/4/2015	262	2.6	99.0
11/5/2015	235	2.4	99.0
11/8/2015	259	3.4	98.7
11/9/2015	244	3	98.8
11/10/2015	246	3.3	98.7
11/11/2015	345	2.8	99.2
11/12/2015	249	3.1	98.8
11/15/2015	253	3.6	98.6
11/16/2015	302	2.9	99.0
11/17/2015	277	3.3	98.8
11/18/2015	255	3.4	98.7
11/19/2015	222	3.4	98.5
11/22/2015	242	4.6	98.1
11/23/2015	317	3.3	99.0
11/24/2015	278	3.5	98.7
11/25/2015	267	3.5	98.7
11/26/2015	222	3.8	98.3
11/29/2015	292	4.1	98.6
11/30/2015	303	2.9	99.0

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Oil & Grease Data

	Influent (mg/L)	Effluent (mg/L)
Oct-14	NA	<1
Jan-15	2	<1
Jul-15	9	<1
Oct-15	24	<1
Jan-16		<1
Apr-16		<1
Jul-16		<1
Oct-16		<1
Jan-17	1.0	<1
Apr-17	1.0	<1
Jul-17	<1	<1
Oct-17	2	<1
Jan-18	2	<1
Apr-18	<1	<1
Jul-18	<1	<1
Oct-18	<1	<1

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Ammonia Data

Monthly Influent Ammonia (mg/L)	27.1
Monthly Effluent Ammonia (mg/L)	0.25

Detection Limit is 0.1 mg/L for ammonia.
Where <0.1 mg/L, half of detection limit (0.05 mg/L) assigned.

	Ammonia		
	Influent (mg/L)	**Effluent (mg/L)**	**% Removal (%)**
10/1/2014	14.6	1.26	91.4
10/5/2014	18.8	0.05	99.7
10/12/2014	27.7	0.22	99.2
10/19/2014	32.1	0.05	99.8
10/26/2014	14.5	0.05	99.7
11/2/2014	34.8	0.14	99.6
11/9/2014	24.2	0.13	99.5
11/16/2014	26.5	0.1	99.6
11/23/2014	17.8	0.05	99.7
12/1/2014	18.5	0.05	99.7
12/7/2014	24.1	0.14	99.4
12/14/2014	10.2	0.05	99.5
12/21/2014	22.9	0.05	99.8
12/28/2014	22.3	0.67	97.0
1/4/2015	24.4	0.47	98.1
1/11/2015	25.9	0.11	99.6
1/19/2015	18.3	0.05	99.7
2/25/2015	17	0.05	99.7
2/1/2015	20.2	0.88	95.6
2/8/2015	24.5	1.26	94.9
2/15/2015	36.4	0.17	99.5
2/22/2015	16.9	0.23	98.6
3/1/2015	33.5	0.41	98.8
3/8/2015	16.6	0.2	98.8
3/15/2015	41.9	0.23	99.5
3/22/2015	26.9	0.3	98.9
4/1/2015	16.7	0.83	95.0
4/5/2015	21.5	0.12	99.4
4/12/2015	37	0.11	99.7
4/19/2015	41.6	0.22	99.5
4/26/2015	22.4	0.17	99.2
5/3/2015	13.7	0.16	98.8
5/10/2015	20.7	0.05	99.8
5/17/2015	18.9	0.05	99.7
5/25/2015	18.2	0.11	99.4
6/1/2015	28.2	0.05	99.8
6/7/2015	36.7	0.05	99.9
6/14/2015	24.3	0.05	99.8
6/21/2015	23.1	0.2	99.1
7/1/2015	22.3	0.05	99.8
7/5/2015	18.5	0.05	99.7
7/12/2015	22.8	0.12	99.5
7/19/2015	24.3	0.1	99.6
7/26/2015	19.5	0.05	99.7
8/2/2015	34.6	0.24	99.3
8/9/2015	32.6	0.1	99.7
8/16/2015	28	0.69	97.5
8/23/2015	28.2	0.2	99.3
9/1/2015	20.2	0.09	99.6
9/7/2015	22.3	0.09	99.6
9/13/2015	29.2	0.15	99.5
9/20/2015	25.99	0.14	99.5

	Monthly Effluent (mg/L)	**Weekly Effluent (mg/L)**	**Monthly Influent (mg/L)**
Oct-14	0.35	1.26	
Nov-14	0.12	0.14	
Dec-14	0.22	0.67	
Jan-15	0.20	0.47	
Feb-15	0.64	1.26	
Mar-15	0.29	0.41	
Apr-15	0.29	0.83	
May-15	0.12	0.16	
Jun-15	0.13	0.20	
Jul-15	0.10	0.12	
Aug-15	0.31	0.69	
Sep-15	0.12	0.15	
Oct-15	0.14	0.22	
Nov-15	0.15	0.35	
Dec-15	0.14	0.46	
Jan-16			
Feb-16			
Mar-16			
Apr-16			
May-16			
Jun-16			
Jul-16			
Aug-16			
Sep-16			
Oct-16			
Nov-16			
Dec-16			
Jan-17			
Feb-17			
Mar-17			
Apr-17			
May-17			
Jun-17			
Jul-17			
Aug-17			
Sep-17			
Oct-17			
Nov-17			
Dec-17			
Jan-18			
Feb-18			
Mar-18			
Apr-18			
May-18			
Jun-18			
Jul-18			
Aug-18			
Sep-18			
Oct-18			

	Inf (mg/L)	**Eff (mg/L)**
Jan-16		
Apr-16		
Jul-16		
Oct-16		
Jan-17	33.4	0.21
Apr-17	11.6	0.73
Jul-17	25.5	0.1
Oct-17	38.6	0.15
Jan-18	28.91	0.67
Apr-18	29.7	0.44
Jul-18	18.7	0.1
Oct-18	30.5	0.1

Detection Limit is 0.1 mg/L for ammonia.
Where <0.1 mg/L, half of detection limit (0.05 mg/L) assigned.

	Ammonia		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
9/27/2015	27.3	0.15	99.5
10/4/2015	28.5	0.15	99.5
10/11/2015	26.7	0.22	99.2
10/18/2015	22	0.11	99.5
10/25/2015	22	0.09	99.6
11/1/2015	15.9	0.35	97.8
11/8/2015	25.2	0.1	99.6
11/15/2015	23.3	0.08	99.7
11/22/2015	26.7	0.07	99.7

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Total Nitrogen Data

2014 Monthly Effluent TN (mg/L)	5.41	**2014 Monthly Effluent TN (lb/day)**	133
2014 Weekly Effluent TN (mg/L)	6.87	**2014 Weekly Effluent TN (lb/day)**	159
2015 Monthly Effluent TN (mg/L)	5.67	**2015 Monthly Effluent TN (lb/day)**	132
2015 Weekly Effluent TN (mg/L)	6.83	**2015 Weekly Effluent TN (lb/day)**	161
		2016 Monthly Influent	882
		2016Monthly Effluent	122
		2017-18 Monthly Influent	1301
		2017-18 Monthly Effluent	128

	Total Nitrogen		
	Influent (mg/L)	**Effluent (mg/L)**	**% Removal (%)**
10/1/2014	50.6	8.1	84.0
10/5/2014	21.1	5.09	75.9
10/12/2014	40.7	6.18	84.8
10/19/2014	39.4	4.93	87.5
10/26/2014	56.9	6.31	88.9
11/2/2014	53.3	8.35	84.3
11/9/2014	46.4	4.56	90.2
11/16/2014	47.6	4.5	90.5
11/23/2014	25.6	4.17	83.7
12/1/2014	45.4	4.25	90.6
12/7/2014	28.6	5.76	79.9
12/14/2014	10.5	2.66	74.7
12/21/2014	37.4	5.88	84.3
12/28/2014	27.8	4.91	82.3
1/4/2015	35.3	5.94	83.2
1/11/2015	31.2	3.44	89.0
1/19/2015	24.3	4.32	82.2
2/25/2015	27.4	3.58	86.9
2/1/2015	24.3	5.83	76.0
2/8/2015	25.9	6.77	73.9
2/15/2015	46.7	8.23	82.4
2/22/2015	29.6	4.48	84.9
3/1/2015	45.6	5.45	88.0
3/8/2015	29.7	5.61	81.1
3/15/2015	44.1	6.05	86.3
3/22/2015	50.1	6.77	86.5
4/1/2015	31.1	6.89	77.8
4/5/2015	30.1	5.04	83.3
4/12/2015	46.1	4.8	89.6
4/19/2015	50.2	5.23	89.6
4/26/2015	28.4	4.89	82.8
5/3/2015	18.9	3.76	80.1
5/10/2015	20.9	3.04	85.5
5/17/2015	40.1	3.9	90.3
5/25/2015	24.4	4.45	81.8
6/1/2015	48.9	6.48	86.7
6/7/2015	47.2	5.97	87.4
6/14/2015	35.6	5.51	84.5
6/21/2015	40.3	5.04	87.5
7/1/2015	50	6.15	87.7
7/5/2015	43.4	4.71	89.1
7/12/2015	40.64	4.94	87.8
7/19/2015	53.9	4.86	91.0

	Monthly Effluent (mg/L)	**Weekly Effluent (mg/L)**	**Monthly Effluent (lb/day)**	**Weekly Effluent (lb/day)**
Jan-14	5.43	6.18	118	124
Feb-14	7.81	11.81	179	271
Mar-14	3.69	4.37	99	113
Apr-14	5.89	6.52	145	170
May-14	5.51	6.35	129	153
Jun-14	6.17	7.35	142	167
Jul-14	5.1	5.64	112	115
Aug-14	5.24	6.68	121	141
Sep-14	7.04	8.65	164	190
Oct-14	6.12	8.10	145	201
Nov-14	5.40	8.35	128	204
Dec-14	1.49	2.41	112	54
Jan-15	4.32	5.94	112	142
Feb-15	6.33	8.23	167	211
Mar-15	5.97	6.77	143	161
Apr-15	5.37	6.89	124	156
May-15	3.79	4.45	89	100
Jun-15	5.75	6.48	134	161
Jul-15	5.35	6.15	121	192
Aug-15	5.75	6.26	129	135
Sep-15	5.00	5.46	120	127
Oct-15	5.26	6.46	121	145
Nov-15	7.95	8.42	174	187
Dec-15	7.16	10.43	148	211

	Inf (mg/L)	**Inf (lb/day)**	**Eff (mg/L)**	**Eff (lb/day)**
Jan-16	30.1	786	4.03	105.2
Apr-16	24.9	686	5.13	141.4
Jul-16	47.1	1,188	5.12	129.2
Oct-16	30	867	3.84	111.0
Jan-17	4.72	131.5	1.16	32.3
Apr-17	63.6	1,822.0	6.84	196.0
Jul-17	34	891.8	4.52	118.6
Oct-17	76.3	2,087.2	4	109.4
Jan-18	44.9	1,205.8	5.16	138.6
Apr-18	47.6	1,609.8	5.04	170.4
Jul-18	33.1	1,104.2	4.02	134.1
Oct-18	51.9	1554.35	4.04	120.9937

2015 Weekly Effluent TN (mg/L)	6.83	**2015 Weekly Effluent TN (lb/day)**	161
		2016 Monthly Influent	882
		2016Monthly Effluent	122
		2017-18 Monthly Influent	1301
		2017-18 Monthly Effluent	128

	Total Nitrogen		
	Influent (mg/L)	**Effluent (mg/L)**	**% Removal (%)**
7/26/2015	52	6.1	88.3
8/2/2015	54.2	5.14	90.5
8/9/2015	59.7	5.96	90.0
8/16/2015	59.5	6.26	89.5
8/23/2015	37.4	5.64	84.9
9/1/2015	33.3	4.99	85.0
9/7/2015	52.6	4.83	90.8
9/13/2015	41.8	4.73	88.7
9/20/2015	28.5	5.46	80.8
9/27/2015	31.5	4.99	84.2
10/4/2015	28.9	4.42	84.7
10/11/2015	37.9	4.92	87.0
10/18/2015	33.1	5.22	84.2
10/25/2015	34.4	6.46	81.2
11/1/2015	22.2	7.65	65.5
11/8/2015	55.4	8.26	85.1
11/15/2015	31.7	8.42	73.4
11/22/2015	35.9	7.48	79.2
12/1/2015	33.2	10.43	68.6
12/6/2015	30.6	7.29	76.2
12/14/2015	26.2	6.11	76.7
12/21/2015	30.3	6.46	78.7
12/28/2015	29.3	5.52	81.2

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Total Phosphorus Data

Monthly Influent TP (lb/day)	118
Monthly Effluent TP (lb/day)	47.85

	Total Phosphorus		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
10/1/2014	4.04	3.2	20.8
10/5/2014	4.03	3.55	11.9
10/12/2014	3.94	0.66	83.2
10/19/2014	3.82	1.08	71.7
10/26/2014	3.74	0.83	77.8
11/2/2014	3.85	1.29	66.5
11/9/2014	3.73	1.59	57.4
11/16/2014	3.73	1.51	59.5
11/23/2014	3.56	1.18	66.9
12/7/2014	4	1.14	71.5
12/14/2014	3.03	1.45	52.1
12/21/2014	2.61	1.07	59.0
12/28/2014	3.44	2.41	29.9
1/4/2015	3.26	2.82	13.5
1/11/2015	3.69	1.92	48.0
1/19/2015	3.89	1.89	51.4
2/25/2015	3.05	1.48	51.5
2/1/2015	4.31	2.29	46.9
2/8/2015	3.65	2.47	32.3
2/15/2015	3.87	2.2	43.2
2/22/2015	2.76	2.55	7.6
3/1/2015	3.91	2.25	42.5
3/8/2015	3.76	2.32	38.3
3/15/2015	4.45	1.89	57.5
3/22/2015	4	1.9	52.5
4/1/2015	4.75	2.78	41.5
4/5/2015	3.9	2.53	35.1
4/12/2015	4.53	1.68	62.9
4/19/2015	4.58	1.68	63.3
4/26/2015	4.08	1.86	54.4
5/3/2015	4.56	1.59	65.1
5/10/2015	4.06	1.29	68.2
5/17/2015	2.58	1.53	40.7
5/25/2015	3.86	1.49	61.4
6/1/2015	3.61	1.79	50.4
6/7/2015	3.27	3.43	-4.9
6/14/2015	4.35	2.66	38.9
6/21/2015	4.49	2.79	37.9
7/1/2015	5.62	2.12	62.3
7/5/2015	3.38	2.28	32.5
7/12/2015	4.64	1.51	67.5
7/19/2015	5.06	1.41	72.1
7/26/2015	4.61	2.48	46.2

	Monthly Effluent (mg/L)	Weekly Effluent (mg/L)
Oct-14	1.86	3.55
Nov-14	1.39	1.59
Dec-14	1.49	2.41
Jan-15	2.03	2.82
Feb-15	2.38	2.55
Mar-15	2.09	2.32
Apr-15	2.11	2.78
May-15	1.48	1.59
Jun-15	2.67	3.43
Jul-15	1.96	2.48
Aug-15	1.89	2.07
Sep-15	2.1	2.47
Oct-15	2.76	3.31
Nov-15	3.64	4.2
Dec-15	3.35	4.1

	Inf (mg/L)	Inf (lb/day)	Eff (mg/L)	Eff (lb/day)
Jan-16	5.21	136	4.01	104.7
Apr-16	2.54	70	2.09	57.6
Jul-16	4.52	114	0.79	19.9
Oct-16			0.48	13.9
Jan-17	4.72	131	1.16	32.3
Apr-17	4.92	141	1.06	30.4
Jul-17	4.88	128	2.43	63.7
Oct-17	4.29	117	0.5	13.7
Jan-18	4.56	122	1.78	47.8
Apr-18	2.92	99	0.83	28.1
Jul-18	4.15	138	1.85	61.7
Oct-18	3.45	103	1.5	44.9

	lb/day	lb/day
Oct-14	44.28	83.85
Nov-14	33.01	38.2
Dec-14	35.65	53.96
Jan-15	52.44	67.4
Feb-15	62.86	79.05
Mar-15	50.09	55.53
Apr-15	48.5	63.12
May-15	34.51	38.78
Jun-15	62.37	80.25
Jul-15	44.25	53.84

	Total Phosphorus		
	Influent (mg/L)	Effluent (mg/L)	% Removal (%)
8/2/2015	4.13	1.5	63.7
8/9/2015	3.24	2	38.3
8/16/2015	4.5	2	55.6
8/23/2015	4.25	2.07	51.3
9/1/2015	4.91	1.79	63.5
9/7/2015	3.9	1.58	59.5
9/13/2015	4.99	2.39	52.1
9/20/2015	5.11	2.47	51.7
9/27/2015	5.67	2.27	60.0
10/4/2015	6.05	2.3	62.0
10/11/2015	5.6	3.31	40.9
10/18/2015	5.76	2.61	54.7
10/25/2015	5.45	2.82	48.3
11/1/2015	6.7	2.16	67.8
11/8/2015	5.01	4.13	17.6
11/15/2015	6.32	4.2	33.5
11/22/2015	5.62	4.08	27.4

Aug-15	42.62	46.45
Sep-15	50.23	57.57
Oct-15	63.4	74.44
Nov-15	79.59	93.2
Dec-15	69.51	82.91

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
TKN and Nitrate+Nitrite Data

	TKN		N+N	
	Influent (mg/L)	Effluent (mg/L)	Influent (mg/L)	Effluent (mg/L)
10/1/2014	49.7	1.78	0.91	6.32
10/5/2014	20.9	0.32	0.19	4.77
10/12/2014	40.4	2.65	0.34	3.53
10/19/2014	38.1	1.91	1.28	3.02
10/26/2014	55.8	1.77	1.02	4.54
11/2/2014	52.2	3.76	1.1	4.59
11/9/2014	46.3	1.8	0.13	2.76
11/16/2014	47.5	2.14	0.1	2.36
11/23/2014	24.9	1.64	0.65	2.53
12/1/2014	44.8	2.32	0.66	1.93
12/7/2014	27.5	2.35	1.1	3.41
12/14/2014	10.3	0.72	0.2	1.94
12/21/2014	37	1.97	0.38	3.91
12/28/2014	27.1	1.66	0.68	3.25
1/4/2015	34.3	2.2	1.03	3.74
1/11/2015	30.2	1.77	0.96	1.67
1/19/2015	23.7	1.54	0.56	2.78
2/25/2015	27.2	0.96	0.19	2.62
2/1/2015	24	2.35	0.31	3.48
2/8/2015	25.5	2.74	0.43	4.03
2/15/2015	46.6	3.32	0.08	4.91
2/22/2015	29	1.42	0.63	3.06
3/1/2015	45.3	2.57	0.38	2.88
3/8/2015	29.4	2.46	0.31	3.15
3/15/2015	43.3	2.3	0.78	3.75
3/22/2015	49.5	3.04	0.65	3.73
4/1/2015	28.9	1.6	2.25	5.29
4/5/2015	29.6	1.22	0.46	3.82
4/12/2015	45.8	1.85	0.32	2.95
4/19/2015	50.2	2.08	0.14	3.15
4/26/2015	28.4	1.47	0.4	3.42
5/3/2015	18.5	0.97	0.45	2.79
5/10/2015	20.8	<0.25	0.15	2.79
5/17/2015	39.5	1.1	0.62	2.8
5/25/2015	22.8	0.54	1.57	3.91
6/1/2015	48.3	1.14	0.61	5.34
6/7/2015	45.7	1.92	1.44	4.05
6/14/2015	35.3	1.97	0.31	3.54
6/21/2015	39.6	1.29	0.65	3.75
7/1/2015	48.7	1.78	1.28	4.37
7/5/2015	43	1.64	0.39	3.07
7/12/2015	40.4	2.1	0.24	2.84
7/19/2015	53.6	0.67	0.31	4.19
7/26/2015	51.7	1.81	0.35	4.29
8/2/2015	53.9	1.98	0.32	3.16
8/9/2015	59.5	3.06	0.18	2.9
8/16/2015	59	2.05	0.46	4.21
8/23/2015	37.2	1.47	0.2	4.17
9/1/2015	33.1	1.75	0.25	3.24
9/7/2015	52.4	1.24	0.14	3.59
9/13/2015	41.7	2.07	0.12	2.66
9/20/2015	28.2	1.45	0.33	4.01
9/27/2015	31.1	1	0.48	3.99
10/4/2015	28.8	0.75	0.11	3.67
10/11/2015	37.6	1	0.34	3.92
10/18/2015	32.6	1.1	0.56	4.12
10/25/2015	33.6	0.97	0.84	5.49
11/1/2015	21.8	1.53	0.34	6.12
11/8/2015	55.4	1.88	0.01	6.38
11/15/2015	31.7	1.84	0.03	6.58
11/22/2015	35.8	1.2	0.04	6.28
12/1/2015	33.2	2.09	<0.01	8.34
12/6/2015	30.4	1.46	0.17	5.83
12/14/2015	26.1	1.22	0.1	4.89
12/21/2015	30.1	1.89	0.18	4.57
12/28/2015	29.3	1.59	<0.01	3.39

	TKN		N+N	
	Inf (mg/L)	Eff (mg/L)	Inf (mg/L)	Eff (mg/L)
Jan-16				
Apr-16				
Jul-16				
Oct-16				
Jan-17	46.4	1.14	<0.01	2.9
Apr-17	63.6	3.9	<0.01	2.94
Jul-17	34	0.85	<0.01	3.67
Oct-17	76.3	0.96	<0.01	3.04
Jan-18	44.9	2.21	<0.012	2.95
Apr-18	47.3	2.61	<0.01	2.43
Jul-18	33.1	1.29	<0.01	2.73
Oct-18	51.9	1.01	<0.01	3.03

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Copper Data

Monthly Influent Copper (mg/L)	**0.088**
Monthly Effluent Copper (mg/L)	**0.009**

Date	Influent Copper (mg/L)	Effluent Copper (mg/L)
10/1/2014	0.221	0.002
11/2/2014	0.108	0.013
12/7/2014	0.144	0.028
1/4/2015	0.057	0.0005
2/1/2015	0.048	0.009
3/1/2015	0.046	0.002
4/1/2015	0.059	0.007
5/3/2015	0.064	0.018
6/7/2015	0.080	0.027
7/5/2015	0.115	0.013
8/9/2015	0.094	0.008
9/1/2015	0.105	0.006
10/4/2015	0.142	0.01
11/1/2015	0.043	0.009
12/2/2015	0.101	0.01
1/3/2016	0.138	0.005
4/3/2016	0.106	0.002
7/4/2016	0.101	0.009
10/3/2016	0.084	0.008
1/2/2017	0.068	0.006
4/2/2017	0.030	0.0005
7/9/2017	0.151	0.029
10/1/2017	0.052	0.012
1/1/2018	0.050	0.001
4/2/2018	0.043	0.004
7/8/2018	0.050	0.001
10/1/2018	0.066	0.01

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Zinc Data

Monthly Influent Zinc (mg/L)	**0.158**
Monthly Effluent Zinc (mg/L)	**0.081**

	Influent (mg/L)	Effluent (mg/L)
10/1/2014	0.131	0.049
11/2/2014	0.141	0.073
12/7/2014	0.122	0.059
1/4/2015	0.122	0.054
2/1/2015	0.148	0.079
3/1/2015	0.141	0.071
4/1/2015	0.172	0.066
5/3/2015	0.126	0.1
6/7/2015	0.160	0.095
7/5/2015	0.210	0.087
8/9/2015	0.203	0.086
9/1/2015	0.192	0.072
10/4/2015	0.228	0.098
11/1/2015	0.112	0.074
12/2/2015	0.189	0.085
1/3/2016	0.178	0.096
4/3/2016	0.199	0.106
7/4/2016	0.171	0.103
10/3/2016	0.115	0.065
1/2/2017	0.138	0.072
4/2/2017	0.113	0.077
7/9/2017	0.153	0.104
10/1/2017	0.136	0.102
1/1/2018	0.180	0.073
4/2/2018	0.118	0.069
7/8/2018	0.240	0.084
10/1/2018	0.141	0.085

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City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Cyanide and Phenols Data

	Influent		Effluent		
	Cyanide	Phenols	cyanide	phenols	oil/grease
10/1/2014	<0.0500	<0.1000	<0.0500	<0.1000	<1.00
11/2/2014	<5.0000	<10.0000	<5.0000	<10.0000	-
12/7/2014	<5.0000	<10.0000	-	-	-
1/4/2015	<0.0500	0.12	<0.0500	<0.1000	<1.00
2/1/2015	<0.1000	<0.0100	<0.1000	<0.0100	-
3/1/2015	<5.0000	<10.0000	<5.0000	<10.0000	-
4/1/2015	<5.0000	<10.0000	<5.0000	<10.0000	<1.00
5/3/2015	<5.0000	<10.0000	<5.0000	<10.0000	-
6/7/2015	<5.0000	<10.0000	<5.0000	<10.0000	-
7/5/2015	<5.0000	<10.0000	<5.0000	<10.0000	<1.00
8/9/2015	<5.0000	<10.0000	<5.0000	<10.0000	-
9/1/2015	<5.0000	<10.0000	<5.0000	<10.0000	-
10/4/2015	<5.0000	<10.0000	<5.0000	<10.0000	-
11/1/2015	<5.0000	<10.0000	<5.0000	<10.0000	-

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City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Influent Metals

Raw Metals Data

Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	0.064	<0.003	0.006	<0.001	0.00014	0.001	0.001	<0.001	0.221	0.0034	0.001	0.002	<0.0100	0.003	<0.0002	<0.0002	0.131
11/2/2014	0.068	<0.003	0.012	<0.001	0.00011	0.003	0.003	<0.001	0.108	0.0555	<0.00001	0.009	<0.0100	0.002	<0.0002	<0.0002	0.141
12/7/2014	0.137	<0.003	0.007	<0.001	<0.00008	0.005	0.005	<0.001	0.144	0.0045	0.00005	0.009	0.014	0.004	<0.0002	<0.0002	0.122
1/4/2015	0.049	<0.003	0.006	<0.001	0.00022	0.002	0.002	<0.001	0.057	0.0014	<0.00001	0.009	<0.0100	0.002	<0.0002	<0.0002	0.122
2/1/2015	0.082	<0.003	0.005	<0.001	0.00014	0.002	0.002	<0.001	0.048	0.007	<0.00001	0.007	0.012	0.004	<0.0002	<0.0002	0.148
3/1/2015	0.082	<0.003	0.004	<0.001	0.0001	0.002	0.002	<0.001	0.046	0.0036	<0.00001	0.006	0.011	0.002	<0.0002	<0.0002	0.141
4/1/2015	0.066	<0.003	0.003	<0.001	0.00011	0.002	0.002	<0.001	0.059	0.0038	<0.00001	0.009	0.016	0.002	<0.0002	<0.0002	0.172
5/3/2015	0.078	<0.003	0.003	<0.001	0.00032	0.003	<0.00100	0.003	0.064	0.0034	<0.00001	<0.0010	<0.0100	<0.001	<0.0002	<0.0002	0.126
6/7/2015	0.125	<0.003	0.004	<0.001	0.00032	0.005	<0.00100	0.005	0.080	0.0028	0.00012	<0.0010	0.011	0.001	<0.0002	<0.0002	0.160
7/5/2015	0.114	<0.003	0.005	<0.001	0.0003	0.002	0.002	<0.001	0.115	0.0007	0.00002	<0.0010	<0.0100	0.007	<0.0002	<0.0002	0.210
8/9/2015	0.082	<0.003	0.006	<0.001	0.0007	0.002	0.002	<0.001	0.094	0.0072	0.00003	0.008	<0.0100	0.003	<0.0002	<0.0002	0.203
9/1/2015	0.123	<0.003	0.005	<0.001	<0.00008	0.003	0.003	<0.001	0.105	0.0075	0.00003	0.012	<0.0100	0.002	<0.0002	<0.0002	0.192
10/4/2015	0.144	<0.003	0.006	<0.001	<0.00008	0.005	0.005	<0.001	0.142	0.0073	<0.00001	0.004	0.007	0.001	<0.0002	<0.0002	0.228
11/1/2015	0.037	<0.003	0.006	<0.001	<0.00008	0.003	0.003	<0.001	0.043	0.0018	<0.00001	0.007	<0.0100	<0.001	<0.0002	<0.0002	0.112
12/2/2015	0.11	<0.003	0.004	<0.001	0.00021	0.001	0.001	<0.001	0.101	0.0027	<0.00001	0.003	0.004	<0.001	<0.0002	<0.0002	0.189
1/3/2016	0.081	<0.003	0.005	<0.001	0.000222	0.003	0.003	<0.001	0.138	0.0025	<0.00001	0.006	0.01	0.001	<0.0005	<0.0002	0.178
4/3/2016	0.081	<0.003	0.004	<0.001	0.00027	0.002	0.002	<0.001	0.108	0.0027	0.0002	0.007	0.01	0.002	<0.0005	<0.0002	0.199
7/4/2016	0.031	<0.003	0.007	<0.001	<0.00008	0.003	0.003	<0.001	0.101	0.0026	0.00005	0.008	0.006	<0.001	<0.0002	<0.0002	0.171
10/3/2016	0.053	<0.003	0.004	<0.001	0.00016	0.002	0.002	<0.001	0.084	0.0032	<0.00001	0.006	<0.0100	0.001	<0.0002	<0.0002	0.115
1/2/2017	0.051	<0.003	0.004	<0.001	<0.00008	0.002	0.002	<0.001	0.068	0.0018	0.00003	0.005	<0.0100	0.004	<0.0002	<0.0002	0.138
4/2/2017	0.048	<0.003	0.004	<0.001	0.00022	0.002	0.002	<0.001	0.030	0.0033	<0.00001	0.002	<0.0100	<0.001	<0.0002	<0.0002	0.113
7/9/2017	0.04	<0.003	0.004	<0.001	0.00018	<0.001	<0.001	<0.001	0.151	0.0029	<0.00001	0.007	<0.0100	0.003	<0.0002	<0.0002	0.153
10/1/2017	0.057	0.001	0.004	<0.0008	0.00018	0.007	0.007	<0.001	0.052	0.005	0.000007	0.006	0.016	<0.001	<0.0002	<0.0002	0.136
1/1/2018	0.012	0.0007	0.004	<0.0008	<0.00003	<0.001	<0.001	<0.001	0.050	0.0047	0.00008	0.006	0.006	<0.001	<0.0002	<0.0002	0.180
4/2/2018	0.41	<0.0005	0.006	<0.0008	<0.00003	<0.001	<0.001	<0.002	0.043	0.002	<0.000005	0.004	0.004	0.002	<0.0002	<0.0002	0.118
7/8/2018	0.016	0.0006	0.007	<0.0008	<0.00003	<0.001	<0.003	0.005	0.050	0.0025	0.00005	0.005	0.004	<0.001	<0.0002	<0.0002	0.240
10/1/2018	0.055	0.0005	0.006	<0.0008	0.00008	<0.001	<0.003	<0.002	0.066	0.0046	0.00002	0.006	0.036	0.003	<0.0002	<0.0002	0.141

Analyzed Metals Data

Non-detect results assigned half the detection limit, except mercury = 1/3 the detection limit.

Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	0.064	0.0015	0.006	0.0005	0.00014	0.001	0.001	0.0005	0.295	0.0034	0.001	0.002	0.005	0.003	0.0001	0.0001	0.131
11/2/2014	0.068	0.0015	0.012	0.0005	0.00011	0.003	0.003	0.0005	0.108	0.0555	0.00000125	0.009	0.005	0.002	0.0001	0.0001	0.141
12/7/2014	0.137	0.0015	0.007	0.0005	0.00004	0.005	0.005	0.0005	0.144	0.0045	0.00005	0.009	0.014	0.004	0.0001	0.0001	0.122
1/4/2015	0.049	0.0015	0.006	0.0005	0.00022	0.002	0.002	0.0005	0.057	0.0014	0.00000125	0.009	0.005	0.002	0.0001	0.0001	0.122
2/1/2015	0.082	0.0015	0.005	0.0005	0.00014	0.002	0.002	0.0005	0.048	0.0070	0.00000125	0.007	0.012	0.004	0.0001	0.0001	0.148
3/1/2015	0.082	0.0015	0.004	0.0005	0.0001	0.002	0.002	0.0005	0.046	0.0036	0.00000125	0.006	0.011	0.002	0.0001	0.0001	0.141
4/1/2015	0.066	0.0015	0.003	0.0005	0.00011	0.002	0.002	0.0005	0.059	0.0038	0.00000125	0.009	0.016	0.002	0.0001	0.0001	0.172
5/3/2015	0.078	0.0015	0.003	0.0005	0.00032	0.003	0.0005	0.003	0.064	0.0034	0.00000125	0.0005	0.005	0.0005	0.0001	0.0001	0.126
6/7/2015	0.125	0.0015	0.004	0.0005	0.00032	0.005	0.0005	0.005	0.080	0.0028	0.00012	0.0005	0.011	0.001	0.0001	0.0001	0.160
7/5/2015	0.114	0.0015	0.005	0.0005	0.0003	0.002	0.002	0.0005	0.115	0.0007	0.00002	0.0005	0.005	0.007	0.0001	0.0001	0.210
8/9/2015	0.082	0.0015	0.006	0.0005	0.0007	0.002	0.002	0.0005	0.094	0.0072	0.00003	0.008	0.005	0.003	0.0001	0.0001	0.203
9/1/2015	0.123	0.0015	0.005	0.0005	0.00004	0.003	0.003	0.0005	0.105	0.0075	0.00003	0.012	0.005	0.002	0.0001	0.0001	0.192
10/4/2015	0.144	0.0015	0.006	0.0005	0.00004	0.005	0.005	0.0005	0.142	0.0073	0.00000125	0.004	0.007	0.001	0.0001	0.0001	0.228
11/1/2015	0.037	0.0015	0.006	0.0005	0.00004	0.003	0.003	0.0005	0.043	0.0018	0.00000125	0.007	0.005	0.0005	0.0001	0.0001	0.112
12/2/2015	0.11	0.0015	0.004	0.0005	0.00021	0.001	0.001	0.0005	0.101	0.0027	0.00000125	0.003	0.004	0.0005	0.0001	0.0001	0.189
1/3/2016	0.081	0.0015	0.005	0.0005	0.000222	0.003	0.003	0.0005	0.138	0.0025	0.00000125	0.006	0.01	0.001	0.0001	0.0001	0.178
4/3/2016	0.081	0.0015	0.004	0.0005	0.00027	0.002	0.002	0.0005	0.108	0.0027	0.0002	0.007	0.01	0.002	0.0001	0.0001	0.199
7/4/2016	0.031	0.0015	0.007	0.0005	0.00004	0.003	0.003	0.0005	0.101	0.0026	0.00005	0.008	0.006	0.0005	0.0001	0.0001	0.171
10/3/2016	0.053	0.0015	0.004	0.0005	0.00016	0.002	0.002	0.0005	0.084	0.0032	0.00000125	0.006	0.005	0.001	0.0001	0.0001	0.115
1/2/2017	0.051	0.0015	0.004	0.0005	0.00004	0.002	0.002	0.0005	0.068	0.0018	0.00003	0.005	0.005	0.004	0.0001	0.0001	0.138
4/2/2017	0.048	0.0015	0.004	0.0005	0.00022	0.002	0.002	0.0005	0.030	0.0033	0.00000125	0.002	0.005	0.0005	0.0001	0.0001	0.113
7/9/2017	0.04	0.0015	0.004	0.0005	0.00018	0.0005	0.0005	0.0005	0.151	0.0029	0.00000125	0.007	0.005	0.003	0.0001	0.0001	0.153
10/1/2017	0.057	0.001	0.004	0.0004	0.00018	0.007	0.007	0.0005	0.052	0.0050	0.000007	0.006	0.016	0.0005	0.0001	0.0001	0.136
1/1/2018	0.012	0.0007	0.004	0.0004	0.00015	0.0005	0.0005	0.0005	0.050	0.0047	0.00008	0.006	0.006	0.0005	0.0001	0.0001	0.180
4/2/2018	0.41	0.00025	0.006	0.0004	0.00015	0.0005	0.0005	0.001	0.043	0.0020	0.000000625	0.004	0.004	0.002	0.0001	0.0001	0.118
7/8/2018	0.016	0.0006	0.007	0.0004	0.00015	0.0005	0.0015	0.005	0.050	0.0025	0.00005	0.005	0.004	0.0005	0.0001	0.0001	0.240
10/1/2018	0.055	0.0005	0.006	0.0004	0.00008	0.0005	0.0015	0.001	0.066	0.0046	0.00002	0.006	0.036	0.003	0.0001	0.0001	0.141
2016 average	**0.091**	**0.0015**	**0.005**	**0.0005**	**0.00019**	**0.003**	**0.002**	**0.001**	**0.100**	**0.0075**	**0.00008408**	**0.006**	**0.008**	**0.0023**	**0.0001**	**0.0001**	**0.160**
2014-2018 average	**0.085**	**0.001**	**0.005**	**0.000**	**0.00016**	**0.0024**	**0.0022**	**0.0010**	**0.090**	**0.006**	**0.000063**	**0.0057**	**0.0084**	**0.0020**	**0.00010**	**0.000**	**0.158**
2016-2018 average	**0.078**	**0.001**	**0.005**	**0.000**	**0.00012**	**0.002**	**0.002**	**0.001**	**0.078**	**0.003**	**0.000**	**0.006**	**0.009**	**0.0015**	**0.00010**	**0.000**	**0.157**

	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
2016 average	**0.091**	**0.0015**	**0.005**	**0.0005**	**0.00019**	**0.003**	**0.002**	**0.001**	**0.100**	**0.0075**	**0.00008408**	**0.006**	**0.008**	**0.0023**	**0.0001**	**0.0001**	**0.160**
2014-2018 average	**0.085**	**0.001**	**0.005**	**0.000**	**0.00016**	**0.0024**	**0.0022**	**0.0010**	**0.090**	**0.006**	**0.000063**	**0.0057**	**0.0084**	**0.0020**	**0.00010**	**0.000**	**0.158**
2016-2018 average	**0.078**	**0.001**	**0.005**	**0.000**	**0.00012**	**0.002**	**0.002**	**0.001**	**0.078**	**0.003**	**0.000**	**0.006**	**0.009**	**0.0015**	**0.00010**	**0.000**	**0.157**

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
WWTP Effluent Metals

Raw Metals Data

Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	<0.030	<0.003	0.005	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.002	<0.0005	<0.00001	0.001	<0.010	0.003	<0.0002	<0.0002	0.049
11/2/2014	<0.030	<0.003	0.004	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.013	<0.0005	<0.00001	0.008	<0.010	0.002	<0.0002	<0.0002	0.073
12/7/2014	<0.030	<0.003	0.004	<0.001	<0.00008	0.003	0.003	<0.0010	0.028	<0.0005	0.00004	0.009	0.01	0.004	<0.0002	<0.0002	0.059
1/4/2015	<0.030	<0.003	0.004	<0.001	<0.00008	<0.001	<0.0010	<0.0010	<0.00100	<0.0005	<0.00001	0.005	<0.010	<0.001	<0.0002	<0.0002	0.054
2/1/2015	<0.030	<0.003	0.005	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.009	0.0005	<0.00001	0.007	<0.010	0.003	<0.0002	<0.0002	0.079
3/1/2015	<0.030	<0.003	0.004	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.002	<0.0005	<0.00001	0.006	0.009	0.001	<0.0002	<0.0002	0.071
4/1/2015	<0.030	<0.003	<0.003	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.007	<0.0005	<0.00001	0.006	0.018	0.004	<0.0002	<0.0002	0.066
5/3/2015	<0.030	<0.003	0.003	<0.001	0.00019	0.002	0.002	<0.0010	0.018	0.0012	<0.00001	<0.001	<0.010	<0.001	<0.0002	<0.0002	0.1
6/7/2015	<0.030	<0.003	0.004	<0.001	0.00018	0.003	0.003	<0.0010	0.027	0.0005	0.00003	<0.001	<0.010	0.001	<0.0002	<0.0002	0.095
7/5/2015	<0.030	<0.003	<0.003	<0.001	0.00066	<0.001	<0.0010	<0.0010	0.013	<0.0005	<0.00001	<0.001	<0.010	<0.001	<0.0002	<0.0002	0.087
8/9/2015	<0.030	<0.003	0.005	<0.001	0.0007	<0.001	<0.0010	<0.0010	0.008	0.0008	0.00001	0.009	>0.010	0.002	<0.0002	<0.0002	0.086
9/1/2015	<0.030	<0.003	0.004	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.006	<0.0005	<0.00001	0.008	<0.010	0.002	<0.0002	<0.0002	0.072
10/4/2015	<0.030	<0.003	0.004	<0.001	<0.00008	0.002	0.002	<0.0010	0.01	0.0005	<0.00001	0.004	0.004	<0.001	<0.0002	<0.0002	0.098
11/1/2015	<0.030	<0.003	0.004	<0.001	<0.00008	0.002	0.002	<0.0010	0.009	0.0007	<0.00001	0.006	<0.010	<0.001	<0.0002	<0.0002	0.074
12/1/2015	<0.030	<0.003	0.004	<0.001	<0.00008	<0.001	<0.001	<0.001	0.01	<0.0005	<0.00001	0.001	0.002	<0.001	<0.0002	<0.0002	0.085
1/3/2016	<0.030	<0.003	0.004	<0.001	<0.00008	0.001	0.002	<0.0010	0.005	<0.0005	<0.00001	<0.001	<0.010	<0.001	<0.0002	<0.0002	0.096
4/3/2016	<0.030	<0.003	0.003	<0.001	0.00012	<0.001	<0.0010	<0.0010	0.002	0.0008	0.00002	0.006	<0.010	0.002	<0.0002	<0.0002	0.106
7/4/2016	<0.030	<0.003	0.004	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.009	0.0009	0.00003	0.006	0.009	<0.001	<0.0002	<0.0002	0.103
10/3/2016	<0.030	<0.003	0.003	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.008	0.0006	<0.00001	0.007	<0.010	<0.001	<0.0002	<0.0002	0.065
1/2/2017	<0.030	<0.003	0.003	<0.001	<0.00008	<0.001	<0.0010	<0.0010	0.006	<0.0005	<0.00001	0.003	<0.010	<0.001	<0.0002	<0.0002	0.072
4/2/2017	<0.030	<0.003	0.003	<0.001	<0.00008	0.002	0.002	<0.0010	<0.001	0.001	<0.00001	<0.001	<0.010	<0.001	<0.0002	<0.0002	0.077
7/9/2017	<0.030	<0.003	0.004	<0.001	0.00018	<0.001	<0.0010	<0.0010	0.029	0.0008	<0.00001	0.007	<0.010	0.003	<0.0002	<0.0002	0.104
10/1/2017	0.015	0.0005	0.004	<0.0008	0.00005	0.002	0.002	<0.0010	0.012	0.0005	<0.00001	0.006	0.016	<0.001	<0.0002	<0.0002	0.102
1/1/2018	0.013	0.0006	0.004	<0.0008	<0.00003	<0.001	<0.0020	<0.0010	<0.002	<0.0003	<0.00001	0.003	<0.002	<0.001	<0.0002	<0.0002	0.073
4/2/2018	0.008	<0.00050	0.005	<0.0008	<0.00003	<0.001	<0.0010	<0.0010	0.004	0.0005	0.00008	0.004	0.003	0.002	<0.0002	<0.0002	0.069
7/8/2018	<0.009	0.0005	0.006	<0.0008	<0.00003	<0.001	<0.003	<0.002	<0.002	0.0006	0.00004	0.003	0.002	<0.001	<0.0002	<0.0002	0.084
10/1/2018	0.009	0.0005	0.006	<0.0008	<0.00003	<0.001	<0.003	<0.002	0.01	0.0003	<0.000005	0.007	0.004	0.003	<0.0002	<0.0002	0.085

Analyzed Metals Data

Non-detect results assigned half the detection limit, except mercury = 1/8 the detection limit

Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	0.015	0.0015	0.005	0.0005	0.00004	0.0005	0.0005	0.0005	0.002	0.00025	0.00000125	0.001	0.005	0.003	0.0001	0.0001	0.049
11/2/2014	0.015	0.0015	0.004	0.0005	0.00004	0.0005	0.0005	0.0005	0.013	0.00025	0.00000125	0.008	0.005	0.002	0.0001	0.0001	0.073
12/7/2014	0.015	0.0015	0.004	0.0005	0.00004	0.003	0.003	0.0005	0.028	0.00025	0.00004	0.009	0.01	0.004	0.0001	0.0001	0.059
1/4/2015	0.015	0.0015	0.004	0.0005	0.00004	0.0005	0.0005	0.0005	0.0005	0.00025	0.00000125	0.005	0.005	0.0005	0.0001	0.0001	0.054
2/1/2015	0.015	0.0015	0.005	0.0005	0.00004	0.0005	0.0005	0.0005	0.009	0.0005	0.00000125	0.007	0.005	0.003	0.0001	0.0001	0.079
3/1/2015	0.015	0.0015	0.004	0.0005	0.00004	0.0005	0.0005	0.0005	0.002	0.00025	0.00000125	0.006	0.009	0.001	0.0001	0.0001	0.071
4/1/2015	0.015	0.0015	0.0015	0.0005	0.00004	0.0005	0.0005	0.0005	0.007	0.00025	0.00000125	0.006	0.018	0.004	0.0001	0.0001	0.066
5/3/2015	0.015	0.0015	0.003	0.0005	0.00019	0.002	0.002	0.0005	0.018	0.0012	0.00000125	0.0005	0.005	0.0005	0.0001	0.0001	0.1
6/7/2015	0.015	0.0015	0.004	0.0005	0.00018	0.003	0.003	0.0005	0.027	0.0005	0.00003	0.0005	0.005	0.001	0.0001	0.0001	0.095
7/5/2015	0.015	0.0015	0.0015	0.0005	0.00066	0.0005	0.0005	0.0005	0.013	0.00025	0.00000125	0.0005	0.005	0.0005	0.0001	0.0001	0.087
8/9/2015	0.015	0.0015	0.005	0.0005	0.0007	0.0005	0.0005	0.0005	0.008	0.0008	0.00001	0.009	0.005	0.002	0.0001	0.0001	0.086
9/1/2015	0.015	0.0015	0.004	0.0005	0.00004	0.0005	0.0005	0.0005	0.006	0.00025	0.00000125	0.008	0.005	0.002	0.0001	0.0001	0.072
10/4/2015	0.015	0.0015	0.004	0.0005	0.00004	0.002	0.002	0.0005	0.01	0.0005	0.00000125	0.004	0.004	0.0005	0.0001	0.0001	0.098
11/1/2015	0.015	0.0015	0.004	0.0005	0.00004	0.002	0.002	0.0005	0.009	0.0007	0.00000125	0.006	0.005	0.0005	0.0001	0.0001	0.074
12/1/2015	0.015	0.0015	0.004	0.0005	0.00004	0.0005	0.0005	0.0005	0.01	0.00025	0.00000125	0.001	0.002	0.0005	0.0001	0.0001	0.085
1/3/2016	0.015	0.0015	0.004	0.0005	0.00004	0.001	0.002	0.0005	0.005	0.00025	0.00000125	0.0005	0.005	0.0005	0.0001	0.0001	0.096
4/3/2016	0.015	0.0015	0.003	0.0005	0.00012	0.0005	0.0005	0.0005	0.002	0.0008	0.00002	0.006	0.005	0.002	0.0001	0.0001	0.106
7/4/2016	0.015	0.0015	0.004	0.0005	0.00004	0.0005	0.0005	0.0005	0.009	0.0009	0.00003	0.006	0.009	0.0005	0.0001	0.0001	0.103
10/3/2016	0.015	0.0015	0.003	0.0005	0.00004	0.0005	0.0005	0.0005	0.008	0.0006	0.00000125	0.007	0.005	0.0005	0.0001	0.0001	0.065
1/2/2017	0.015	0.0015	0.003	0.0005	0.00004	0.0005	0.0005	0.0005	0.006	0.00025	0.00000125	0.003	0.005	0.0005	0.0001	0.0001	0.072
4/2/2017	0.015	0.0015	0.003	0.0005	0.00004	0.002	0.002	0.0005	0.0005	0.001	0.00000125	0.0005	0.005	0.0005	0.0001	0.0001	0.077
7/9/2017	0.015	0.0015	0.004	0.0005	0.00018	0.0005	0.0005	0.0005	0.029	0.0008	0.00000125	0.007	0.005	0.003	0.0001	0.0001	0.104
10/1/2017	0.015	0.0005	0.004	0.0004	0.00005	0.002	0.002	0.0005	0.012	0.0005	0.00000125	0.006	0.016	0.0005	0.0001	0.0001	0.102
1/1/2018	0.013	0.0006	0.004	0.0004	0.000015	0.0005	0.001	0.0005	0.001	0.00015	0.00000125	0.003	0.001	0.0005	0.0001	0.0001	0.073
4/2/2018	0.008	<0.00050	0.005	0.0004	0.000015	0.0005	0.0005	0.0005	0.004	0.0005	0.00008	0.004	0.003	0.002	0.0001	0.0001	0.069
7/8/2018	0.0045	0.0005	0.006	0.0004	0.000015	0.0005	0.0015	0.001	0.001	0.0006	0.00004	0.003	0.002	0.0005	0.0001	0.0001	0.084
10/1/2018	0.009	0.0005	0.006	0.0004	0.000015	0.0005	0.0015	0.001	0.01	0.0003	0.000000625	0.007	0.004	0.003	0.0001	0.0001	0.085
2016 average	**0.015**	**0.0015**	**0.004**	**0.0005**	**0.00014**	**0.001**	**0.0011**	**0.0005**	**0.011**	**0.00043**	**0.00000633**	**0.0048**	**0.006**	**0.0017**	**0.0001**	**0.0001**	**0.077**
2014-2018 average	**0.014**	**0.001**	**0.004**	**0.0005**	**0.00010**	**0.0010**	**0.0011**	**0.0005**	**0.009**	**0.00049**	**0.0000102**	**0.0046**	**0.006**	**0.001**	**0.000**	**0.000**	**0.081**
2016-2018 average	**0.013**	**0.001**	**0.004**	**0.0005**	**0.000**	**0.001**	**0.001**	**0.001**	**0.007**	**0.001**	**0.000015**	**0.004**	**0.005**	**0.001**	**0.000**	**0.000**	**0.086**

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Prickly Pear Creek (Receiving Stream)

Raw Data									
Date	Hardness as CaCO3 (mg/L)	Total Phosphorus (mg/L)	Nitrate + Nitrite as N (mg/L)	TKN (mg/L)	Total Nitrogen (mg/L)	Total Ammonia as N (mg/L)	Total Cyanide (mg/L)	Total Phenols (mg/L)	ph
10/1/2014	112	<.01	0.12	0.53	0.65	0.16	<.05	<.1	8.03
1/3/2015	127	0.02	0.2	0.62	0.82	0.11	<.05	<.1	7.8
4/1/2015	106	0.03	0.09	0.53	0.62	0.12	<5	<10	7.96
7/4/2015	90	0.05	0.11	0.41	0.52	<.1	<5	<10	8
10/3/2015	114	Not Sampled	0.48	0.21	0.69	Not Sampled	<5	<10	7.99
1/18/2017	135	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
4/10/2017	105	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
7/17/2017	97	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
10/17/2017	105	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
1/19/2018	107	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
4/11/2018	134	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled

90th Percentile Calc		75th Percentile Calc
Hardness as CaCO3 (mg/L)		
90	**Index**	120.5
97	9.9	105
105		
105		
106		
107		
112		
114		
127		
134		
135		

Raw Data																	
Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	<.03	<.003	0.006	<.001	<.00008	<.001	<.001	<.001	<.001	<.0005	<.00001	0.001	<.01	0.003	<.0005	<.0002	0.05
1/3/2015	<.03	<.003	0.005	<.001	<.00009	<.001	<.001	<.001	<.001	<.0005	<.00001	0.008	<.01	0.001	<.0005	<.0002	0.055
4/1/2015	0.089	<.003	0.003	<.001	0.00049	<.001	<.001	<.001	<.001	0.0045	0.00006	0.009	0.007	0.001	<.0005	<.0002	0.05
7/4/2015	0.034	<.003	0.006	<.001	0.00081	<.001	<.001	<.001	0.008	0.0122	<.00001	<.001	<.01	<.001	<.0005	<.0002	0.081
10/3/2015	0.08	<.003	0.01	<.001	<.00008	0.002	0.002	<.01	0.041	0.0414	<.00001	0.005	0.004	<.001	<.0005	<.0002	0.172

Analyzed Data																	
Non-detect results assigned half the detection limit, except mercury = 1/8 the detection limit																	
Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	0.015	0.0015	0.006	0.0005	0.00004	0.0005	0.0005	0.0005	0.0005	0.00025	1.25E-06	0.001	0.005	0.003	0.00025	0.0001	0.05
1/3/2015	0.015	0.0015	0.005	0.0005	0.00004	0.0005	0.0005	0.0005	0.0005	0.00025	1.25E-06	0.008	0.005	0.001	0.00025	0.0001	0.055
4/1/2015	0.089	0.0015	0.003	0.0005	0.00049	0.0005	0.0005	0.0005	0.0005	0.0045	0.00006	0.009	0.007	0.001	0.00025	0.0001	0.05
7/4/2015	0.034	0.0015	0.006	0.0005	0.00081	0.0005	0.0005	0.0005	0.008	0.0122	1.25E-06	0.0005	0.005	0.0005	0.00025	0.0001	0.081
10/3/2015	0.08	0.0015	0.010	0.0005	0.00004	0.002	0.002	0.0005	0.041	0.0414	1.25E-06	0.005	0.004	0.0005	0.00025	0.0001	0.172
average	**0.047**	**0.0015**	**0.006**	**0.0005**	**0.00028**	**0.0008**	**0.0008**	**0.0005**	**0.010**	**0.01172**	**0.0000130**	**0.0047**	**0.005**	**0.0012**	**0.00025**	**0.0001**	**0.082**

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Trucked/Hauled Waste

Raw Data			
Date	Hardness as CaCO3 (mg/L)	Total Cyanide (mg/L)	Total Phenols (mg/L)
10/1/2014	1395	67.8	6.7
11/2/2014	1020	340	10.8
12/7/2014	Not Sampled	<5	<10
1/4/15	418	<.05	0.27
2/2/2015	2102	8.46	2.46
3/2/15	923	56	<10
4/1/2015	811	5.21	<10
5/2/2015	339	<5	<10
6/7/2015	461	31.3	<10
7/4/2015	305	<5	<10
8/8/2015	825	<5	25.2
9/1/2015	1061	58.9	15.6
10/3/2015	563	5.84	<10
11/1/2015	621	37.8	20.6
12/1/2015	526	6.3	<10

Raw Data		
Date	ph	Oil & Grease (mg/L)
10/1/2014	7.83	100
1/4/15	6.65	55
4/1/2015	8.4	18
7/4/2015	9.1	9
10/3/2015	9.03	383

Month	Flow (Gallons)	Month	Flow (Gallons)
Jan-14	53,220	Jan-15	75,175
Feb-14	73,095	Feb-15	55,000
Mar-14	119,375	Mar-15	140,760
Apr-14	67,625	Apr-15	144,525
May-14	141,755	May-15	164,480
Jun-14	128,680	Jun-15	177,710
Jul-14	164,800	Jul-15	165,225
Aug-14	136,790	Aug-15	135,535
Sep-14	176,860	Sep-15	140,150
Oct-14	193,895	Oct-15	168,543
Nov-14	105,315	Nov-15	77,730
Dec-14	46,465	Dec-15	94,150

Total	1,407,875	Total	1,538,983	
Average	122,786	gal/month	0.00409	MGD

Raw Metals Data

Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	0.607	0.008	0.16	<.001	0.00875	0.09	0.09	<.01	5.278	0.1853	0.0033	0.217	0.134	0.018	0.0083	0.0004	10.27
11/2/2014	1.63	0.003	0.046	<.001	0.0106	0.1	0.1	<.01	2.28	0.1081	<.00001	0.026	0.125	0.045	<.0005	<.0002	10.56
12/7/2014	1.136	0.004	0.031	<.001	<.00008	0.105	0.105	<.01	0.879	0.035	0.00153	0.149	0.083	0.034	<.0002	2.45	1184
1/4/15	0.908	0.004	0.07	0.002	<.00008	0.039	0.039	<.01	1.505	0.15	0.00026	0.097	0.03	0.007	0.006	0.0003	3
2/2/2015	1.916	0.006	0.044	<.001	<.00008	0.181	0.181	<.01	3.807	0.116	0.00008	0.338	0.205	0.022	0.0054	0.0003	7.652
3/2/15	0.556	0.011	0.053	<.001	<.00008	0.134	0.134	<.01	4.471	0.18	0.00165	0.216	0.185	0.041	0.0065	0.0006	8.828
4/1/2015	0.727	0.007	0.068	<.001	<.00008	0.063	0.063	<.01	2.51	0.0626	0.00078	0.223	0.198	0.057	0.0118	0.0007	5.91
5/2/2015	0.247	<.003	0.004	<.001	0.0008	0.015	0.015	<.01	0.092	0.0074	<.00001	<.001	0.015	<.001	<.0005	<.0002	0.746
6/7/2015	2.401	<.003	0.096	<.001	0.00125	0.063	0.063	<.01	0.534	0.0251	0.00878	<.001	0.146	0.026	<.0005	<.0002	5.583
7/4/2015	0.27	<.003	0.005	0.003	0.0022	0.007	0.007	<.01	0.022	0.0155	0.00013	<.001	0.017	0.004	0.012	<.0002	0.71
8/8/2015	0.727	<.003	0.031	<.001	0.00382	0.023	<.001	0.023	0.29	0.0328	0.00068	0.046	0.015	0.033	<.0005	<.0002	2.946
9/1/2015	0.633	0.011	0.065	<.001	0.002	0.073	0.073	<.01	2.808	0.0913	0.00006	0.122	0.073	0.016	<.0005	<.0002	9.698
10/3/2015	0.762	<.003	0.023	<.001	0.0007	0.078	0.078	<.01	0.646	0.0261	<.00001	0.047	0.066	0.078	0.0016	<.0002	0.65
11/1/2015	0.636	<.003	0.089	<.001	0.0003	0.06	0.06	<.01	0.249	0.0115	0.00009	0.036	0.053	0.024	<.0005	<.0002	2.05
12/1/2015	0.341	<.004	0.04	<.002	0.0031	0.043	0.043	<.01	1.324	0.064	0.0005	0.091	0.05	0.002	<.0005	<.0002	5.198

Analyzed Metals Data

Non-detect results assigned half the detection limit, except mercury = 1/8 the detection limit

Date	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)
10/1/2014	0.607	0.008	0.16	0.0005	0.00875	0.09	0.09	0.005	5.278	0.1853	0.0033	0.217	0.134	0.018	0.0083	0.0004	10.27
11/2/2014	1.63	0.003	0.046	0.0005	0.0106	0.1	0.1	0.005	2.28	0.1081	0.00000125	0.026	0.125	0.045	0.00025	0.0001	10.56
12/7/2014	1.136	0.004	0.031	0.0005	0.00004	0.105	0.105	0.005	0.879	0.035	0.00153	0.149	0.083	0.034	0.00025	2.45	11.84
1/4/15	0.908	0.004	0.07	0.002	0.00004	0.039	0.039	0.005	1.505	0.15	0.00026	0.097	0.03	0.007	0.006	0.0003	3
2/2/2015	1.916	0.006	0.044	0.0005	0.00004	0.181	0.181	0.005	3.807	0.116	0.00008	0.338	0.205	0.022	0.0054	0.0003	7.652
3/2/15	0.556	0.011	0.053	0.0005	0.00004	0.134	0.134	0.005	4.471	0.18	0.00165	0.216	0.185	0.041	0.0065	0.0006	8.828
4/1/2015	0.727	0.007	0.068	0.0005	0.00004	0.063	0.063	0.005	2.51	0.0626	0.00078	0.223	0.198	0.057	0.0118	0.0007	5.91
5/2/2015	0.247	0.0015	0.004	0.0005	0.0008	0.015	0.015	0.005	0.092	0.0074	0.00000125	0.0005	0.015	0.0005	0.00025	0.0001	0.746
6/7/2015	2.401	0.0015	0.096	0.0005	0.00125	0.063	0.063	0.005	0.534	0.0251	0.00878	0.0005	0.146	0.026	0.00025	0.0001	5.583
7/4/2015	0.27	0.0015	0.005	0.003	0.0022	0.007	0.007	0.005	0.022	0.0155	0.00013	0.0005	0.017	0.004	0.012	0.0001	0.71
8/8/2015	0.727	0.0015	0.031	0.0005	0.00382	0.023	0.0005	0.023	0.29	0.0328	0.00068	0.046	0.015	0.033	0.00025	0.0001	2.946
9/1/2015	0.633	0.011	0.065	0.0005	0.002	0.073	0.073	0.005	2.808	0.0913	0.00006	0.122	0.073	0.016	0.00025	0.0001	9.698
10/3/2015	0.762	0.0015	0.023	0.0005	0.0007	0.078	0.078	0.005	0.646	0.0261	0.00000125	0.047	0.066	0.078	0.0016	0.0001	0.65
11/1/2015	0.636	0.0015	0.089	0.0005	0.0003	0.06	0.06	0.005	0.249	0.0115	0.00009	0.036	0.053	0.024	0.00025	0.0001	2.05
12/1/2015	0.341	0.0015	0.04	0.0005	0.0031	0.043	0.043	0.005	1.324	0.064	0.0005	0.091	0.05	0.002	0.00025	0.0001	5.198
Average lb/day	**0.900**	**0.0043**	**0.055**	**0.0008**	**0.0022**	**0.072**	**0.070**	**0.0062**	**1.780**	**0.0740**	**0.00118958**	**0.1073**	**0.093**	**0.027**	**0.0036**	**0.1635**	**5.7094**

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City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
SIU

Flow Records Decorative Industrial Plating							
2014		2015				Average	
3rd Quarter (gallons)	4th Quarter (gallons)	1st Quarter (gallons)	2nd Quarter (gallons)	3rd Quarter (gallons)	4th Quarter (gallons)	Ave/Quarter	Ave/Month
13,550	11,129	13,441	10,230	9,400	9,760	11,252	3,751

Total SIU Flow

DIP Ave/Month	MRL Ave/Month	MGD
3,751	7,757	0.000383592

Montana Rail Link														
Oct 2014 (gallons)	Nov 2014 (gallons)	Dec 2014 (gallons)	Jan 2015 (gallons)	Feb 2015 (gallons)	Mar 2015 (gallons)	Apr 2015 (gallons)	May 2015 (gallons)	Jun 2015 (gallons)	Jul 2015 (gallons)	Aug 2015 (gallons)	Sept 2015 (gallons)	Oct 2015 (gallons)	Nov 2015 (gallons)	Dec 2015 (gallons)
0	12,580	12,580	12,580	0	12,580	0	12,580	11,544	10,084	8,535	10,780	12,515	0	0

Decorative Industrial Plating Raw Data														
Date	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
9/24/2014	0.002	0.001	0.019	0.019	<0.001	0.123	0.006	<0.0006	0.003	0.104	<0.001	<0.001	0.259	<0.005
Oct-14	0.003	0.0077	0.02	0.02	<0.001	0.655	0.022	<0.0006	0.005	0.111	0.002	<0.001	0.769	<0.005
3/31/2015	0.001	0.005	0.041	0.024	0.017	1.066	0.019	<0.0006	0.006	0.204	0.004	<0.001	0.52	<0.005
6/23/2015	0.002	0.003	0.009	<0.001	0.009	0.145	0.005	<0.0006	<0.001	0.131	<0.001	<0.001	0.122	<0.005
9/30/2015	0.003	0.013	0.022	0.022	<0.001	0.131	0.026	<0.0006	0.007	0.134	0.012	<0.001	0.63	<0.005
12/29/2015	0.003	<0.001	0.047	0.027	0.02	0.114	0.001	<0.0006	<0.001	0.059	0.001	<0.001	0.325	<0.005

Decorative Industrial Painting Analyzed Data														
Non-detect results assigned half the detection limit, except mercury = 1/8 the detection limit														
Date	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
9/24/2014	0.002	0.001	0.019	0.019	0.0005	0.123	0.006	0.000075	0.003	0.104	0.0005	0.0005	0.259	<0.005
Oct-14	0.003	0.0077	0.02	0.02	0.0005	0.655	0.022	0.000075	0.005	0.111	0.002	0.0005	0.769	<0.005
3/31/2015	0.001	0.005	0.041	0.024	0.017	1.066	0.019	0.000075	0.006	0.204	0.004	0.0005	0.52	<0.005
6/23/2015	0.002	0.003	0.009	0.0005	0.009	0.145	0.005	0.000075	0.0005	0.131	0.0005	0.0005	0.122	<0.005
9/30/2015	0.003	0.013	0.022	0.022	0.0005	0.131	0.026	0.000075	0.007	0.134	0.012	0.0005	0.63	<0.005
12/29/2015	0.003	0.0005	0.047	0.027	0.02	0.114	0.001	0.000075	0.0005	0.059	0.001	0.0005	0.325	<0.005
Average	**0.002**	**0.0050**	**0.026**	**0.019**	**0.0079**	**0.372**	**0.013**	**0.000075**	**0.0037**	**0.124**	**0.003**	**0.0005**	**0.438**	**#DIV/0!**

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
March 16, 2021 Revisions Per EPA Review Comments
Domestic Pollutant Characterization

Raw Data

Date	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
3/29/2016	0.003	0.00016	0.001	0.001	<0.001	0.071	0.002	<0.00001	0.012	0.011	0.003	<0.0005	0.113	<5
4/4/2016	0.003	0.00026	0.002	0.002	<0.001	0.093	0.0027	0.00002	0.007	0.012	0.002	<0.0005	0.201	<5
4/11/2016	0.004	0.00028	0.002	0.002	<0.001	0.065	0.0015	<0.00001	0.007	0.006	0.002	<0.0005	0.099	<5
11/4/2020	0.011	0.0009	0.005	<0.003	<0.002	0.118	0.025	0.00001	0.008	0.015	<0.001	<0.0002	0.326	2.93
1/13/2021	0.004	0.0008	<0.010	<0.003	<0.002	0.168	0.013	0.00005	<0.001	0.010	<0.001	<0.0002	0.340	0.25

Analyzed Data

Non-detect results assigned half the detection limit, except mercury = 1/8 the detection limit

Date	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
3/29/2016	0.003	0.00016	0.001	0.001	0.0005	0.071	0.002	0.00000125	0.012	0.011	0.003	0.00025	0.113	2.5
4/4/2016	0.003	0.00026	0.002	0.002	0.0005	0.093	0.0027	0.00002	0.007	0.012	0.002	0.00025	0.201	2.5
4/11/2016	0.004	0.00028	0.002	0.002	0.0005	0.065	0.0015	0.00000125	0.007	0.006	0.002	0.00025	0.099	2.5
11/4/2020	0.011	0.0009	0.005	0.0015	0.001	0.118	0.025	0.00001	0.008	0.015	0.0005	0.0001	0.326	2.93
1/13/2021	0.004	0.0008	0.005	0.0015	0.001	0.168	0.013	0.00005	0.0005	0.010	0.0005	0.0001	0.340	0.25
Average	0.005	0.0006	0.003	0.002	0.001	0.103	0.009	0.00002	0.007	0.011	0.002	0.0002	0.216	2.1360

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
March 16, 2021 Revisions Per EPA Review Comments
Commercial Pollutant Characterization

Raw Data

Date	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
1/7/2016	0.006	0.00023	0.005	0.005	<0.001	0.087	0.0034	0.00005	0.002	0.008	0.002	<0.0005	0.28	<5
2/25/2016	0.005	0.00023	0.002	0.002	<0.001	0.04	0.0017	<0.00001	0.008	<0.010	0.005	0.001	0.121	<5
3/29/2016	0.005	0.00025	0.003	0.003	<0.001	0.104	0.0033	<0.00001	0.015	0.013	0.003	<0.0005	0.25	<5
11/4/2020	0.016	0.0003	0.001	<0.003	<0.002	0.034	0.003	0.00001	0.006	0.016	<0.001	<0.0002	0.048	0.009
1/13/2021	0.008	0.0010	<0.010	<0.003	<0.002	0.032	0.002	0.00002	0.002	0.009	<0.001	<0.0002	0.061	0.021

Analyzed Data

Non-detect results assigned half the detection limit, except mercury = 1/8 the detection limit

Date	Arsenic (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Chrom-III (mg/L)	Chrom-VI (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
1/7/2016	0.006	0.00023	0.005	0.005	0.0005	0.087	0.0034	0.00005	0.002	0.008	0.002	0.00025	0.28	2.5
2/25/2016	0.005	0.00023	0.002	0.002	0.0005	0.04	0.0017	0.00000125	0.008	0.005	0.005	0.001	0.121	2.5
3/29/2016	0.005	0.00025	0.003	0.003	0.0005	0.104	0.0033	0.00000125	0.015	0.013	0.003	0.00025	0.25	2.5
11/4/2020	0.016	0.0003	0.001	0.0015	0.001	0.034	0.003	0.00001	0.006	0.016	0.0005	0.0001	0.048	0.009
1/13/2021	0.008	0.0010	0.005	0.0015	0.001	0.032	0.002	0.00002	0.002	0.009	0.0005	0.0001	0.061	0.021
Average	0.008	0.0004	0.003	0.003	0.001	0.059	0.003	0.00002	0.007	0.010	0.002	0.0003	0.152	1.5060

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Biosolids Sampling

Raw Data

Denotes a cell where the value was less than (<) the reported number

Parameter	4/7/2014	10/1/2014	1/4/2015	4/1/2015	7/5/2015	10/4/2015	1/2/2017	4/2/2017	7/9/2017	10/2/2017	1/4/2018	4/3/2018	7/10/2018	10/2/2018	Average
Aluminum (mg/kg)								1.6	6.47	3.77	4.41	15.52	6.47	6.43	
Antimony (mg/kg)	0.17	1.58	1.15	1.27	0.648	0.556	1.24	0.3	1.29	1.23	0.99	0.74	1.29	0.85	0.95
Arsenic (mg/kg)	9.14	9.74	8.65	8.2	8.99	11.31	9.35	6.45	9.8	8.46	6.78	10.14	9.8	9.96	9.06
Beryllium (mg/kg)	0.06	0.06	0.2	0.06	0.06	0.16	0.07	0.07	0.07	0.23	0.19	0.21	0.07	0.24	0.13
Cadmium (mg/kg)	0.004	1.6	1.3	0.14	1.72	1.63	1.72	1.26	1.33	1.35	1.08	1.7	1.33	1.86	1.29
Chromium (mg/kg)	6	11.5	10.3	14.2	13.6	18.9	9.1	5.6	16.1	15.8	12.7	10.3	16.1	14.3	12.5
Chrom-III (mg/kg)	6	11.5	10.3	14.2	13.6	18.9	9.1	5.6	16.1	15.8	12.7	10.3	16.1	14.3	12.5
Chrom-VI (mg/kg)	0.63	0.63	0.63	0.63	0.63	0.51	0.66	0.66	0.66	0.66	1.23	1.223	0.66	1.23	0.76
Copper (mg/kg)	448	659	831	613	626	688	599	178	664	648	519	316	664	499	568
Lead (mg/kg)	35.4	32.2	30.5	28.7	33.5	36.8	18.4	17.8	27.7	22.1	17.7	18.8	27.7	30.8	27.0
Mercury (mg/kg)	0.57	0.54	0.51	0.54	0.53	0.76	0.46	0.02	0.67	0.71	0.57	0.43	0.67	0.95	0.57
Molybdenum (mg/kg)	6.5	18.2	16.6	13.2	8	11.6	9.8	2.6	11.7	12.3	9.9	4.9	11.7	9.9	10.5
Nickel (mg/kg)	60.3	20.4	31.8	34.1	22.1	33.1	17.9	12.7	24.4	28.5	22.8	14.5	24.4	19	26.1
Selenium (mg/kg)	0.06	3.63	1.42	3.44	2.19	5.81	2.35	0.3	3.14	4.2	3.37	3.14	3.14	5.42	2.97
Silver (mg/kg)	1.81	2.89	2.16	3.96	2	1.97	1.25	0.02	2.05	1.82	1.46	0.83	2.05	1.76	2.47
Thallium (mg/kg)	0.01	0.09	0.09	0.11	0.03	0.06	0.01	0.01	0.01	0.01	0.01	0.06	0.01	9	0.679286
Zinc (mg/kg)	576	569	606	646	628	724	664	382	612	609	489	457	612	617	585
Ammonia (mg/kg)	45283	152105	92230	31376	17699	61389	43595	30850	97712	81481	98911	41857	58562	48062	64365
TKN (mg/kg)	79143	160368	125203	57302	88051	82374	79869	144900	72941	137963	105297	45190	72941	88502	95717
Nitrate/Nitrite as N (mg/kg)	191	163	138	268	32	78	34	28	81	2	0.01	0.01	81	4.63	79
Total Nitrogen (mg/kg)	79334	160531	125341	57570	88083	82452	79903	144928	73022	137965	105297	45190	73022	88507	95796
Total Phosphorus (mg/kg)	22667	20789	27027	19788	14818	19798	25229	2478	24444	25617	174752	1580095	24444	3586	141824

% Solids	2.1	1.9	1.5	1.9	2.5	2	1.5	2	1.5	1.6	2	2	1.5	2.3	1.9

City of Helena WWTP
Pretreatment Program Detailed Local Limits Reevaluation January 2019
Removal Efficiency Calculations

In accordance with EPA Region 8 Local Limits Development Appendix L

Whenever an influent sample is zero (or was reported as below the detection level and assigned a value of zero), a DRE cannot be calculated regardless of the effluent value. Therefore, influent/effluent data pairs for which the influent level is zero must be removed from the data set before calculating removal efficiencies using the ADRE approach and the decile approach. However, the POTW can use these data in calculating a removal efficiency using the MRE method since the MRE method does not involve the calculation of individual DREs from each pair of influent and effluent values. - Appendix L Page 115 last paragraph

DRE Method	ARSENIC	CADMIUM	CHROMIUM	CHROM-III	CHROM-VI	COPPER	LEAD	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	ZINC
10/1/2014	16.7%	71.4%	50.0%	50.0%		99.3%	92.6%	99.9%	50.0%		0.0%		62.6%
11/2/2014	66.7%	63.6%	83.3%	83.3%		88.0%	99.5%		11.1%		0.0%		48.2%
12/7/2014	42.9%	0.0%	40.0%	40.0%		80.6%	94.4%	20.0%	0.0%	28.6%	0.0%		51.6%
1/4/2015	33.3%	81.8%	75.0%	75.0%		99.1%	82.1%		44.4%		75.0%		55.7%
2/1/2015	0.0%	71.4%	75.0%	75.0%		81.3%	92.9%		0.0%	58.3%	25.0%		46.6%
3/1/2015	0.0%	60.0%	75.0%	75.0%		95.7%	93.1%		0.0%	18.2%	50.0%		49.6%
4/1/2015	50.0%	63.6%	75.0%	75.0%		88.1%	93.4%		33.3%	-12.5%	-100.0%		61.6%
5/3/2015	0.0%	40.6%	33.3%		83.3%	71.9%	64.7%						20.6%
6/7/2015	0.0%	43.8%	40.0%		90.0%	66.3%	82.1%	75.0%			0.0%		40.6%
7/5/2015	70.0%	-120.0%	75.0%	75.0%		88.7%	64.3%	93.8%			92.9%		58.6%
8/9/2015	16.7%	0.0%	75.0%	75.0%		91.5%	88.9%	66.7%	-12.5%		33.3%		57.6%
9/1/2015	20.0%		83.3%	83.3%		94.3%	96.7%	95.8%	33.3%		0.0%		62.5%
10/4/2015	33.3%		60.0%	60.0%		93.0%	93.2%		0.0%	42.9%	50.0%		57.0%
11/1/2015	33.3%	0.0%	33.3%	33.3%		79.1%	61.1%		14.3%				33.9%
12/2/2015	0.0%		50.0%	50.0%		90.1%	90.7%		66.7%	50.0%			55.0%
1/3/2016	20.0%	82.0%	66.7%	33.3%		96.4%	90.0%		91.7%	50.0%	50.0%		46.1%
4/3/2016	25.0%	55.6%	75.0%	75.0%		98.1%	70.4%	90.0%	14.3%	50.0%	0.0%		46.7%
7/4/2016	42.9%		83.3%	83.3%		91.1%	65.4%	40.0%	25.0%	-50.0%			39.8%
10/3/2016	25.0%	75.0%	75.0%	75.0%		90.5%	81.3%		-16.7%		50.0%		43.5%
1/2/2017	25.0%		75.0%	75.0%		91.2%	86.1%	95.8%	40.0%		87.5%		47.8%
4/2/2017	25.0%		0.0%	0.0%		98.3%	69.7%		75.0%				31.9%
7/9/2017	0.0%	0.0%				80.8%	72.4%		0.0%		0.0%		32.0%
10/1/2017	0.0%	72.2%	71.4%	71.4%		76.9%	90.0%	82.1%	0.0%	0.0%			25.0%
1/1/2018	0.0%					98.0%	96.8%	98.4%	50.0%	83.3%			59.4%
4/2/2018	16.7%					90.7%	75.0%		0.0%	25.0%	0.0%		41.5%
7/8/2018	14.3%				80.0%	98.0%	76.0%	20.0%	40.0%	50.0%			65.0%
10/1/2018	0.0%	81.3%				84.8%	93.5%	96.9%	-16.7%	88.9%	0.0%		39.7%
ADRE Method	21.4%	41.2%	62.3%	63.2%	84.4%	88.9%	83.6%	75.0%	22.6%	34.5%	21.8%		47.4%
MRE Method	24.8%	34.8%	58.9%	49.6%	44.2%	89.8%	91.3%	83.9%	19.4%	30.4%	26.4%	0.0%	49.0%
DECILE Method	20.00%	61.82%	75.00%	75.00%	NA	90.70%	88.89%	90.00%	14.29%	46.43%	0.00%	NA	47.83%
1	0.0%	-120.0%	0.00%	0.0%	1	66.3%	61.11%	20.0%	-16.67%	-50.00%	-100.0%		20.6%	1
2	0.0%	0.0%	33.3%	33.3%	2	71.9%	64.29%	20.00%	-16.67%	-12.50%	0.0%		25.0%	2
3	0.0%	0.0%	33.33%	33.3%	3	76.92%	64.71%	40.0%	-12.5%	0.00%	0.0%		31.9%	3
4	0.0%	0.0%	40.0%	40.0%	4	79.1%	65.38%	66.67%	0.0%	18.18%	0.0%		32.0%	4
5	0.0%	0.0%	40.0%	50.0%	5	80.6%	69.7%	75.00%	0.0%	25.00%	0.00%		33.9%	5
6	0.0%	40.6%	50.00%	50.0%	6	81.3%	70.37%	82.1%	0.00%	28.57%	0.00%		39.7%	6
7	0.0%	43.8%	50.00%	60.0%	7	80.79%	72.4%	90.0%	0.00%	42.86%	0.00%		39.8%	7
8	0.0%	55.6%	60.0%	71.4%	8	84.85%	75.0%	93.75%	0.00%	50.00%	0.00%		40.6%	8
9	0.0%	60.0%	66.67%	75.0%	9	88.0%	76.0%	95.8%	0.0%	50.00%	0.00%		41.5%	9
10	14.3%	63.6%	71.43%	75.0%	10	88.1%	81.25%	95.8%	0.0%	50.00%	0.00%		43.5%	10
11	16.7%	63.6%	75.0%	75.0%	11	88.7%	82.14%	96.9%	11.1%	50.00%	25.0%		46.1%	11
12	16.7%	71.4%	75.0%	75.0%	12	90.1%	82.14%	98.4%	14.29%	58.30%	33.3%		46.6%	12
13	16.7%	71.4%	75.0%	75.0%	13	90.48%	86.1%	99.88%	14.3%	83.33%	50.0%		46.7%	13
14	20.0%	72.2%	75.0%	75.0%	14	90.70%	88.89%		25.00%	88.89%	50.00%		47.8%	14
15	20.0%	75.0%	75.0%	75.0%	15	91.09%	90.0%		33.3%		50.00%		48.2%	15
16	25.0%	81.3%	75.0%	75.0%	16	91.18%	90.00%		33.3%		50.0%		49.6%	16
17	25.0%	81.8%	75.00%	75.0%	17	91.5%	90.74%		40.00%		75.0%		51.6%	17
18	25.0%	82.0%	75.00%	83.3%	18	93.0%	92.65%		40.00%		87.50%		55.0%	18
19	25.0%		75.00%	83.3%	19	94.3%	92.86%		44.4%		92.90%		55.7%	19
20	33.3%		83.3%	83.3%	20	95.7%	93.06%		50.0%				57.0%	20
21	33.3%		83.3%		21	96.36%	93.15%		50.00%				57.6%	21
22	33.3%		83.33%		22	98.00%	93.42%		66.7%				58.6%	22
23	42.9%				23	98.00%	93.5%		75.00%				59.4%	23
24	42.9%				24	98.11%	94.44%		91.67%				61.6%	24
25	50.0%				25	98.33%	96.67%						62.5%	25
26	66.7%				26	99.10%	96.8%						62.6%	26
27	70.0%				27	99.3%	99.55%						65.0%	27

Decile	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Arsenic								
First Decile	2.8	2	0.0%	0.0%	0.0%	0.8	0.00%	0.00%
2nd	5.6	5	0.0%	0.0%	0.0%	0.6	0.00%	0.00%
3rd	8.4	8	0.0%	0.0%	0.0%	0.4	0.00%	0.00%
4th	11.2	11	16.7%	16.7%	0.0%	0.2	0.00%	16.67%
5th	14	14	20.0%	20.0%	0.0%	0	0.00%	20.00%
6th	16.8	16	25.0%	25.0%	0.0%	0.8	0.00%	25.00%
7th	19.6	19	25.0%	33.3%	8.3%	0.6	5.00%	30.00%
8th	22.4	22	33.3%	42.9%	9.5%	0.4	3.81%	37.14%
9th	25.2	25	50.0%	66.7%	16.7%	0.2	3.33%	53.33%
Cadmium								
First Decile	1.9	1	-120.0%	0.0%	120.0%	0.9	108.00%	-12.0%
2nd	3.8	3	0.0%	0.0%	0.0%	0.8	0.00%	0.00%
3rd	5.7	5	0.0%	40.6%	40.6%	0.7	28.44%	28.4375%
4th	7.6	7	43.8%	55.6%	11.8%	0.6	7.08%	50.83%
5th	9.5	9	60.0%	63.6%	3.6%	0.5	1.82%	61.82%
6th	11.4	11	63.6%	71.4%	7.8%	0.4	3.12%	66.75%

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7th	13.3	12	71.4%	71.4%	0.0%	0.3	0.00%	71.43%
8th	15.2	14	72.2%	75.0%	2.8%	0.2	0.56%	72.78%
9th	17.1	16	81.3%	81.8%	0.6%	0.1	0.06%	81.31%
Chromium								
First Decile	2.3	2	33.3%	33.3%	0.0%	0.3	0.00%	33.33%
2nd	4.6	4	40.0%	40.0%	0.0%	0.6	0.00%	40.00%
3rd	6.9	6	50.0%	50.0%	0.0%	0.9	0.00%	50.00%
4th	9.2	9	66.7%	71.4%	4.8%	0.2	0.95%	67.62%
5th	11.5	11	75.0%	75.0%	0.0%	0.5	0.00%	75.00%
6th	13.8	13	75.0%	40.0%	-35.0%	0.8	-28.00%	47.00%
7th	16.1	16	75.0%	75.0%	0.0%	0.1	0.00%	75.00%
8th	18.4	18	75.0%	75.0%	0.0%	0.4	0.00%	75.00%
9th	20.7	20	83.3%	83.3%	0.0%	0.7	0.00%	83.33%
Chromium-III								
First Decile	2.1	2	33.3%	33.3%	0.0%	0.1	0.00%	33.33%
2nd	4.2	4	40.0%	50.0%	10.0%	0.2	2.00%	42.00%
3rd	6.3	6	50.0%	60.0%	10.0%	0.3	3.00%	53.00%
4th	8.4	8	71.4%	75.0%	3.6%	0.4	1.43%	72.86%
5th	10.5	10	75.0%	75.0%	0.0%	0.5	0.00%	75.00%
6th	12.6	12	75.0%	75.0%	0.0%	0.6	0.00%	75.00%
7th	14.7	14	75.0%	75.0%	0.0%	0.7	0.00%	75.00%
8th	16.8	16	75.0%	75.0%	0.0%	0.8	0.00%	75.00%
9th	18.9	18	83.3%	83.3%	0.0%	0.9	0.00%	83.33%
Copper								
First Decile	2.8	2	71.9%	76.9%	5.0%	0.8	4.04%	75.91%
2nd	5.6	5	80.6%	81.3%	0.7%	0.6	0.42%	80.97%
3rd	8.4	8	84.8%	88.0%	3.1%	0.4	1.25%	86.09%
4th	11.2	11	88.7%	90.1%	1.4%	0.2	0.28%	88.98%
5th	14	14	90.7%	91.1%	0.4%	0	0.00%	90.70%
6th	16.8	16	91.2%	91.5%	0.3%	0.8	0.25%	91.43%
7th	19.6	19	94.3%	95.7%	1.4%	0.6	0.82%	95.11%
8th	22.4	22	98.0%	98.0%	0.0%	0.4	0.00%	98.00%
9th	25.2	25	98.3%	99.1%	0.8%	0.2	0.15%	98.49%
Lead								
First Decile	2.8	2	64.3%	64.7%	0.4%	0.8	0.34%	64.62%
2nd	5.6	5	69.7%	70.4%	0.7%	0.6	0.40%	70.10%
3rd	8.4	8	75.0%	76.0%	1.0%	0.4	0.40%	75.40%
4th	11.2	11	82.1%	82.1%	0.0%	0.2	0.00%	82.14%
5th	14	14	88.9%	90.0%	1.1%	0	0.00%	88.89%
6th	16.8	16	90.0%	90.7%	0.7%	0.8	0.59%	90.59%
7th	19.6	19	92.9%	93.1%	0.2%	0.6	0.12%	92.98%
8th	22.4	22	93.4%	93.5%	0.1%	0.4	0.02%	93.44%
9th	25.2	25	96.7%	96.8%	0.1%	0.2	0.03%	96.70%
Mercury								
First Decile	1.4	1	20.0%	20.0%	0.0%	0.4	0.00%	20.00%
2nd	2.8	2	20.0%	40.0%	20.0%	0.8	16.00%	36.00%
3rd	4.2	4	66.7%	75.0%	8.3%	0.2	1.67%	68.33%
4th	5.6	5	75.0%	82.1%	7.1%	0.6	4.29%	79.29%
5th	7	7	90.0%	93.8%	3.8%	0	0.00%	90.00%
6th	8.4	8	93.8%	95.8%	2.1%	0.4	0.83%	94.58%
7th	9.8	9	95.8%	95.8%	0.0%	0.8	0.00%	95.83%
8th	11.2	11	96.9%	98.4%	1.6%	0.2	0.31%	97.19%
9th	12.6	12	98.4%	99.9%	1.4%	0.6	0.86%	99.30%
Molybdenum								
First Decile	2.5	2	-16.7%	-12.5%	4.2%	0.5	2.08%	-14.58%
2nd	5	5	0.0%	0.0%	0.0%	0	0.00%	0.00%
3rd	7.5	7	0.0%	0.0%	0.0%	0.5	0.00%	0.00%
4th	10	10	0.0%	11.1%	11.1%	0	0.00%	0.00%
5th	12.5	12	14.3%	14.3%	0.0%	0.5	0.00%	14.29%
6th	15	15	33.3%	33.3%	0.0%	0	0.00%	33.33%
7th	17.5	17	40.0%	40.0%	0.0%	0.5	0.00%	40.00%
8th	20	20	50.0%	50.0%	0.0%	0	0.00%	50.00%
9th	22.5	22	66.7%	75.0%	8.3%	0.5	4.17%	70.83%
Nickel								
First Decile	1.5	1	-50.0%	-12.5%	37.5%	0.5	18.75%	-31.25%
2nd	3	3	0.0%	18.2%	18.2%	0	0.00%	0.00%
3rd	4.5	4	18.2%	25.0%	6.8%	0.5	3.41%	21.59%
4th	6	6	28.6%	42.9%	14.3%	0	0.00%	28.57%
5th	7.5	7	42.9%	50.0%	7.1%	0.5	3.57%	46.43%
6th	9	9	50.0%	50.0%	0.0%	0	0.00%	50.00%
7th	10.5	10	50.0%	50.0%	0.0%	0.5	0.00%	50.00%
8th	12	12	58.3%	83.3%	25.0%	0	0.00%	58.30%
9th	13.5	13	83.3%	88.9%	5.6%	0.5	2.78%	86.11%
Selenium								
First Decile	2	2	0.0%	0.0%	0.0%	0	0.00%	0.00%
2nd	4	4	0.0%	0.0%	0.0%	0	0.00%	0.00%
3rd	6	6	0.0%	0.0%	0.0%	0	0.00%	0.00%
4th	8	8	0.0%	0.0%	0.0%	0	0.00%	0.00%
5th	10	10	0.0%	25.0%	25.0%	0	0.00%	0.00%
6th	12	12	33.3%	50.0%	16.7%	0	0.00%	33.33%
7th	14	14	50.00%	50.0%	0.0%	0	0.00%	50.00%
8th	16	16	50.0%	87.5%	37.5%	0	0.00%	50.00%
9th	18	18	87.50%	92.90%	5.4%	0	0.00%	87.50%
Zinc								
First Decile	2.8	2	25.0%	31.9%	6.9%	0.8	5.49%	30.49%
2nd	5.6	5	33.9%	39.7%	5.8%	0.6	3.47%	37.40%
3rd	8.4	8	40.6%	41.5%	0.9%	0.4	0.36%	40.99%
4th	11.2	11	46.1%	46.6%	0.6%	0.2	0.11%	46.18%
5th	14	14	47.8%	48.2%	0.4%	0	0.00%	47.83%
6th	16.8	16	49.6%	51.6%	2.0%	0.8	1.60%	51.24%
7th	19.6	19	55.7%	57.0%	1.3%	0.6	0.77%	56.51%
8th	22.4	22	58.6%	59.4%	0.9%	0.4	0.35%	58.92%
9th	25.2	25	62.5%	62.6%	0.1%	0.2	0.02%	62.52%

Section 5
Significant Industrial Users

5.1 Identification of Potential Significant Industrial Users

Historically, twice per month, the City WWTP staff receive and review a report generated by the City of Helena Building Department listing new building permits issued. Before an application is approved by the City Building Department, the WWTP staff are included in a pre-application process which includes review of plans and an opportunity to provide input. Once per month, the City WWTP staff receive a Business License Report from City of Helena Utility Customer Service.

As of October 2018, the City of Helena hired a part time Pretreatment Coordinator. The Pretreatment Coordinator has taken over the responsibility of reviewing new building permits and updating the industrial user inventory. The Pretreatment Coordinator will partner with the WWTP staff as needed to evaluate businesses. The Pretreatment Coordinator will work with the City Building Department to approve applications. **The part time Pretreatment Coordinator left the City in March 2019. Between March 2019 and June 2021, City Engineering staff took over efforts to update the Industrial User inventory. The Industrial User inventory is up-to-date. A new Pretreatment Coordinator was hired in June 2021 and will continue efforts to update the Industrial User inventory. The Pretreatment Coordinator will continue to coordinate with the WWTP staff and other City Departments to maintain an up-to-date Industrial User inventory.**

~~The Pretreatment Coordinator is working to update the list of known industrial users and to develop an electronic database of industrial and commercial users.~~

5.2 Description of Current Industrial Users

Currently, there is one categorical industrial user and one significant industrial user which discharge to the City of Helena wastewater collection system. Both are explained below.

All sampling data is available upon request.

Decorative Industrial Plating, LLC. – Categorical Industrial User
Decorative Industrial Plating, LLC is located at 2531 N Dodge Avenue and offers chrome, copper, brass, nickel, and decorative gold platting for commercial and individual clients. Decorative Industrial Plating, LLC specializes in a variety of applications including automotive, aerospace, plumbing, firearms, food handling, and computer hardware products.

Decorative Industrial Plating, LLC has two metered City of Helena water services. One City water service supplies the sanitary uses (restrooms, breakroom sinks, etc.) The second City water service supplies the process water. The water meter total for the process water is recorded at the beginning of the quarter and at the end of the quarter to calculate the total number of gallons used for process water and subsequently discharged to the City's wastewater collection system.

Decorative Industrial Plating, LLC samples pH in the rinse tank daily when the facility is operating. Operation is defined as periods of time when platting is occurring at the facility. The discharge from the rinse tank, while operating, is a slow constant flow. Decorative Industrial Plating, LLC samples cyanide and metals (arsenic, cadmium, chromium, chromium-III, chromium-VI, copper, lead, mercury, molybdenum, nickel, selenium, silver, and zinc) once per quarter. Grab samples are collected for cyanide and metals and analyzed by Alpine Analytical, Inc. Decorative Industrial Plating, LLC reports all sampling values to the City as part of the quarterly Industrial User Monitoring Report. Copies of the 2014 through 2018 quarterly reports are included available upon request.

In addition to the quarterly self-monitoring performed by Decorative Industrial Plating, LLC, the WWTP staff performs annual sampling of Decorative Industrial Plating, LLC process wastewater at a sample port in the process line before connection to the sanitary sewer. The City samples are analyzed by Alpine Analytical, Inc. for pH, total metals, and total cyanide. Copies of the annual WWTP staff sampling of Decorative Industrial Plating, LLC are available upon request.

Montana Rail Link – Significant Industrial User

Montana Rail Link is located at 1500 Railroad Avenue. Rain and snow melt collect in track pans along the railroad tracks. There is potential for the collected runoff to come in contact with diesel fuel and lubricating oil used to service trains. The collected runoff is piped to an underground water/oil separator where the oil is recovered. The water is pumped to a 12,500 gallon above ground storage tank.

When the tank is full, a sample of the wastewater is collected and analyzed for benzene and BTEX. If the analysis shows acceptable levels of benzene (≤50 μg/L) and BTEX (≤570 μg/L), the wastewater is discharged to the collection system. If the analysis results in benzene and/or BTEX levels which exceed allowable discharge limits, the tank can be aerated and re-sampled before the tanks is discharged to the collection system.

Montana Rail Link submits an Industrial User Monitoring Report Form to the City of Helena WWTP on a monthly basis. During months where Montana Rail Link discharges to the collection system, they report the number of gallons discharged and the benzene and BTEX which is sampled prior to the discharge to the collection system. During months when Montana Rail Link does not discharge to the collection system, they report "no discharge". The Industrial User Monitoring Reports for 2014 to 2018 are available upon request.

Section 6
Local Limits Development Summary

6.1 USEPA Region 8 Technically-Based Local Limits Development Strategy

Technically based local limits for the City of Helena Wastewater Treatment Plant Pretreatment Program were developed using the USEPA-Region 8 Technically-Based Local Limits Development Strategy which included the Region 8 Technically-Based Local Limits Development Spreadsheet (Region 8 LL Spreadsheet). Completion of the Region 8 LL Spreadsheet required analysis of WWTP process data, sampling data, and gathering information from regulatory documents. The Region 8 LL Spreadsheet is included in Section 7 and the spreadsheets used to analyze data are include in Section 4.

Based on the local limits calculations completed in 2019, the WWTP has capacity to accept a high loading of pollutants from Industrial Users. Given the low volume of flow from Industrial Users, relative to total plant influent flows, the calculated local limits resulted in large concentration values. Updates described in this Section reflect more conservative approaches to local limits calculations in order to implement more reasonable concentration based local limits.

6.2 Regulatory Document References

Included hereinafter are the regulatory documents used as reference for completion of the Region 8 LL Spreadsheet. The document are:

- City of Helena MPDES Fact Sheet (Permit No MT0022641)
- City of Helena MPDES Discharge Permit (Permit No MT0022641)
- Montana Department of Environment Quality Circular DEQ-7: Montana Numeric Water Quality Standards

Note that the MPDES Discharge Permit expired on September 30, 2017. The City submitted all appropriate permit renewal application data. MDEQ has not issued a draft permit. Based on phone conversations with MDEQ, a permit writer has not been assigned to the City of Helena permit renewal **as of January** ~~**2019 and the projected draft permit may be issued**~~ in 2020. **As of June 2021, a permit writer has been assigned but there is no indication of when a draft permit is expected to be issued.** The City is assuming that the expired permit is administratively extended, although no formal documentation has been provided by MDEQ.

6.3 General Assumptions Used During Data Analysis

All data analysis used to complete the Region 8 LL Spreadsheet is included in the "Data Analysis" Spreadsheet which is included in Section 4. General assumptions used during data analysis are included below and more specific assumptions or explanations are included in Section 6.4.

6.3.1 Assumptions of Data Measured Below Detection Limits

Wherever pollutant scans reported non-detect results (which is denoted by Alpine Analytical, Inc as "<") for samples, half the sample method detection limit was used for analysis for all metals except mercury. Where a mercury sample reported non-detect results, one-eighth (1/8th) the sample method detection limit was used.

6.3.2 Conditioning of Data

The only condition of data used was averaging data sets. All averaging is included in the "Data Analysis" Spreadsheet.

6.4 Assumptions and Clarifications by Table

The following section details any assumptions or needed clarification for completion of the Region 8 LL Spreadsheet.

6.4.1 Table 1: General Data Entry

SIU Flow (MGD): Previously the SIU flow had been calculated assuming that the SIU flow is received at the WWTP as approximately equal daily flow. To calculate local limits using a more conservative approach, the SIU flow has been updated to assume that the maximum amount of flow from all SIUs is received at the WWTP at the same time. This is very unlikely based on discharge procedures from each SIU; however, this assumption represents the "worst case scenario" and provides the most conservative estimate.

Chronic and Acute Receiving Water Flows: Due to lack of a metals specific mixing zone study, the chronic and acute receiving water flow has been designated as 0 MGD. This is consistent with the expired MPDES permit rationale.

The City of East Helena, which discharges approximately 4 miles upstream of the City of Helena WWTP discharge, was recently issued a draft MPDES permit. The permit notes:

> PPC [Prickly Pear Creek], in the area of discharge, historically experience severely depleted stream flows in summer. The 2009-issued permit established a 7-day, 10-year low flow condition (7Q10) as zero (0) cfs for the purposes of discharge limit development. In 2008 a re-watering agreement was put into effect that reduced irrigation diversions during low flow periods in this portion of the stream. This agreement has continued to the present and the Lewis and Clark Water Quality Protection District has collected flow data at Wylie Drive bridge crossing for over ten years. DEQ used this data and compared it to the upstream USGS Gage 06061500 to develop 7Q10 and 14Q5 flows at the location of the East Helena WWTF discharge. For development of the permit limits in this renewal the 7Q10 is 8.34 CFS.

Based on this information it is anticipated that the chronic and acute receiving water flows should actually be larger than 0 MGD. However, 0 MGD is used in the calculations to be consistent with the existing City of Helena Permit.

Hardness: The Permit Statement of Basis lists 52 hardness samples with a minimum value of 46 a maximum value of 149 and an average value of 104 mg/L $CaCO_3$. The sampling by the Helena WWTP between October 2014 and April 2018 range between 90 and 135 mg/L $CaCO_3$. Based on City of Helena data, the 90th percentile for hardness is 134 mg/L $CaCO_3$. (Rationale for using 90th percentile hardness is found in the USEPA-Region 8 Technically-Based Local Limits Development Strategy document, page 32.) ~~Although there is evidence to support higher instream hardness than assumed in the permit, the value of 104 mg/L $CaCO_3$ will be used to develop the local limits.~~ **A hardness value of 134 mg/L was used based on the EPA's 4/15/2019 recommendation that the City use "the statistically valid hardness data of 134 mg/L $CaCO_3$ to calculate local limits".**

Drinking Water Supply Determination: The Permit Fact Sheet (Part I, C. Applicable Water Quality Standards) lists the receiving water as an "I" class surface water use as described in MCA 17.30.628. According to the 2014 303(d) list, Montana stream segment MT41I006_020 (Helena WWTP Discharge Ditch to Lake Helena) where the WWTP effluent is discharged is not fully supporting of drinking water as a beneficial use. However, to ensure the most stringent criteria are applied, the spreadsheet with reflect that the receiving water is a water supply.

6.4.2 Table 2: Daily Criteria and Standards

NPDES Permit Limits: The only NPDES Permit limits are for copper (0.013 mg/L) and zinc (0.11 mg/L).

State Acute Water Quality Standards: Since it was conservatively selected that Prickly Pear Creek be designated as a water supply, the Montana DEQ-7 Aquatic Life standards are applicable for the state acute water quality standards.

Chromium, Chromium (III), and Lead most stringent criteria: The most stringent criteria is the MCL for chromium, chromium III, and lead. However, the formula to select the most stringent criteria in column F does not assess the MCL in column G. Therefore, the formula in cells F14, F15, and F17 were edited to reflect that the MCL was the most stringent criteria. For all other pollutants, the MCL is less stringent than other criteria.

Absence of molybdenum criteria: There are no criteria with which to calculate an acute molybdenum limit. Acute molybdenum limits would be based on criteria from Table 2 of the EPA Region 8 Local Limits spreadsheet. When we evaluate the criteria:

- there are no MPDES permit limits for molybdenum (Column C),
- there are no state acute water quality standards (i.e., no acute water quality standards in MDEQ Circular 7) (Column D)
- there is no EPA acute water quality criteria (Column E)

Although there are no criteria for molybdenum, a 2018 Edition of the Drinking Water Standards and Health Advisory does include a health advisory of 0.08 mg/L for one-day and 10-day child consumption. This limit of 0.08 mg/L is applied under "other criteria".

6.4.3 Table 3: Daily Criteria and Standards

NPDES Permit Limits: The only NPDES Permit limits are for copper (0.009 mg/L) and zinc (0.11 mg/L).

State Chronic Water Quality Standards: Since it was conservatively selected that Prickly Pear Creek be designated as a water supply, the Montana DEQ-7 Aquatic Life standards are applicable for the state acute water quality standards.

Absence of molybdenum criteria: There are no molybdenum criteria.

- there are no MPDES permit limits for molybdenum (Column C),
- there are no state chronic water quality standards (i.e., no chronic water quality standards in MDEQ Circular 7) (Column D)
- there is no EPA chronic water quality criteria (Column E)

Although there is no criteria for molybdenum, a 2018 Edition of the Drinking Water Standards and Health Advisory does include a health advisory of 0.08 mg/L for one-day and 10-day child consumption. This limit of 0.08 mg/L is applied under "other criteria".

6.4.4 Table 4: Influent and Effluent Data

The average influent and effluent concentrations of pollutants were generated by averaging the monthly data collected between October 2014 and December 2015 and the quarterly data collected between January 2016 and October 2018 as discussed in Section 4. The "Data Analysis" Spreadsheet which shows the raw data and averages is include in Section 4.

6.4.5 Table 5: Pollutant Loading and Receiving Water

The SIU loading to the POTW was based on the SIU data from 2014 through 2018 included in Section 4. The domestic and commercial contributions were based on the average of characterization samples conducted in the spring of 2016 **and samples collected on November 4, 2020 and January 13, 2021. The purpose of the additional sampling was to provide 10 data points to ensure a representative uncontrollable sector data set. Prior to conducting the 2020 and 2021 uncontrollable sector sampling, the City evaluated the collection system and determined that selected locations were representative of the service area. The City determined the service area has not changed significantly since 2016. Therefore, the complete uncontrollable sector data set from 2016, 2020, and 2021 is representative of the current uncontrollable sector**. The trucked/hauled loading and receiving stream concentrations were based on data collected between 2014 and 2015. The "Data Analysis" Spreadsheet in Section 4 shows all raw data and averaging.

In the June 17, 2021 email, EPA noted a data discrepancy for Arsenic (AS) uncontrollable domestic loading between the "Data Analysis" spreadsheet and the Region 8 LL Spreadsheet (Table 5, Column E). This data discrepancy resulted in incorrect calculations in subsequent

Tables. The Region 8 LL Spreadsheet Table 5, Column E arsenic has been corrected to 0.005 mg/L. Therefore, subsequent Tables have also been corrected.

6.4.6 Table 6: Biosolids

POTW Biosolids to Disposal: The values were determined from the 2014 through 2018 Annual Biosolids Reports. The Annual Biosolids Reports are available upon request. The "Data Analysis" Spreadsheet in Section 4 shows all raw data and averaging.

6.4.7 Table 7: Removal Efficiency Calculations

Discussion of Applicability of Removal Efficiency Calculation Methods:

- Influent/Effluent Method- This method is calculated within the EPA Region 8 Spreadsheet using the average data entered in Table 4.
- ADRE and MRE Methods- In accordance with EPA Region 8 Local Limit Development Appendix L, Page 115 "Whenever an influent sample is zero (or was reported as below the detection level and assigned a value of zero), a DRE cannot be calculated regardless of the effluent value. Therefore, influent/effluent data pairs for which the influent level is zero must be removed from the data set before calculating removal efficiencies using the ADRE approach and the decile approach. However, the POTW can use these data in calculating a removal efficiency using the MRE method since the MRE method does not involve the calculation of individual DREs from each pair of influent and effluent values"
- Decile Method- The decile method can only be used if nine data points exist.
- Literature Value- From EPA Region 8 Appendix K

Table 6-1 Rationale for Removal Efficiency Method Chosen

Parameter	Removal Efficiency to Be Used (Column I)	Rationale for Removal efficiency Methods Chosen
Arsenic	INFEFF	27 of 27 DREs could be calculated. The lowest was 0 and the highest was 70%. Based on similar removal values from the various methods, INFEFF method is a conservative estimate of arsenic removal.
Cadmium	LIT	Given 20 of 27 effluent cadmium samples resulted in non-detect values, it is difficult to quantify the actual removal efficiency of cadmium in the treatment process. Because the calculations do not reflect the quantifiable reduction of cadmium. Given that results of the decile method are similar to literature values. Literature value was used.

Chromium	**INFEFF** ~~LIT~~	**Although it is difficult to quantify actual removal efficiency for chromium, the INEFF value provides a more conservative removal efficiency estimate than the LIT Values.** ~~Given 19 of 27 effluent chromium samples resulted in non-detect values, it is difficult to quantify the actual removal efficiency of chromium in the treatment process. Therefore, literature values are the most reasonable removal efficiency to use.~~
Chromium (III)	**INFEFF** ~~LIT~~	**Although it is difficult to quantify actual removal efficiency for chromium, the INEFF value provides a more conservative removal efficiency estimate than the LIT Values.** ~~Given 19 of 27 effluent chromium (III) samples resulted in non-detect values, it is difficult to quantify the actual removal efficiency of chromium (III) in the treatment process. Therefore, literature values are the most reasonable removal efficiency to use.~~
Chromium (VI)	**INFEFF** ~~LIT~~	**Although it is difficult to quantify actual removal efficiency for chromium, the INEFF value provides a more conservative removal efficiency estimate than the LIT Values.** ~~None of the chromium (VI) effluent samples resulted in a detectable value. None of the removal efficiency methods provide a good estimate of actual removal. Therefore, literature values are the most reasonable removal efficiencies to use.~~
Copper	**Decile** ~~INFEFF~~	**WWTP data and bench scale testing support high percentage of copper removal.** ~~Given that most of the influent and effluent values for copper result in numeric values above the method detection limits. All removal efficiency calculation methods provide useful data. INFEFF method was selected because it is representative of the actual removal efficiencies.~~
Lead	DECILE	Using the DECILE method results in a more conservative removal efficiency that calculated with the MRE or INFEFF methods.
Mercury	INFEFF	Given 20 of 27 effluent mercury samples resulted in non-detect values, it is difficult to quantify the actual removal efficiency of in the treatment process. INFEFF removal efficiency is used because it is more conservative than other removal efficiency estimates.
Molybdenum	**INFEFF** ~~LIT~~	**The INFEFF values provides a more conservative estimate.** ~~Based on similar removal values from the various methods, INFEFF method is a conservative estimate of removal.~~

Nickel	INFEFF	Given 17 of 27 effluent nickel samples resulted in non-detect values, it is difficult to quantify the actual removal efficiency of nickel in the treatment process. The INFEFF removal efficiency was used because it is more conservative than the literature value.
Selenium	INFEFF	The raw data shows that selenium removal efficiencies are less than literature values; however, the removal efficiency is not as low as the ADRE and DECILE method estimate. Therefore, the INFEFF method was selected.
Silver	LIT	Since all silver influent and effluent samples were not detect, none of the removal efficiency methods provide a good estimate of actual removal. Therefore, literature values are the most reasonable removal efficiencies to use.
Zinc	INFEFF	Given that most of the influent and effluent values for zinc result in numeric values above the method detection limits. All removal efficiency calculation methods provide useful data. INFEFF method was selected because it is representative of the actual removal efficiencies.

Sludge Removal Efficiency: No sludge removal efficiency was entered due to lack of adequate data to quantify sludge removal efficiency.

6.4.8 Table 8: Daily MAHL Calculations

Table 8 is automatically calculated. No assumptions were used.

6.4.9 Table 9: Monthly MAHL Calculations

Table 9 is automatically calculated. No assumptions were used.

6.4.10 Table 10: Daily Local Limits

This table is not used because the City is setting monthly and daily local limits.

6.4.11 Table 11: Daily Local Limit Summary

This table is not used because the City is setting monthly and daily local limits.

6.4.12 Table 12: Daily Local Limits

~~Safety/Expansion Factor: The EPA recommended 15% is used.~~

Column F: Safety/Expansion Factors were evaluated based on each individual pollutant. Generally, pollutants have a minimum safety/expansion factor of 20%. Copper and Zinc were assigned the originally determined 15%. The final MAHL for some pollutants is so large that safety/expansion factors were increased to 50%, 70%, or 90% to provide a more conservative approach. The resulting safety/expansion factors are noted below.

Table 6-2 Daily Max Safety/Expansion Factor

Parameter	Safety/Expansion Factor % for Daily Max Limits (Column F)
Arsenic	20
Cadmium	20
Chromium	90
Chromium (III)	90
Chromium (VI)	70
Copper	15
Lead	50
Mercury	20
Molybdenum	70
Nickel	70
Selenium	20
Silver	70
Zinc	15

Column L: Mass Reserve. Although the City generally does not reserve mass for hauled waste, this column was used to limit the maximum MAL for each pollutant to 1 lb/day. The mass reserve was utilized for copper, lead, and nickel.

6.4.13 Table 13: Monthly Local Limits

~~Safety/Expansion Factor: The EPA recommended 15% is used.~~

Column F Safety/Expansion Factors were evaluated based on each individual pollutant. Generally, pollutants have a minimum safety/expansion factor of 20%. Copper was assigned 11%, and Zinc was assigned 15%. The final MAHL for some pollutants is so large that safety/expansion factors were increased to 50%, 70%, or 90% to provide a more conservative approach. The resulting safety/expansion factors are noted below.

Table 6-3 Daily Max Safety/Expansion Factor

Parameter	Safety/Expansion Factor % for Daily Max Limits (Column F)
Arsenic	20
Cadmium	20
Chromium	90
Chromium (III)	90
Chromium (VI)	70
Copper	11
Lead	50
Mercury	20
Molybdenum	20
Nickel	70
Selenium	20
Silver	90
Zinc	15

6.4.14 Table 14: Local Limit Summary for Daily and Monthly LL

Table 14 is automatically calculated or utilizes user entered values. No assumptions were used.

DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMITTING and COMPLIANCE DIVISION
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES)

Fact Sheet

PERMITTEE:	City of Helena
PERMIT NUMBER:	MT0022641
RECEIVING WATER:	Prickly Pear Creek via City of Helena Effluent Ditch
FACILITY INFORMATION:	
Name:	City of Helena Wastewater Treatment Plant
Location:	2108 Custer Avenue East Helena, MT 59601
Contact:	Don Clark, Water and Wastewater Superintendent 2108 Custer Avenue East Helena, MT 59601 (406) 457-8556
FEE INFORMATION:	
Number of Outfalls:	1 (for fee determination purposes)
Type of Outfall:	001 – Major, Publicly-Owned Treatment Works (POTW), 5.4 million gallon per day (mgd) activated sludge mechanical treatment plant with UV disinfection and continuous discharge to surface water.

I. Permit Status

The current Montana Pollutant Discharge Elimination System (MPDES) permit for the City of Helena Wastewater Treatment Plant (WWTP) was issued December 11, 1996 and became effective on January 1, 1997. It expired at midnight, October 31, 2001. It was modified February, 7, 1997; July 1999; March 28, 2000; and February 28, 2001. On March 12, 2001, the permittee submitted an application and the associated fees for the renewal of the MPDES permit using MT Short Form 2A. In accordance with ARM 17.30.1313, the permit was administratively extended at that time.

At the request of the Department of Environmental Quality (Department), the permittee submitted application form EPA-2A with updated information regarding the WWTP signed and dated October 22, 2002. A second updated application package including forms DEQ-1 and EPA 2A was submitted February 9, 2009, again at the Department's request.

The permittee submitted an application package and the fees associated with a request for a new outfall discharging to a new receiving water signed and dated February 16, 2010. An application deficiency letter from the Department was sent to the permittee March 23, 2010. On April 12, 2010, following a meeting with the permittee, their consultants, and the Department, it was determined that:

- this permit renewal would not include a new outfall;
- the Department and permittee would work together to obtain the information needed to permit a new outfall to a new receiving water; and
- the permittee can apply for a major modification of permit during the next permit cycle to include Outfall 002, towards which the fees received March 5, 2010 (applicable to permitting a new outfall) will be applied.

II. Facility Information

A. Facility Description

The Helena WWTP serves the residents and businesses of the City of Helena (City) and annexed areas of Lewis and Clark County, with service to an estimated population of 30,000 (2010 renewal application for EPA 2A). The 1976-built WWTP [design flow 6 million gallons per day (mgd),] most recently underwent upgrades in 1999-2000 [Operations and Maintenance (O&M) Manual, Morrison-Maierle, Inc. (MMI) December 2000] to install biological nutrient removal and ultra-violet light (UV) disinfection capabilities.

The current WWTP is an activated sludge, biological nutrient removal treatment plant with two-stage anaerobic sludge digestion. Design average flow is 5.4 million gallons per day (mgd), peak daily flow is 7.3 mgd, and peak hourly flow is 22.0 mgd. Decreased inflow and infiltration (I/I) due to reduction efforts on the part of the City have resulted in lowered flows to the POTW while service population increased. Minimum detention time is approximately 20 hours (based on volumes available in the WWTP Operation and Maintenance Manual, December 2000). Continuous discharge is to the City of Helena ditch constructed solely for the transport of treated effluent to Prickly Pear Creek via Outfall 001. The effluent is disinfected seasonally (April through October) using UV.

Influent flow is measured with a Parshall flume (primary device) and ultrasonic meter (secondary device). Effluent flow monitoring occurs post UV disinfection system at a Cipolletti weir and staff gauge with an ultrasonic meter secondary device. Table 1 is a summary of the Helena WWTP design criteria from the Morrison-Maierle, Inc. 2000 Operation and Maintenance Manual.

Table 1. Current Design Criteria Summary – Helena WWTP

Facility Description: Continuous discharge, biological nutrient removal, activated sludge treatment system with UV disinfection and anaerobic sludge digestion.	
Construction Date: 1976, major upgrades in 2000	Modification Date: 2000
Design Year: 2020	
Design Population: 37,000	Population Served: ~30,000
Design Flow, Average Daily (mgd): 1976 - 6.0 2000 - 5.4	Design Flow, Peak Daily (mgd): 1976 – 7.1, 2000 – 7.3
Minimum Detention Time (BNR Sludge System): approximately 20 hours	
Design Biochemical Oxygen Demand Removal (%): 95	Design BOD_5 Load (lb/day): 9,300
Design Total Suspended Solids Removal (%): 95	Design TSS Load (lb/day): 11,900
Design Total Ammonia Removal (%): 90	Design Ammonia Load (lb/day): 950
Collection System: Combined [ ] Separate [X]	
SSO Events: none reported	Number: NA
Bypass Events: none reported	Number: NA
Inflow and Infiltration Contribution (mgd): 0.120	Source: storm events, surface infiltration through manholes, old sewer mains
Disinfection: Yes	Type: UV
Discharge Method: Continuous	
Effluent Flow Primary Device: Cipolletti weir	
Effluent Secondary Flow Device: ultrasonic flow meter	
Sludge Storage: anaerobic digester	
Sludge Disposal: composting and land application	EPA Authorization Number: MTG650005

The collections system consists of approximately 174 miles of gravity sewers with only four miles of force main. It serves the population of the City of Helena and areas of Lewis and Clark County (30,000 people) with approximately 9,575 residential (92%) and commercial (8%) connections covering an area of over 9,600 acres. Fifty percent of the collection system is between 50 and 75 years old; 30 percent is between 25 and 50 years old, and the remainder is less than 20 years old. There are currently five lift stations with plans to upgrade one existing lift station and to add a sixth. Inflow and Infiltration (I/I) are estimated to be 120,000 mgd primarily due to storm events and surface infiltration through manholes and old sewer mains (Utility Superintendent, personal communication, April 2010).

The permittee maintains authorization MTG650005 under the United States Environmental Protection Agency (EPA) Region VIII Permit Number MTG650000, General Permit for Facilities/Operations that Generate, Treat, and/or Use/Dispose of Sewage Sludge by Means of Land Application, Landfill, and Surface Disposal Under the National Pollutant Discharge Elimination System. Biosolids are sent to a local composting facility and are land applied.

The Industrial Pretreatment Program was approved by Region 8 of the US Environmental Protection Agency (EPA) on July 24, 1986. The City currently has permitted two Industrial Users (IU) and one Categorical Industrial User (CIU) [(2009 Industrial Pretreatment Program (IPP) Annual Report], as follows:

- the IU Montana Rail Link rail yard [Standard Industrial Classification (SIC) code 4011] is permitted for the batch discharge of approximately 280 gallons per day (gpd) of collected and treated (oil/water separation) run-off water with IPP permit limits for benzene and benzene, toluene, ethylbenzene and xylene (BTEX);

- the IU Jolly O's (SIC code 5541) intermittent discharge of approximately 5,230 gpd from the groundwater gas extraction wells following air stripping treatment with IPP permit limits for benzene and BTEX. The business Jolly O's has been shut down since December 2009 and they have not requested the permit to be terminated; and

- the CIU Decorative Industrial Plating (North American Industrial Classification System code 332812) subject to the new source performance standards in the federal Effluent Limitation Guidelines (ELG) metal finishing subcategory [40 Code of Federal Regulations (CFR) Chapter I, Subchapter N, Part 433.17(a)]. IPP permit limits have been established by the City for total recoverable metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc) and total cyanide. Monitoring for total toxic organics as defined in Part 433.11(e) is required by the IPP.

On June 25, 2009, the City was issued a Findings of Violation and Order for Compliance, CWA-08-2009-0052 (AOC) by the EPA regarding the City's IPP in response to the introduction of elevated levels of hexavalent chromium to the POTW and the subsequent violation of the MPDES permit for total ammonia as N in the effluent. As of April 2010, the City has complied with all action items associated with the AOC (personal communication EPA MT Office, March 2010).

B. Effluent Characteristics

Effluent data from the facility Discharge Monitoring Reports (DMR) for the Period of Record (POR) January 2005 through December 2009 are summarized in Table 2. Elevated concentration values known to be due to an upset condition at the POTW that affected the biological nutrient removal process for nitrogen were not used in this analysis.

Table 2. DMR Effluent Characteristics for POR January 2005 through December 2009.

Parameter	Location	Units	Previous Permit Limit	Minimum Value	Maximum Value	Average Value	Number of Samples
Flow, Daily Average	Effluent	mgd	(1)	2.47	4.98	2.72	60
Biochemical Oxygen Demand (BOD_5)	Influent	mg/L	(1)	231	369	288	60
	Effluent	mg/L	45/30 (2)	4.2	18.2	8.3	60
	Effluent	% removal	85	92.8	98.2	97.1	60
	Effluent	lb/day	1,404 (3)	93	389	189	60
Total Suspended Solids (TSS)	Influent	mg/L	(1)	224	347	270	60
	Effluent	mg/L	45/30	2.0	11.3	5.5	60
	Effluent	% removal	85	95.2	99.2	97.9	60
	Effluent	lb/day	1,501 (3)	44	241	125	60
Fecal Coliform Bacteria (4), 30-day median value	Effluent	Number per 100 mL	varied based on month	4	83	15	25
pH, median value	Effluent	s.u.	6.0-9.0	6.0	8.1	6.8	60
Temperature	Effluent	ºC	--	--	--	--	0
Total Residual Chlorine	Effluent	mg/L	2.0	--	--	--	0
Total Ammonia as N minus upset data	Effluent	mg/L	varied based on month	<0.10	3.62	0.77	59
TKN minus upset data	Effluent	mg/L	(1)	0.57	11.2	3.31	58
Nitrate + Nitrite as N minus upset data	Effluent	mg/L	(1)	2.8	6.92	4.61	58
Total Nitrogen (TN) (5) minus upset data	Effluent	mg/L	(1)	4.0	15.1	8.1	58
		lb/day	(1)	104	349	180	58
Total Phosphorus as P (TP)	Effluent	mg/L	(1)	0.27	7.73	3.83	60
		lb/day	(1)	6.01	181.8	86.8	60
Aluminum, Dissolved	Effluent	mg/L	(1)	ND	ND	ND	0
Antimony, Total Recoverable	Effluent	mg/L	(1)	<0.100	0.005	<0.0032	9
Arsenic, Total Recoverable	Effluent	mg/L	(1)	<0.001	0.005	0.0045	20
Cadmium, Total Recoverable	Effluent	mg/L	(1)	<0.0005	0.001	<0.001	20
Copper, Total Recoverable	Effluent	mg/L	(1)	<0.001	0.070	0.019	20
Lead, Total Recoverable	Effluent	mg/L	(1)	<0.001	0.010	<0.0082	20
Zinc, Total Recoverable	Effluent	mg/L	(1)	<0.035	0.200	<0.100	20
Whole Effluent Toxicity, chronic	Effluent	Pass/Fail	(1)	--	--	Pass	17

Footnotes: ND means "no data"
(1) No effluent limitation in previous permit, monitoring requirement only.
(2) Average Weekly/Average Monthly Values.
(3) Nondegradation load value. BOD_5 and TSS loads were based on removal efficiency (percent).
(4) Sample period is April 1 through October 31.
(5) TN is calculated as the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen (TKN) concentrations.

C. Compliance History

Review of the DMRs shows that the permittee violated the monthly effluent limitation for total ammonia as N in November of 2008 at 10.48 mg/L while the limitation was 3.03 mg/L as a 30-day average. The loss of ammonia removal was first noted by plant personnel October 21, 2008 (self-reported) and lasted until the re-establishment of full treatment around November 25, 2008 after aggressive trouble-shooting efforts by the permittee. This loss of treatment was at first attributed to the presence of dead animals in the effluent UV channel. However, subsequent events and monitoring at the WWTP identified toxic inhibition of the nitrification treatment process most likely caused by the introduction of hexavalent chromium to the WWTP.

This series of suspected toxic releases to the POTW resulted in a Findings of Violation and Order for Compliance (CWA-08-2009-0052, June 2009) by the EPA for alleged violations of the City's IPP, specifically the failure to control discharges from all significant industrial users and to prepare and maintain an IU survey. As of April 2010, the City has complied with all action items associated with the AOC (personal communication EPA MT Office, March 2010).

A number of MPDES compliance inspections have been conducted since January 2005: March 24, 2006; April 27, 2006 (reconnaissance/enforcement response inspection); May 2, 2006 (Sanitary Sewer Overflow Inspection); May 30 through June 1, 2006 (performance audit); May 15, 2007; and February 17, 2010. Primary issues of concern were identified as the quality assurance/quality control practices and procedures used in the in-house laboratory and reporting calculation errors. A violation letter resulting from the inspection conducted February 17, 2010 cited the following violations of permit conditions:

- Time-proportioned 24-hour composite samples were being collected, not flow-proportioned as required by permit;
- DMR load calculations for BOD_5, TSS, TN, and TP were performed incorrectly; and
- Field and laboratory instruments lacked calibration logs.

The permittee corrected these violations and responded to the Department March 29, 2010.

A Sanitary Sewer Overflow (SSO) inspection was conducted by Department personnel on May 2, 2006. On July 30, 2009, a citizen complaint was filed (CVID number 13373) due to an overflow event. It was attributed to pumping of sewer water into the street by a contractor during clean up and repairs of a failed lateral line. The complaint was resolved by City and Lewis and Clark County Health Department personnel and was subsequently closed by the Department.

A citizen complaint was filed March 31, 2006 (CVID number 10123) alleging that WWTP personnel purposefully by-pass untreated wastewater to the effluent ditch. Department personnel conducted an inspection April 27, 2006 and could not validate the assertions made in the citizen complaint. The Department closed the complaint.

III. Proposed Technology-based Effluent Limits (TBELs)

A. Applicability

The Board of Environmental Review has adopted by reference 40 CFR 133 which set minimum treatment requirements for secondary treatment or equivalent for POTW (ARM 17.30.1209). Secondary treatment is defined in terms of effluent quality as measured by BOD_5, TSS, percent removal of BOD_5 and TSS, and pH [National Secondary Standards (NSS)]. National secondary treatment requirements are described in 40 CFR 133 and incorporated into all municipal permits.

The regulations in 40 CFR 133.105 allow for the application of treatment equivalent-to-secondary effluent limitations (TES) or Alternative State Requirements for TSS (ASR) to facilities that meet specific criteria. To qualify for TES, the facility must use either a trickling filter or waste stabilization pond as the principle process of treatment as stated in 40 CFR 133.101(g)(2). The Helena WWTP does not use these treatment processes. Technology-based effluent limitations established in the previous permit cycle reflected the use of NSS. These limitations for BOD_5, TSS, BOD_5 and TSS percent removal, and pH will be maintained in this permit renewal.

ARM 17.30.1345(8) requires that all effluent limitations be expressed in terms of mass except for pollutants which cannot be appropriately expressed in terms of mass. The previous mass-based limitations utilized the design flow of 6.0 mgd. Because the new facility average daily design flow is actually 5.4 mgd versus the original average daily design flow of 6.0 mgd (O&M Manual, MMI December 2000), it is necessary to recalculate the mass-based load limitations.

The following equation was used to calculate mass-based loading limits in pounds per day (lb/day) using NSS limitations at the upgraded new average daily design flow of 5.4 mgd.

Load (lb/day) = Design Flow x Concentration Limit (mg/L) x 8.34 (lb·L)/(mg·gal)

<u>BOD_5 and TSS Mass-based Load Limitations at Upgraded Flow</u>:

30-day average load (lb/day) = (5.4 mgd)(30 mg/L)(8.34) = 1,351 lb/day
7-day average load (lb/day) = (5.4 mgd)(45 mg/L)(8.34) = 2,027 lb/day

Loading limits for technology-based parameters of concern (BOD_5 and TSS) will apply to the effluent and will be maintained at the more stringent of the nondegradation allocations or mass-based loading limits calculated in this Fact Sheet.

B. Nondegradation Load Allocations

The provisions of ARM 17.30.701 - 718 (Nondegradation of Water Quality) apply to new or increased sources of pollution [ARM 17.30.702(18)]. Sources that are in compliance with the conditions of their permit and do not exceed the limitations established in the permit or determined from a permit previously issued by the Department are not considered new or increased sources.
Nondegradation threshold values for the Helena WWTP were calculated for Total Nitrogen (TN), Total Phosphorus (TP), BOD_5 and TSS as part of the renewal of the permit in 1996 using an average daily design flow of 6.0 mgd. The Department calculates nondegradation load allocations for parameters for which numeric water quality standards exist and for which permit limitations were in place on April 29, 1993. The TN and TP load allocations presented in the fact sheet for the previous permit, which were used to determine whether the discharge would constitute a "new or increased" source Montana's nondegradation rules, no longer apply. That is because the receiving stream is no longer "high quality" in terms of nutrients, since it is listed for nutrients on the Montana 303(d) list of impaired waters. Therefore, the TN and TP allocations in the previous fact sheet will not be used to establish permit limits in this renewal.,

The BOD_5 and TSS loads were calculated using the 85 percent removal criteria for these parameters. Nondegradation load values are calculated using the loading equation presented above, not the TBEL for removal efficiency. Therefore, the corrected nondegradation load calculations are presented herein.

Corrected BOD_5 and TSS Nondegradation Load Values:

Monthly average load (lb/day) = (6.0 mgd)(30 mg/L)(8.34) = 1,501 lb/day
Weekly average load (lb/day) = (6.0 mgd)(45 mg/L)(8.34) = 2,252 lb/day

The actual average loads discharged from the facility for the POR are presented below in Table 3. Actual average loads for BOD_5 and TSS were calculated from the facility DMR data. These data indicate that the facility did not exceed the nondegradation load values calculated for BOD_5 and TSS.

Table 3. Nondegradation and Actual Loads for POR

Parameter	Units	Nondegradation Allocated Average Load	Actual Annual Average Load				
			2005	2006	2007	2008	2009
BOD_5	lb/day	1,501 (corrected)	177	188	193	198	189
TSS	lb/day	1,501	112	152	123	135	106

C. Proposed TBELS

Table 4. Outfall 001 Proposed TBELS

Parameter	Concentration (mg/L)		Load (lb/day)	
	Average Monthly Limitation (1)	Average Weekly Limitation (1)	Average Monthly Limitation (1)	Average Weekly Limitation (1)
BOD_5	30	45	1,351	2,027
TSS	30	45	1,351	2,027
pH, s.u	Within the range of 6.0 to 9.0 (instantaneous)			
BOD_5 Percent Removal	85 %			
TSS Percent Removal	85 %			
(1) See Definition section at end of permit for explanation of terms				

IV. Water Quality-based Effluent Limits (WQBELs)

A. Scope and Authority

The Montana Water Quality Act (Act) states that a permit may only be issued if the Department finds that the issuance or continuance of the permit will not result in pollution of any state waters [75-5-401(2), Montana Code Annotated (MCA)]. Montana water quality standards at ARM 17.30.637(2) require that no wastes may be discharged such that the waste either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard. ARM 17.30.1344(1) adopts by reference 40 CFR 122.44 which states that MPDES permits shall include limits on all pollutants which will cause, or have a reasonable potential to cause an excursion of any water quality standard, including narrative standards. The purpose of this section is to provide a basis and rationale for establishing WWTP effluent limits, based on Montana water quality standards that will protect designated uses of the receiving stream.

In accordance with 75-5-703(6)(b), MCA, after completion and approval of a Total Maximum Daily Load (TMDL), the Department shall incorporate the TMDL-developed waste load allocation(s) for point sources into the appropriate discharge permits. This permit renewal incorporates the Lake Helena Watershed TMDL (EPA, Ref. 8-MO, September 27, 2006.)

B. Receiving Water

The Helena WWTP discharges via the ditch constructed solely to transport the treated effluent to Prickly Pear Creek (PPC) at a point approximately six miles above the mouth at Lake Helena. PPC is in the Upper Missouri River watershed as identified by USGS Hydrologic Unit Code 10030101. Discharge is to Montana stream segment MT41I006_020, Helena WWTP Discharge Ditch to Lake Helena.

This segment of PPC is classified "I" according to ARM 17.30.610(1)(a)(ix) as it does not fully support any one of its beneficial uses according to the 1996 303(d) list of impaired waterbodies in need of a TMDL. The goal is for class I waters to fully support: drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supplies [ARM 17.30.628(1)].

The probable causes for the 1996 impairment listing are flow alteration, metals, nutrients, un-ionized ammonia, siltation, suspended solids, and other habitat alterations. Probable sources are identified as agriculture, pasture land, irrigated crop production, placer mining, resource extraction, subsurface mining, highway/road/bridge construction, domestic wastewater lagoons, and municipal point sources.

The 2008 303(d) lists this segment of the creek as not supporting aquatic life; cold and warm water fisheries; and drinking water. PPC is partially supportive of agricultural, industrial, and primary contact recreation. Probable causes of impairment are identified as metals (dissolved aluminum, antimony, arsenic, cadmium, copper, lead, and zinc), un-ionized ammonia, temperature, sedimentation/siltation, low flow alterations, physical substrate habitat alterations, and alteration in stream-side or littoral vegetative covers. The probable sources of these impairments include grazing in riparian or shoreline zones, irrigated crop production, on-site treatment systems (septic and similar decentralized systems), acid mine drainage, contaminated sediments, industrial point source discharge, habitat modification (other than hydromodification), and impacts from abandoned mine lands (inactive).

The segment of PPC immediately upstream of the receiving water is MT41I006_030 - PPC between Wylie Drive and the Helena WWTP effluent ditch. According to the Source Assessment for the Lake Helena Watershed Planning Area, Part C.3.1.4, [*Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume I – Appendices*, USEPA, December 2004; hereinafter referred to as the TMDL Vol. I.], PPC in this segment experiences "severely depleted stream flows in summer". The stream was rated as "non-functional" with the most detrimental impact identified as stream dewatering and "source assessment features included a dry streambed". It is noted that the stream regains flow from groundwater discharge at the lower end of the segment just above the WWTP ditch.

Part C.3.1.5 of the TMDL Vol. I, characterizes stream segment MT41I006_020 PPC from the Helena WWTP Discharge Ditch to Lake Helena as "non-functional". Upstream dewatering of the channel influences flow dynamics and there are some groundwater contributions to flow in the segment below the WWTP discharge. However, flow data in the area of discharge are minimal.

In 1995, the permittee provided an assessment of the receiving water flows for proposed permit modifications (Black & Veatch, July 1995). These data were collected in PPC at a point approximately 100 meters upstream of the confluence with the discharge ditch. In that report, zero flow was assumed for the months of December and February for limit calculations. Between 2005 and 2009, the Montana Department of Natural Resources and Conservation collected flow data at the crossing of PPC and York Road, approximately one mile upstream of the discharge point. Those data show flows during April through November vary between 1.8 cubic feet per second (cfs) and 665 cfs. Because flow data for the winter months are lacking and past effluent limits were based on a low flow condition of zero cfs, zero cfs will be used as the low flow criterion for limitation development in this permit renewal.

The Montana Fish, Wildlife and Parks (MFWP) MFISH website identifies river miles 7.3 to 18.5 (the segment of PPC encompassing the point of discharge) as an area of chronic dewatering where dewatering is a significant problem in all years of the assessment (MFWP 1991, 1997, 2003, and 2005). Fish species commonly present as year-round residents include the mottled sculpin, longnose sucker, and white sucker. The brook trout is present as a rare species year-round. The rainbow is commonly present and the brown trout is abundant; both species primarily migrate through this segment. The longnose dace is a year-round resident of unknown abundance (MFISH website, April 2010). Early life stages of each of these species can be present year-round (*Spawning Times of Montana Fishes* D. Skaar, MFWP, March 2001).

For the purpose of characterizing the receiving water, data were obtained from a variety of upstream sources. These data are summarized in Table 5:

- Between 2003 and 2009, the EPA conducted sampling of PPC in support of on-going watershed monitoring in association with the Lake Helena TMDL:
  - In East Helena at the Highway 12 bridge;
  - In East Helena, 200 yards upstream of Wylie Drive;
  - At the Canyon Ferry Road bridge;
  - Upstream of the Helena WWTP Discharge;
  - At the York Road bridge.

- The City of East Helena collected downstream data between 2003 and 2008 in support of the MPDES permit, approximately 1 mile downstream of Wylie Drive.

- The USGS collected some data between 1990 and 2007 from:
  - Gauging station 06062000-PPC at East Helena;
  - Gauging station 06602100-PPC below East Helena;
  - USGS 463701111573901-PPC at Canyon Ferry Road near Helena, MT;
  - USGS 46381111590101-PPC above Helena effluent canal at Helena; and

- Between May of 2006 and November 2009, the City of Helena has collected data from PPC at a point approximately 100 meters upstream of the confluence with the discharge ditch.

Table 5. Ambient Water Quality for Prickly Pear Creek Upstream of Outfall 001

Parameter	Units	Minimum Value	Maximum Value	Long Term Average	Number of Samples
pH, median value	s.u.	5.36	9.36	7.85	114
Temperature	°C	-0.1	24.2	10	124
Dissolved Oxygen	mg/L	6.3	13.8	9.7	49
Total Nitrogen	mg/L	<0.43	1.61	<0.96	27 (calc.)
Total Ammonia as N	mg/L	<0.01	1.60	0.39	28
Total Phosphorus as P	mg/L	0.013	0.149	0.038	47
Chlorophyll *a*	mg/m^2	<0.5	92.4	<43.8	11
Total Hardness as $CaCO_3$	mg/L	46	149	104	52
Aluminum, Dissolved	µg/L	--	--	32	1
Antimony, Total Recoverable	µg/L	--	--	<1	1
Arsenic, Total Recoverable	µg/L	4	30	11	8
Cadmium, Total Recoverable	µg/L	<0.20	0.36	<0.28	8
Copper, Total Recoverable	µg/L	<2	14	4	8
Lead, Total Recoverable	µg/L	<4	6.7	<5	8
Zinc, Total Recoverable	µg/L	14	110	67	7

C. Applicable Water Quality Standards

Pursuant to ARM 17.30.628(2) discharges to "I" class waters may not violate the specific water quality standards listed under ARM 17.30.628(2)(a through k). In addition, discharges are subject to ARM 17.30.635 through 637, 641, 645, and 646. ARM 17.30.635(4) requires that the design condition for disposal systems must be based on the seven-day, ten-year low flow condition (7Q10) of the receiving water.

In September of 2006, the EPA approved the TMDL for the Lake Helena TMDL Planning Area (US EPA Ref. 8-MO, September 27, 2006). Enclosure 2 of the detailed EPA TMDL review acknowledges that phased Waste Load Allocations (WLA) are proposed for nutrient discharges from point sources. The adaptive management strategy (Part 3.2.3.1., Volume II, Final Report, August 2006) allows for the modification of TMDL-developed WLA through the rule-making process associated with the adoption of Montana nutrient standards and/or the adaptive management process, itself.

The Lake Helena TMDL presents a three-phased plan to reduce nutrient loading from the City of Helena WWTP (Appendix I., Volume II, Final Report, August 2006). The phased approach is proposed in recognition of the fact that the permittee has committed significant amounts of money to upgrade and operate the facility and that further upgrades to reduce nutrient loading may pose both financial and technical challenges.

The TMDL three-phased approach is summarized as follows. Phase I is described as the voluntary "No Increase" phase for the Helena WWTP for TN and TP (Appendix I., Volume II, Final Report, August 2006). Phase I proposes adherence to the current WWTP performance at current daily flow rates for this permit cycle.

Phase I TMDL-proposed action items are:

- An ambient water quality monitoring program for Prickly Pear Creek,
- A Facility Optimization Study to define the maximum extent that nutrient concentrations/loads can be reduced given current facility infrastructure and available funding, and
- A Feasibility Study/Alternatives Analysis (FS/AA) to determine if, and how, the nutrient targets presented in the TMDL can be met. The FS/AA should consider both technical and economic feasibility relative to in-plant alternatives (i.e., engineering solutions) and influent/effluent alternatives. Examples of the latter may include: alternative discharge points, agricultural reuse, land application, septic system sludge management, wetlands treatment, and any other methods that may reduce nutrient loading.

Phase II is the "Optimization" phase where WLA limits for TN and TP may be "based on the literature to determine what is considered attainable", with load limits based on design flows.

Phase II action items are:

- Implement enhanced level of treatment based on results of facility optimization study.
- Allowance for increased loading through trading (adaptive management; conceptual).

Phase III is "water quality-based", whereby WLA limits for TN and TP may be based on the best available data to meet instream interim nutrient targets; with load limits developed using the design flow of the facility. The TMDL adaptive management strategy allows for the modification of Phase III interim nutrient limits if deemed appropriate or necessary in the future. This would be accomplished through the rule-making process associated with the adoption of Montana nutrient standards and/or the adaptive management process, itself.

D. Mixing Zone

A mixing zone is an area where the effluent mixes with the receiving water and certain water quality standards may be exceeded [ARM 17.30.502(6)]. The Department must determine the applicability of currently granted mixing zones [ARM 17.30.505(1)]. Mixing zones allowed under a permit issued prior to April 29, 1993 will remain in effect unless there is evidence that previously allowed mixing zones will impair existing or anticipated uses [ARM 17.30.505(1)(c)]. Pollutant concentrations in the effluent must meet the applicable water quality standards at the end of pipe unless a mixing zone is recognized by the Department for that specific parameter in the permit.

In accordance with ARM 17.30.507(1)(b), acute water quality standards for aquatic life may not be exceeded in any portion of the mixing zone unless the Department finds that allowing minimal initial dilution will not threaten or impair existing uses. The discharge must also comply with the general prohibitions of ARM 17.30.637(1) which require that state waters, including mixing zones, must be free from substances which will:

a. settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;

b. create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials;

c. produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;

d. create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and

e. create conditions which produce undesirable aquatic life.

Although certain standards may be exceeded in the mixing zone, an effluent in its mixing zone may not block passage of aquatic organisms nor may it cause acutely toxic conditions [ARM 17.30.602(16)]. No mixing zone will be granted that will impair beneficial uses [ARM 17.30.506(1)]. Aquatic life-chronic, aquatic life-acute and human health standards may not be exceeded outside of the mixing zone [ARM 17.30.507(1)(a)].

A standard mixing zone may be granted for facilities which discharge less than 1 mgd or when mixing is nearly instantaneous [ARM 17.30.516(3)(d)]. Nearly instantaneous mixing is assumed if the discharge is through an effluent diffuser, when the mean daily flow exceeds the 7-day, 10-year low flow (dilution ratio <1) or the permittee demonstrates through a Department approved study plan that the discharge is nearly instantaneous. A nearly instantaneous mixing zone may not extend downstream more than two (2) river widths.

Effluent discharges which do not qualify for a standard mixing zone must apply for a source specific mixing zone in accordance with ARM 17.30.518 and must conform to the requirements of 75-5-301(4), MCA which states that mixing zones must be the smallest practicable size; have minimal effects on uses; and, have definable boundaries. ARM 17.30.515(2) states that a person

applying for a mixing zone must indicate the type of mixing zone and provide sufficient detail for the Department to make a determination regarding the authorization of the mixing zone under the rules of Subchapter 5.

Review of the administrative file shows that the Department defined the mixing zone in the 1996-issued permit as nearly instantaneous because the discharge flow of 8.35 cfs is larger than the instream low flow criterion of zero cfs. This permit renewal will maintain the nearly instantaneous mixing zone. Effluent limitations developed will apply to the discharge at the end-of-pipe.

Compliance and monitoring will apply at the last point of control, the effluent weir before discharge to the effluent ditch rather than at the confluence of the discharge ditch and PPC. Because the confluence with PPC is on private property and difficult to access during the winter months, this compliance/monitoring point will facilitate timely, accessible, and safe monitoring and sampling of the effluent for compliance purposes.

E. Basis and Proposed WQBELs

Parameters typically present in municipal wastewater that may cause or contribute to a violation of water quality standards include the conventional pollutants such as, biological material (as measured by BOD_5), suspended solids, oil & grease, pathogenic bacteria, and pH; the non-conventional pollutants such as total residual chlorine, total ammonia as N, TN, and TP; and the carcinogenic and toxic pollutants such as volatile organic carbon substances and metals which can include, but is not limited to, aluminum, antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc.

ARM 17.30.1345 requires WQBELs to be developed for any pollutant for which there is reasonable potential (RP) for discharges to cause or contribute to exceedences of instream numeric or narrative water quality standards. RP calculations utilize the receiving water concentration, the maximum projected effluent concentration, the design flow of the wastewater treatment facility, and the applicable receiving water flow.

The Department uses a mass balance equation to determine RP (*Equation 1*).

$$C_{RP} = \frac{C_E Q_E + C_S Q_S}{Q_E + Q_S} \qquad \textit{(Eq. 1)}$$

Where:

C_{RP} = receiving water concentration (RWC) after mixing, mg/L
C_E = maximum projected effluent concentration, mg/L
C_S = RWC upstream of discharge, mg/L
Q_S = applicable receiving water flow, mgd
Q_E = facility design flow rate, mgd

The Department is proposing effluent limits for pollutants with RP for which adequate data exists.

1. Conventional Pollutants

TSS and BOD_5: The facility provides a significant reduction in biological material and solids through secondary treatment (Section III). No additional WQBELs will be required for these parameters.

Oil and Grease (O&G): ARM 17.30.637 (1) identifies general prohibitions to municipal discharges. State surface waters must be free from substances attributable to municipal discharges that will create a visible oil film, or be present at or in excess of 10 mg/L. A numeric limitation for O&G was applied in the previous permit cycle as an instantaneous maximum value of 15 mg/L; however, no effluent monitoring or reporting was required. The narrative limitation prohibiting visible oil sheen in the receiving water [ARM 17.30.637(b)] was implemented. To adhere to ARM 17.30.637(1), the standard of <10 mg/L as a maximum daily limitation will be applied to discharges from Outfall 001 with this permit renewal. Monitoring of the effluent shall be required.

***Escherichia coli* Bacteria:** The Montana state standards for *Escherichia coli* (*E. coli*) bacteria replaced fecal coliform bacteria effective February 1, 2006. The applicable standards for *E. coli* are:

a. April 1 through October 31, of each year, the geometric mean number of the microbial species *E. coli* must not exceed 126 colony forming units (cfu) per 100 milliliters (mL), nor are 10% of the total samples during any 30-day period to exceed 252 cfu per 100 mL [ARM 17.30.628(2)(a)(i)]; and

b. November 1 through March 31, of each year, the geometric mean number of *E. coli* shall not exceed 630 cfu per 100 mL and 10% of the samples during any 30-day period may not exceed 1,260 cfu per 100 mL [ARM 17.30.628(2)(a)(ii)].

The permit will incorporate the Montana state standards for *E. coli* bacteria. The Department is not granting a mixing zone for *E. coli* based on the following considerations: the potentially effluent-dominated nature of the receiving water (low flow criterion equal to zero) and ARM 17.30.637(1)(e) which requires that state waters must be free from substances that are harmful or toxic to humans. ARM 17.30.505(2) states that if the Department determines that a mixing zone may interfere with or threaten a beneficial use, discharge limitations will be modified and if necessary, require the applicable numeric water quality criteria to be met at the end of the discharge pipe.

2. Nonconventional Pollutants

Total Ammonia as N: Total ammonia as N limitations in the previous permit were based on variable conditions and available monthly in stream dilution. In accordance with 17.30.628(2)(j), the Department is proposing to revise the WQBEL for ammonia to be based on the design criteria given in 17.30.635(4) which requires the use of the 7Q10 stream flow.

Existing baseline data are used to estimate in-stream values for total ammonia as N, pH, and temperature which may be present in the receiving water at the design (critical) flow condition. The critical conditions for pH and temperature in the receiving water are taken to be the 75th percentiles of the baseline data. These values represent the upper bounds of the interquartile range (IQR) of the baseline data.

For a POTW, these criteria are established as the low flow condition of the receiving water, the critical combination of pH and temperature of the receiving stream for standard calculation in accordance with Circular DEQ-7, the critical discharge concentration, the presence or absence of salmonid species, and the presence or absence of fish in early life stages. Salmonid fishes and their early life stages are presumed present year-round.

Table 6, presents the total ammonia as N water quality standards for PPC using the ambient water quality data in Table 5.

Table 6. Total Ammonia as N Water Quality Standards for PPC

Condition	Period	Salmonids Present	Early Life Stages Present	Ambient Condition		Water Quality Standard (1) (mg/L)
				pH	Temperature °C	
Acute	Annual	Yes	Yes	8.20 (2)	NA	1.67
Chronic	Annual	Yes	Yes	8.20 (2)	15.6 (2)	3.83

Footnotes: NA – Not Applicable
(1) 30-day average concentration, based on Department Circular DEQ-7 (February 2008)
(2) Based on 75th percentile of the data set.

To determine if the total ammonia as N concentrations in the effluent will contribute to or create an exceedence of the state acute standard in PPC, an RP analysis was completed using *Equation 1* (presented in Attachment A-1). The projected maximum effluent concentration for total ammonia as N was found following the method recommended by the EPA *Technical Support Document for Water Quality-based Toxics Control* (TSD, 1991).

A multiplier of 1.5 was determined using Table 3-2 in the TSD (given a coefficient of variation of 0.87 and a sample size of 59 at the 95% confidence interval). The maximum reported effluent total ammonia as N concentration for the dataset was 3.62 mg/L. The elevated concentration values known to be due to an upset condition at the POTW that affected the ammonia removal process were not used in this analysis. The projected maximum effluent concentration used in *Eq. 1.* is the multiplier times the maximum reported concentration (1.5*3.62 mg/L) = 5.43 mg/L.

The projected maximum concentration of 5.43 mg/L total ammonia as N exceeds the acute and chronic standards for total ammonia as N; therefore RP is shown to exist for this parameter and applicable limitations will be developed in this permit renewal. With no dilution flow available for mixing, the Average Weekly Limitation (AWL) is 3.83 mg/L and Average Monthly Limitation (AML) is 1.67 mg/L.

Nutrients (TN and TP): Currently there are no numeric water quality standards for TN and TP that apply to PPC. This does not allow for an RP assessment at this time. The actual nutrient loads discharged by the Helena WWTP are presented in Table 7.

Table 7. Effluent Nutrient Load over POR

Parameter	Units	2007	2008	2009	2010	2011
Total Nitrogen	lb/day	185	161	171	179	158
Total Phosphorus as P	lb/day	83	70	66	47	56

Pursuant to 75-5-703(6)(b), MCA, the Department is incorporating the applicable portions of Phase I and Phase II of the EPA-developed and approved TMDL as Interim Adaptive Management Waste Load allocations (IWLA) in this permit renewal (described in Section IV.C. of this Fact Sheet).

Lacking numeric water quality standards for TN and TP, IWLA are developed as average monthly and average weekly loads using the TSD and are based on the current plant flow and the performance of the WWTP. This approach uses the existing nutrient loads as obtained from the corrected DMRs for Outfall 001 over the POR. Elevated TN load values known to be due to upset conditions at the POTW that affected the biological nutrient removal process were not used in this analysis. IWLA calculations and results are presented in Attachment B-1.

The Average Weekly Load (AWLd) and Average Monthly Load (AMLd) were developed using the long term average of the data set and the long term average (LTA) multipliers for the 99th percentile based on the statistics of the data set (TSD, 1991). These IWLA take into account the variability of the effluent quality and will apply to the effluent prior to mixing with the WWTP effluent ditch at Outfall 001 (no mixing zone). The formulae used are as follows:

AWLd = LTA $e^{[2.326S - 0.5(S*S)]}$, use EPA TSD, Table 5-2 for 99th percentile,
AMLd = LTA $e^{[2.326S - 0.5(S*S)]}$, use EPA TSD, Table 5-2 for 99th percentile, n = 4

Table 8. Proposed Nutrient Interim Waste Load Allocations for Outfall 001

Parameter	Units	Load	
		Average Monthly (1)	Average Weekly (1)
Total Nitrogen (2)	lb/day	227	294
Total Phosphorus as P	lb/day	108	166

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) Calculated from the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen (TKN) concentrations.

The Department recognizes that these IWLA are part of the adaptive management TMDL phased wasteload allocation. As such, these IWLA are subject to change based on the on-going efforts on the part of the permittee, local watershed groups, the Department, and the EPA to address:

- point source/nonpoint source issues (effluent trading credits);

- the watershed approach to nutrient reductions (sewering failing domestic treatment systems);
- TMDL-driven alternatives analysis/feasibility studies; and
- the potential adoption of numeric water quality standards for TN and TP for the receiving water and the resultant variance process.

To address the first two bullet points above, the Department is proposing to allow nutrient trading under this permit to promote nonpoint source nutrient reductions within the Lake Helena watershed. Pursuant to MCA 75-5-703(2), the Lake Helena TMDL adaptive management strategy expressly allows effluent trading as a means to increase a point source wasteload allocation, provided that it results in an overall watershed scale nutrient load reduction (TMDL, Appendix I). The proposed trades under this permit will result in such a watershed scale nutrient reduction and is explained below.

Nutrient Trading

The purpose of the trading plan is to allow the City of Helena to extend its service area beyond the city limits, connecting city wastewater treatment services to homes in the surrounding area that are, or would normally be, served by individual or community septic systems. Connecting these systems to city services will provide improved treatment and reduce the loading of nutrients, specifically nitrogen, to the surface waters in that portion of the watershed within the Helena Wastewater Planning Area (see map, Attachment C-7).

The trading plan does allow trades to occur that will shift nutrient discharges from the Ten Mile and Silver Creek subwatersheds to the Prickly Pear Creek subwatershed. Based on the following points however, trading will not result in an increased nutrient load to Prickly Pear Creek over those that were discharged by the Helena WWTF at the time the TMDL was approved.

- The actual average nutrient loads discharged by the Helena WWTF, as reported on the facility DMRs, during the same POR used in development of the TMDL (June 2001 through January 2005) were 202 lb/day of TN and 148 lb/day of TP. These values are significantly higher than those for the most recent POR that were used in the calculation of the IWLAs shown in Table 8. Had the Department developed effluent limits based on the 2001 to 2005 TMDL POR, the limits would have been 269 lb/day TN and 250 lb/day TP as average monthly limits.

  This data shows that the Helena WWTF has significantly reduced nutrient discharge loads since the approval of the TMDL. The proposed effluent limits are based on this improved performance. The limited trading proposed below will not result in an increase above the 2006 levels.

- The proposed permit will allow for land application and reuse of a portion of the facility effluent during the growing season; further reducing nitrogen loading to Prickly Pear Creek. As of April 2011, the facility is approved to reuse approximately 2-7 million gallons of treated effluent per irrigation season. The permit will allow for the expansion of the land application/reuse area, pending Department design approval.

To develop the trading plan, the Department determined the amount of credit (or offset) that will be applied to the city's effluent limits. The method used to make this determination is described below.

The location of each septic system in the Helena Wastewater Planning Area was estimated by creating a GIS-coverage by plotting points in the centroid of every land parcel that is identified as "dwelling" or "mobile" in the Montana cadastral database. This coverage was then edited by removing all points that are located within the cities of Helena and East Helena WWTPs service area based on the assumption that no residential property within the service area of the WWTP uses a septic system.

For the purpose of estimating average nutrient reductions within the planning area it was not necessary to distinguish single-family septic systems from multi-family systems. Only the location and distribution of septic systems is important in the analysis because the method calculates percent reductions of nutrients and thus is not sensitive to the load of wastewater (wastewater load is needed for the final step of the process to determine the load credit for connecting specific septic systems to the treatment plant). As residential systems comprise the vast majority of septic systems in the planning area it was not necessary to locate commercial septic systems for the analysis.

After the septic locations were determined a spreadsheet approach, Method for Estimating Attenuation of Nutrients from Septic Systems (MEANSS), was used for determining the reduction of nitrogen and phosphorus between disposal at the drainfield and subsequent discharge to surface water. The phosphorus analysis demonstrated that there is no available offset of phosphorus from septic system discharges as only a small fraction of the phosphorus in wastewater is estimated to discharge to surface waters and therefore is not discussed further. The nitrogen reduction method is described below, the results were used to determine the appropriate nitrogen offset which was then incorporated into the nitrogen effluent limits.

MEANSS is only designed for use on a larger basin-wide scale that effectively allows averaging of the wide variation of processes that occur in the subsurface between wastewater discharge in the vadose zone and subsequent migration into the surface water.

Nitrogen

MEANSS uses a matrix (Table 9) that is based on the three primary factors impacting the amount of nitrogen attenuation (via denitrification): soil type beneath the drainfield; soil type in the riparian area; and distance to surface water. In the matrix (Table 9) each drainfield is

assigned a percent denitrification factor for each of the three criteria. The percentages assigned for each column are then added to provide the total percent nitrogen removal for that septic system. The nitrogen loading rate (for example, 30.5 lbs/year for a conventional septic system) to the surface water is then reduced accordingly. Any system with a percent reduction of 100% or more is assumed to contribute no nitrogen to the surface water. This method assumes steady-state conditions exist in that it does not account for the time needed for the nitrogen load to migrate towards the receiving surface water. That lag time is dependent on the distance to the receiving water and the travel rate through both the vadose and saturated zones. MEANSS also does not account for in-stream nutrient cycling as the discharge moves downstream.

Table 9. MEANSS nitrogen loading matrix.

Percent Nitrogen Load Reduction[a]	Soil Type @ Drainfield[b]	Soil Type within 100' of surface water[b]	Distance to surface water (ft)
0	A	A	<=100
10	B		>100 - 500
20	C	B	>500 – 5,000
30	D	C	>5,000 - 20,000
50		D	>20,000

Notes:
a. The total nitrogen reduction is the sum of the individual reductions for each column of the table. For example, the nitrogen load reduction associated with a drainfield in a type C soil that drains to a surface water with type B soil, and is 200 feet from the nearest surface water would be 50% (i.e., 20% + 20% + 10% = 50% or 30.5 lbs/year * 0.5 = 15.25 lbs/year).
b. Soil drainage class:
A = excessively drained or somewhat excessively drained
B = well drained or moderately well drained
C = somewhat poorly drained
D = poorly drained or very poorly drained

The MEANSS approach was applied to each drainfield identified in the five subwatersheds in the Helena Wastewater Planning Area (planning area), and the average nitrogen reduction calculated for each. Based on the number of septic systems in each subwatershed, a weighted average percent reduction of 52% was calculated for the entire planning area (Attachment B-2).

Attachment B-2 shows the method used to arrive at the final trading credit for each subwatershed and the planning area weighted average. The calculations shown are based on a total nitrogen concentration of 50 mg/L, which is the Department's estimation of the nitrogen concentration discharged from the average conventional septic system serving a single-family home (Montana DEQ, 2009). To determine the portion of the total nitrogen concentration available for trading credit the Department used the average percent reduction from MEANSS (converted to a delivery ratio), the nitrogen concentration reaching surface water after applying the delivery and uncertainty ratios, and the City of Helena's effluent limits (converted from load to concentration). The final trading credit ratio is 3.88, meaning that for every 3.88 pounds of nitrogen that would have discharged from a drainfield one pound of credit is applied to the average monthly nitrogen limit in Table 8. Similarly, the trade ratio for the average weekly limit is 5.27.

The method shown in Attachment B-2 does not use an uncertainty ratio to further reduce the trade allowance to account for uncertainty in the method. It is the Department's position that the conservative, watershed-scale assumptions employed by the MEANSS approach and the use of the WWTP's permit effluent limit, rather than the facility's actual discharge concentrations, make the use of an additional uncertainty ratio unnecessary.

To apply the trade ratio to the permit effluent limits the Department used the 50 mg/L of total nitrogen and 200 gallons per day estimates to calculate the daily load discharged from a typical septic system (Montana DEQ, 2009). This value is 0.0834 lbs of total nitrogen per day. Applying the trading credit ratios yields total credits of 0.021 lbs/day (average monthly) and 0.016 lbs/day (average weekly) for each connection to the Helena WWTF.

DEQ proposes to increase the Interim Adaptive Management Waste Load allocations (IWLA) for total nitrogen, based on the expected increase in domestic connections to the City of Helena WWTF, following the schedule in Table 10 below. For every 100 documented new domestic connections DEQ will add 2.0 lb/day (after rounding) to both the average monthly and average weekly permit limits for total nitrogen. Effluent limits may be modified once a year, on January 1st for no fewer than 100 new connections and no more than 200. Modified effluent limits will not take effect until the Department has reviewed and provided written approval of the additional domestic connections. The permittee must submit the request for modified permit limits and documentation of new connections by December 31st of each year. In order to receive credit for new connections they must be active, not planned or proposed, by the time of the request. DEQ's written approval shall include the modified effluent limits. Approved effluent limits will take effect retroactively to January 1st.

The proposed modifications to the IWLA are summarized below in Table 10.

Table 10. Trade-Adjusted Nutrient Interim Waste Load Allocations for Outfall 001

Parameter	Units	Load	
		Average Monthly (1)	Average Weekly (1)
Total Nitrogen (2,3)	lb/day	227	294
Total Nitrogen(2.4)	lb/day	227 – 231	294 – 298
Total Nitrogen(2.5)	lb/day	227 – 235	294 – 302
Total Nitrogen(2.6)	lb/day	227 – 239	294 – 306
Total Nitrogen(2,7)	lb/day	227 - 243	294 – 310
Total Phosphorus as P	lb/day	108	166

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) Calculated from the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen (TKN) concentrations.
(3) Effective from permit effective date through December 31, 2013.
(4) Effective January 1, 2014. See Fact Sheet
(5) Effective January 1, 2015. See Fact Sheet.
(6) Effective January 1, 2016. See Fact Sheet.
(7) Effective January 1, 2017. See Fact Sheet

In addition to the IWLA proposed above, and as part of the adaptive management phased WLA, the permittee will be required to conduct the facility optimization study from Phase I of the TMDL. Nutrient concentrations and resulting loads from the optimization study will be incorporated into the next permit renewal as effluent limits. The limits will be based on the optimization study-derived concentrations and the plant design flow. In no case will the new effluent limits result in TN and TP load limits greater than the IWLA proposed above. Upon completion of the optimization study the permittee will be required to develop and submit a plan for attaining the optimized effluent concentrations for TN and TP. Between the submission of this plan and the next permit renewal, the permittee will submit annual reports documenting progress towards attaining the optimized effluent concentrations. See Part VIII, Special Conditions for additional detail and compliance dates.

Dissolved Oxygen (DO): Low DO levels can be a typical pollutant of concern for POTWs. Freshwater aquatic life standards are specific to the fishes (cold- or warm-water) present and by the presence or absence of fish in early life stages (Circular DEQ-7, February 2008); they are presented in Table 9, below. Standards are further defined based on a specific period of time and required in-stream DO levels. DO levels in PPC have been monitored by the permittee at in-stream sample points in previous permit cycles during the low-flow, high-temperature month of August. It was shown that DO minima met the in-stream standards for that particular month.

The effluent is transported over one mile through the open effluent discharge ditch to the confluence with PPC. It is anticipated that DO may be enhanced in the effluent through the presence of built-in cascades after the effluent weir at the head of the effluent ditch and throughout the one-mile length of the ditch. No limitation for DO is necessary in this permit cycle. However, to allow for a year-round RP assessment during the next permit renewal, a two-year DO monitoring study will be required as a special condition to characterize the DO interaction of the effluent and the receiving water.

Table 9. DO Standards For Waters Classified as "I" (Circular DEQ-7).

Condition	30-Day Mean (mg/L)	7-Day Mean (mg/L)	7-Day Mean Minimum (mg/L)	1-Day Minimum (1) (mg/L)
Early Life Stages (2)	NA (3)	6.0	NA (3)	5.0
Other Life Stages	5.5	NA (3)	4.0	3.0

Footnotes:
(1) All minima should be considered as instantaneous concentrations to be achieved at all times.
(2) Includes all embryonic and larval stages and all juvenile forms of fish to 30-days following hatching.
(3) NA = Not Applicable

Total Residual Chlorine (TRC): At present, the permittee utilizes UV disinfection rather than chlorination. TRC monitoring and limits are not proposed in this renewal. Any future discharge of

TRC will require an updated MPDES application and permit modification prior to the use of chlorine.

pH: Pursuant to ARM 17.30.628(2)(c), the induced variation of hydrogen ion concentration within the range of 6.5 to 9.5 must be less than 0.5 pH units. Natural pH outside this range must be maintained without change. Natural pH above 7.0 must be maintained above 7.0. The TBEL for pH requires effluent pH to be maintained between 6.0 and 9.0 s.u. To assure both the WQBEL and TBEL for pH in the effluent is met, the pH range will be maintained between 6.5 and 9.0 s.u.

Temperature: Temperature standards for I class streams are stated in ARM 17.30.628(2)(e), no increase in naturally occurring temperature is allowed which will or is likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife. Effluent temperature has not been monitored in previous permit cycles and the data are lacking to conduct an RP analysis. Due to the length of the effluent ditch (over one mile), it is likely that the effluent temperatures will approach ambient levels as measured in PPC. However, monitoring of the effluent for temperature will be required in this permit renewal to allow for an RP assessment in the next permit renewal.

3. Toxic Pollutants

ARM 17.30.628(2)(h) states that concentrations of toxic, carcinogenic, or harmful parameters may not commence or continue which lower, or are likely to lower, the overall water quality of these waters.

Metals - All metals discussions refer to the metals in their "total recoverable" fraction with the exception of aluminum which is regulated and monitored in the dissolved form. In previous permit cycles, no assessment for metals in the effluent has been conducted due to the "I" classification of PPC. However, the 1996 and 2008 303(d) lists both indicate that the stream is impaired for metals and, as such, limitations must be assessed for discharge to continue. Specifically, the stream is listed as impaired for aluminum, antimony, arsenic, cadmium, copper, lead, and zinc.

The Permittee has collected effluent data for total recoverable metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) in support of the IPP (see Table 2). However, some of these data did not meet Department Required Reporting Values (RRV), specifically cadmium, lead, mercury, silver, and zinc.

The RRV is the detection level that must be achieved in reporting surface water monitoring or compliance data to the Department as listed in Circular DEQ-7 (February 2008). The RRV is the Department's best determination of a level of analysis that can be achieved by the majority of the commercial, university, or governmental laboratories using EPA-approved methods or methods approved by the Department.

In-stream metals data are presented in Table 5 for the seven metals of concern; only one data point is available for both aluminum and antimony. Applicable PPC aquatic life and human health surface water standards for the seven listed metals are summarized in Table 10. These standards are calculated using the 25th percentile value for the upstream total hardness data set, 91 mg/L as $CaCO_3$). The 25th percentile, low hardness condition is used to be protective of the receiving water year-round.

Table 10. PPC Metals Surface Water Standards (Circular DEQ-7, February 2008)

Parameter	Units	Required Reporting Value (RRV)	Human Health Standard	Aquatic Life Standard (1)	
				Acute	Chronic
Aluminum (Dissolved)	mg/L	0.030	--	0.750	0.087
Antimony, Total Recoverable	mg/L	0.003	0.0056	--	--
Arsenic, Total Recoverable	mg/L	0.003	0.010	0.34	0.15
Cadmium, Total Recoverable	mg/L	0.00008	0.005	0.0019	0.0003
Copper, Total Recoverable	mg/L	0.001	1.30	0.0128	0.0086
Lead, Total Recoverable	mg/L	0.0005	0.015	0.0724	0.0028
Zinc, Total Recoverable	mg/L	0.010	2.00	0.111	0.111

Footnotes:
(1) Applicable metals standards calculated using the 25th percentile upstream total hardness value of 91 mg/L as $CaCO_3$

Where data are sufficient, RP will be assessed.

- There are no effluent data available for dissolved aluminum; an RP assessment cannot be conducted at this time. Monitoring of the effluent at the RRV will be required to allow for an RP assessment during the next permit renewal.

- For antimony, the human health standard of 0.0056 mg/L is the most protective of the in-stream standards. An RP assessment is presented in Attachment C-1. RP is not shown to exist for this parameter and no effluent limitation is required.
- For arsenic, the human health standard of 0.010 mg/L is the most protective of the in-stream standards. An RP assessment is presented in Attachment C-2. RP is not shown to exist for this parameter and no effluent limitation is required.

- For cadmium, effluent data do not meet the RRV for this parameter, as a result it is feasible that cadmium is present at lower levels than those reported and the level of detection of the analysis may falsely drive RP for the chronic condition as potentially seen in Attachment C-3. Due to the unavailability of data reported at the required level of sensitivity, no limitation for cadmium will be developed during this permit cycle. Monitoring of the effluent at the RRV will be required to allow for an RP assessment during the next permit renewal.

- For copper, an RP assessment is presented in Attachment C-4. The projected maximum concentration of 0.1044 mg/L exceeds both the acute and chronic standards for copper; RP is shown to exist for this parameter and applicable limitations will be developed in this permit

renewal. With no dilution flow available for mixing, the AML is 0.0086 mg/L and the MDL is 0.0128 mg/L.

- For lead, effluent data do not meet the RRV for this parameter, as a result it is feasible that lead is present at lower levels than those reported and the level of detection of the analysis may falsely drive RP for the chronic condition as potentially seen in Attachment C-5. Therefore, no limitation for lead will be developed during this permit cycle. Monitoring of the effluent at the RRV will be required to allow for an RP assessment during the next permit renewal.

- For zinc, an RP assessment is presented in Attachment C-6. The projected maximum concentration of 0.242 mg/L exceeds both the acute and chronic standards for zinc; therefore RP is shown to exist for this parameter and applicable limitations will be developed in this permit renewal. With no dilution flow available for mixing, the AML is 0.111 mg/L and the MDL is 0.111 mg/L.

- Monitoring of the influent and effluent at the RRV for the other total recoverable metals from Table III, 40 CFR Part 122 Appendix D (beryllium, chromium, mercury, selenium, silver, thallium) will be required in support of the IPP and to allow for an RP assessment during the next permit renewal.

- Monitoring of the effluent for total hardness as mg/L $CaCO_3$ will be required in support of the IPP.

Total Phenols and Total Cyanide: Monitoring of the influent and effluent at the RRV for these two other toxic pollutants from Table III, 40 CFR Part 122 Appendix D will be required in support of the IPP. Monitoring of the effluent at the RRV will be required to allow for an RP assessment during the next permit renewal.

Organic Toxic Pollutants: As a facility with an EPA-required pretreatment program, the permittee was required to submit at least three sets of effluent organic toxic pollutants data (Table II, 40 CFR 122 Appendix D) with the renewal application (Part D. of EPA application Form 2A). These data have not been submitted to the Department. There is a lack of information available to perform an RP assessment. As a facility with a design flow of greater than 5 mgd and lacking historic organic toxic pollutant data from which to characterize the effluent quality, monitoring of the influent and effluent for the organic toxic pollutants in Table II, 40 CFR 122 Appendix D (volatile organic pollutants, acid compounds, and base/neutral compounds) to support the IPP and the renewal process will be required for the duration of the permit cycle.

Whole Effluent Toxicity (WET) Testing: ARM 17.30.637(1)(d) requires that state water be free from substances attributable to municipal waste that create conditions which are harmful or toxic to human, animal, plant or aquatic life, except the Department may allow limited toxicity in a mixing zone provided that there is no acute lethality to organisms. The previous permit

required chronic WET testing on two species due to the effluent dominated nature of the receiving water.

The permittee will be required to continue monitoring potential toxicity in the effluent by means of quarterly chronic WET testing on two species, in accordance with the EPA Region VIII NPDES *Whole Effluent Toxics Control Program*, August 1997, ARM 17.30.1322(6)(j), and the permit due to the nature of the discharge (no dilution flow for mixing) and the presence of an EPA-required Industrial Pretreatment Program.

V. Effluent Limitations

The proposed final effluent limitations are a combination of the more stringent of the nondegradation, technology-based, TMDL-developed WLA, and water quality-based effluent limitations as developed in Sections III and IV.

Outfall 001

Interim Limitations
The following interim effluent limitations will be applied to the discharge at Outfall 001 on the effective date of the permit and remain in effect through the 59th month of the 5 year permit cycle.

Table 11. Outfall 001 Interim Limitations

Parameter	Units	Average Monthly Limitation (1)	Average Weekly Limitation (1)	Maximum Daily Limitation (1)
BOD_5	mg/L	30	45	--
	lb/day	1,351	2,027	--
TSS	mg/L	30	45	--
	lb/day	1,351	2,027	--
E. coli Bacteria (2)	cfu/100 mL	126	252	--
E. coli Bacteria (3)	cfu/100 mL	630	1,260	--
Oil and Grease	mg/L	--	--	<10
Total Ammonia as N	mg/L	1.67	3.83	--
Total Nitrogen (4, 5, 6)	lb/day	227	294	--
Total Nitrogen (4, 5, 7)	lb/day	229	296	--
Total Nitrogen (4, 5, 8)	lb/day	231	298	--
Total Phosphorus as P Load (5)	lb/day	108	166	--

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) This limitation applies during the period April 1 through October 31.
(3) This limitation applies during the period November 1 through March 31.
(4) Calculated as the sum of Total Kjeldahl Nitrogen (TKN) and nitrate plus nitrite as N concentrations.
(5) Interim adaptive management Waste Load Allocations
(6) Effective from permit effective date through December 31, 2014.
(7) Effective January 1, 2015. These limits will not take effect until proper documentation of 100 additional domestic connections is received and approved by the Department.
(8) Effective January 1, 2017. These limits will not take effect until proper documentation of 100 additional domestic connections is received and approved by the Department, as detailed in the Fact Sheet.

pH: Effluent pH from Outfall 001 shall remain between 6.5 and 9.0 standard units (instantaneous minimum and instantaneous maximum). For compliance purposes, any single analysis or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

85 Percent (%) Removal Requirement for TSS and BOD_5: The arithmetic mean of the BOD_5 and TSS and for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on BOD_5 and TSS.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

Final Limitations

The following final effluent limitations will be applied to the discharge at Outfall 001 beginning the last calendar month of the permit cycle and will remain in effect through the duration of the permit.

Table 12. Outfall 001 Final Limitations and Interim Waste Load Allocations

Parameter	Units	Average Monthly Limitation (1)	Average Weekly Limitation (1)	Maximum Daily Limitation (1)
BOD_5	mg/L	30	45	--
	lb/day	1,351	2,027	--
TSS	mg/L	30	45	--
	lb/day	1,351	2,027	--
E. coli Bacteria (2)	cfu/100 mL	126	252	--
E. coli Bacteria (3)	cfu/100 mL	630	1,260	--
Oil and Grease	mg/L	--	--	<10
Total Ammonia as N	mg/L	1.67	3.83	--
Total Nitrogen (4, 5, 6)	lb/day	227	294	
Total Nitrogen (4, 5, 7)	lb/day	229	296	
Total Nitrogen (4, 5, 8)	lb/day	231	298	
Total Phosphorus as P (5)	lb/day	108	166	
Copper, Total Recoverable	mg/L	0.009	--	0.013
Zinc, Total Recoverable	mg/L	0.11		0.11

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) This limitation applies during the period April 1 through October 31.
(3) This limitation applies during the period November 1 through March 31.
(4) Calculated as the sum of Total Kjeldahl Nitrogen (TKN) and nitrate plus nitrite as N concentrations.
(5) Interim adaptive management Waste Load Allocations.
(6) Effective from permit effective date through December 31, 2014.
(7) Effective January 1, 2015. These limits will not take effect until proper documentation of 100 additional domestic connections is received and approved by the Department.
(8) Effective January 1, 2017. These limits will not take effect until proper documentation of 100 additional domestic connections is received and approved by the Department, as detailed in the Fact Sheet.

pH: Effluent pH from Outfall 001 shall remain between 6.5 and 9.0 standard units (instantaneous minimum and instantaneous maximum). For compliance purposes, any single analysis or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

85 Percent (%) Removal Requirement for TSS and BOD_5: The arithmetic mean of the BOD_5 and TSS and for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on BOD_5 and TSS.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

VI. Self-Monitoring Requirements

A. Monitoring and Reporting

As a minimum, the following constituents shall be monitored in the influent and effluent at the frequencies and with the types of measurements indicated. Self-monitoring requirements are summarized in Table 13. Additional effluent self-monitoring requirements can be found in Table 14. Monitoring frequencies are established to assess compliance with daily, weekly and monthly effluent limitations and for an activated sludge treatment system with an IPP and short retention times (design approximately 20 hours).

Samples or measurements shall be representative of the volume and nature of the monitored discharge. Samples shall be collected, preserved and analyzed at the RRV in accordance with approved procedures listed in 40 CFR 136. The RRV is the detection level that must be achieved in reporting surface water monitoring or compliance data to the Department (Circular DEQ-7, February 2008). The RRV is the Department's best determination of a level of analysis that can be achieved by the majority of the commercial, university, or governmental laboratories using EPA-approved methods or methods approved by the Department.

Influent flow is measured with a Parshall flume (primary device) and ultrasonic meter (secondary device). In order to be representative of the nature and volume of the flow being monitored, influent sample collection and flow monitoring must occur prior to equalization or any recycle flow returns. Effluent flow monitoring occurs post UV disinfection system at a Cipolletti weir and staff gauge with an ultrasonic meter secondary device. The permittee shall monitor the discharge from Outfall 001 at the last point of control following treatment (post UV disinfection system) prior to entering the effluent ditch.

TSS and BOD_5: Monitoring of both the influent and effluent for TSS and BOD_5 will be required by 24-hour flow-proportional composite samples five days per week. Reporting of the influent and effluent TSS and BOD_5 monthly averages and maximum weekly concentrations and

loads is required to assess compliance with monthly and weekly limitations, including percent removal criteria.

Oil and Grease (O&G): Monitoring of the effluent for O&G will be required by grab sample once per month. Reporting of the maximum daily concentration is required to assess compliance with limitations.

***Escherichia coli* (*E. coli*) Bacteria:** Monitoring of the effluent for *E. coli* bacteria will be required by grab sample five days per week. Reporting monthly geometric mean and maximum weekly geometric mean *E. coli* bacteria numbers is required to assess compliance with monthly and weekly limitations.

Total Ammonia as N: Monitoring of the effluent for total ammonia as N will be required by 24-hour flow-proportional composite samples once per week. Reporting of the effluent total ammonia as N monthly average and maximum weekly average concentrations is required to assess compliance with monthly and weekly limitations.

Nutrients (TN and TP): Monitoring of the effluent for TN (calculated as the sum of nitrite plus nitrate as N and Total Kjeldahl Nitrogen concentrations) and TP will be required by 24-hour flow-proportional composite samples once per week. Reporting of the effluent TN and TP average monthly and maximum weekly average concentrations and loads will be required in this permit renewal to assess compliance with monthly and weekly limitations.

Dissolved Oxygen (DO): Monitoring of the effluent will be required by grab sample (field reading acceptable) on a daily basis. Reporting of the effluent monthly average and daily minimum DO concentrations will be required in this permit renewal to allow for assessment of RP in future permit cycles.

pH: pH of the effluent will be monitored on a daily basis. Reporting of the instantaneous maximum and instantaneous minimum values measured during the month is required to assess compliance with the limitations.

Temperature: Temperature of the effluent will be monitored on a daily basis. Reporting of the instantaneous maximum and instantaneous minimum values measured during the month on the DMR is required to allow for RP assessment in future permit cycles.

Metals - All metals discussions refer to the metals in their "total recoverable" fraction with the exception of aluminum which is regulated and monitored in the dissolved form.

- For aluminum, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required due to the PPC impairment listing for aluminum, in support of the IPP, and to allow for an RP assessment in the next permit cycle. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For antimony, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required due to the PPC impairment listing for antimony and in support of the IPP. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For arsenic, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required due to the PPC impairment listing for arsenic and in support of the IPP. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For cadmium, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required due to the PPC impairment listing for cadmium, in support of the IPP, and to allow for an RP assessment in the next permit cycle. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For copper, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required in support of the IPP and to assess compliance with the limitations. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For lead, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required due to the PPC impairment listing for lead, in support of the IPP, and to allow for an RP assessment in the next permit cycle. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For zinc, monthly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required in support of the IPP and to assess compliance with the limitations. The permittee shall report the monthly average and maximum daily concentrations on the DMR;

- For the other total recoverable metals from Table III, 40 CFR Part 122 Appendix D (beryllium, chromium, mercury, selenium, silver, thallium), quarterly monitoring of the influent and effluent by 24-hour flow-proportional composite samples at the RRV will be required in support of the IPP. The permittee shall report the quarterly average and maximum daily concentrations on the DMR;

- For total hardness as $CaCO_3$, quarterly monitoring of the effluent by grab sample at the RRV will be required in support of the IPP. The permittee shall report the quarterly average and maximum daily concentrations on the DMR.

Total Phenols and Total Cyanide: Monitoring of the influent and effluent by grab sample at the RRV will be required for these toxic pollutants from Table III, 40 CFR Part 122 Appendix D will be required in support of the IPP and to allow for an RP assessment during the next permit

renewal. The permittee shall report the quarterly average and maximum daily concentrations on the DMR.

Organic Toxic Pollutants: Monitoring of the influent and effluent on a semi-annual basis for the volatile, acid, and base/neutral organic toxic pollutants in Table II, 40 CFR 122 Appendix D, by the sample method appropriate for the analysis will be required in support of the IPP and to allow for an RP assessment in the next permit cycle. Analysis results must meet the RRV or minimum level as determined by the analysis method.
Starting the first full calendar quarter after the effective date of the permit (January 1, 2011 through March 31, 2011) and lasting through midnight, December 31, 2013, the first semi-annual samples shall be collected in the first calendar quarter of the year (the months of January, February, or March); the second semi-annual samples shall be collected in the third calendar quarter of the year (July, August, or September). The analysis results will not be submitted on a DMR; instead, complete laboratory analysis reports shall be submitted with the applicable DMR for the reporting period.

Effective January 1, 2014, and lasting through the term of the permit, the first semi-annual samples shall be collected in the second calendar quarter of the year (during the months of April, May, or June); the second semi-annual samples shall be collected in the fourth calendar quarter of the year (October, November, or December). The analysis results will not be submitted on a DMR; instead, complete laboratory analysis reports shall be submitted with the applicable DMR for the reporting period.

Whole Effluent Toxicity (WET) Testing: Monitoring potential toxicity in the effluent by means of quarterly chronic WET testing on two species, in accordance with the EPA Region VIII NPDES *Whole Effluent Toxics Control Program*, August 1997, ARM 17.30.1322(6)(j), and the permit will be required . Complete laboratory analysis reports shall be submitted with the applicable DMR for the reporting period.

Table 13. Self-Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type (1)	RRV
Flow	mgd	Influent	Continuous	(2)	--
	mgd	Effluent	Continuous	(2)	--
5-Day Biochemical Oxygen Demand (BOD_5)	mg/L	Influent	5/Week	Composite	2
	mg/L	Effluent	5/Week	Composite	2
	lb/day	Effluent	1/Month	Calculated	--
	% Removal (3)	Effluent	1/Month	Calculated	--
Total Suspended Solids (TSS)	mg/L	Influent	5/Week	Composite	10
	mg/L	Effluent	5/Week	Composite	10
	lb/day	Effluent	1/Month	Calculated	--
	% Removal (3)	Effluent	1/Month	Calculated	--
pH	s.u.	Effluent	Daily	Instantaneous	0.1
Temperature	°C	Effluent	Daily	Instantaneous	--
E. coli Bacteria (4)	cfu/100 mL	Effluent	5/Week	Grab	1
Total Ammonia as N	mg/L	Effluent	1/Week	Composite	0.05
Nitrate + Nitrite as N	mg/L	Effluent	1/Week	Composite	0.01
Total Kjeldahl Nitrogen	mg/L	Effluent	1/Week	Composite	--
Total Nitrogen (5)	mg/L	Effluent	1/Week	Calculated	--
	lb/day	Effluent	1/Month	Calculated	--
Total Phosphorus as P	mg/L	Effluent	1/Week	Composite	0.001
	lb/day	Effluent	1/Month	Calculated	--
Dissolved Oxygen	mg/L	Effluent	Daily	Grab	0.05
Oil and Grease (6)	mg/L	Effluent	1/Month	Grab	1
Total Dissolved Solids	mg/L	Effluent	1/Quarter	Grab	10
Whole Effluent Toxicity, Chronic (7)	% Effluent	Effluent	1/Quarter	Composite	--

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) Requires recording device or totalizer; permittee shall report maximum daily and average monthly flow on DMR
(3) Percent Removal shall be calculated using the monthly average values
(4) Report Geometric Mean if more than one sample is collected during the reporting period.
(5) Calculated as the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen (TKN) concentrations.
(6) Collect a sample and analyze using EPA Method 1664 Revision A: N-Hexane Extractable Material (HEM).
(7) Sampling is required starting the first full calendar quarter following the effective date of the permit.

Table 14. Additional Monitoring Requirements

Parameter	Units	Sample Frequency	Sample Type (1)	RRV
Aluminum, Dissolved (2)	mg/L	1/Month	Composite	0.030
Antimony, Total Recoverable (2)	mg/L	1/Month	Composite	0.003
Arsenic, Total Recoverable (2)	mg/L	1/Month	Composite	0.003
Cadmium, Total Recoverable (2)	mg/L	1/Month	Composite	0.00008
Copper, Total Recoverable (2)	mg/L	1/Month	Composite	0.001
Lead, Total Recoverable (2)	mg/L	1/Month	Composite	0.0005
Zinc, Total Recoverable(2)	mg/L	1/Month	Composite	0.010
Beryllium, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.001
Chromium, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.001
Mercury, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.00001
Nickel, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.010
Selenium, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.001
Silver, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.0005
Thallium, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.0002
Cyanide, Total (3)	mg/L	1/Quarter	Grab	0.005
Phenols, Total (3)	mg/L	1/Quarter	Grab	0.010
Total Hardness as $CaCO_3$ (3)	mg/L	1/Quarter	Composite	10
Volatile Organic Pollutants (4)	mg/L	2/year	Composite	(5)
Semi-Volatile, Acid Compounds (4)	mg/L	2/year	Composite	(5)
Semi-Volatile, Base/Neutral (4)	mg/L	2/year	Composite	(5)

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) Both influent and effluent shall be sampled. Metals shall be analyzed as total recoverable with the exception of aluminum, which is analyzed in the dissolved form. Use EPA Method (Section) 4.1.4 [EPA 600/4-79-020, March 1983] or equivalent.
(3) Effluent sample only.
(4) Both influent and effluent shall be sampled in accordance with 40 CFR 122, Appendix D, Table II. Analysis results will not be submitted on a DMR; complete laboratory analysis reports shall be submitted with the applicable DMR for the reporting period.

Starting the first full calendar quarter after the effective date of the permit (January 1, 2011 through March 31, 2011) and lasting through midnight, December 31, 2013, the first semi-annual influent and effluent samples shall be collected in the first calendar quarter of the year (the months of January, February, or March); the second semi-annual influent and effluent samples shall be collected in the third calendar quarter of the year (July, August, or September).

Effective January 1, 2014, and lasting through the term of the permit, the first semi-annual influent and effluent samples shall be collected in the second calendar quarter of the year (during the months of April, May, or June); the second semi-annual influent and effluent samples shall be collected in the fourth calendar quarter of the year (October, November, or December). Results will not be entered on a DMR but shall be submitted with the next quarter's DMR

when due.
(5) See approved method for minimum level.

VII. Nonsignificance Determination

As discussed in the previous sections, the proposed effluent limits and discharge flows for the Helena WWTP discharge do not allow for, or constitute, a new or increased source of pollutants pursuant to ARM 17.30.702(18). Therefore, a nonsignificance analysis is not required [ARM 17.30.705(1)].

VIII. Special Conditions

Copper and Zinc - Final effluent limitations for total recoverable copper and total recoverable zinc are effective xx/xx/xxxx (59 months after permit effective date). The permittee is being given time to optimize treatment in order to meet the new water quality-based effluent limitations for total recoverable metals.

1. Starting the first full calendar year of the permit cycle (2012) and lasting for the duration of the Special Condition, an annual report shall be submitted to the Department with the December DMR (postmarked no later than January 28th). The reports shall describe the milestones accomplished and the steps planned for each year towards compliance with the final effluent limitations for total recoverable copper and total recoverable zinc.

Facility Optimization Study for TN and TP – The permittee shall conduct a facility optimization study to improve treatment efficiency for TN and TP and submit a plan for achieving optimization by the expiration date of the permit. Effluent limits will be developed from the optimization study as previously described and will be applied in the next permit renewal. The permittee shall adhere to the following schedule with respect to optimization:

2. The facility optimization study shall be completed and submitted to the Department no later than 1 year after the effective date of the permit. The study must identify the long term average (LTA) concentrations of TN and TP achievable by the facility in its present configuration. Effluent load limits for TN and TP will be developed based on these LTA and the design flow of the facility following the method used to develop the IWLA in this

permit. The smaller of either the optimization-based load limits or the IWLA in this permit will be incorporated into the next permit renewal as effluent limits for TN and TP.

3. No later than two years after the permit effective date, the permittee must submit a plan for implementing the optimization study and achieving the effluent concentrations and load limits described above. The plan must include achievement of these effluent limits no later than the expiration date of this permit.

4. At the end of each calendar year following the submission of the above plan, the permittee shall submit an annual report describing progress made towards implementation of the optimization study and compliance with the effluent limits described above. Progress reports for the previous year shall be submitted and postmarked no later than January 28th.

Land Application/reuse of treated effluent – Upon Department review and approval of plans and specifications, the permittee may commence land application/irrigation with treated effluent. This authorization applies to the irrigation of facility grounds only and adjacent public property only. Any other land application of treated effluent will require the submission of an updated permit application, including DEQ Form LA-1.

As of April 2011, the permittee is authorized for land application/reuse of treated effluent on the facility grounds. Any additional land application on adjacent public property must undergo paln and specification review and approval by the Department. Once the plan and specification approval is granted, the permittee must submit a letter to the Water Protection Bureau indicating the planned date for the commencement of the additional irrigation and the anticipated volume of treated effluent that will be used for this purpose. The letter must be submitted prior to the use of effluent for irrigation, and no later than December 31, 2012.

IX. Other Information

On September 21, 2000, a US District Judge issued an order stating that until all necessary total maximum daily loads (TMDLs) under Section 303(d) of the Clean Water Act are established for a particular water quality-limited segment, the State is not to issue any new permits or increase permitted discharges under the MPDES program. The order was issued under the lawsuit Friends of the Wild Swan vs. US EPA, *et al.* , CV 97-35-M-DWM, District of Montana, Missoula Division.

The renewal of this permit does not conflict with Judge Molloy's order because the permit includes effluent limits that prohibit any increases above previously-allowed authorized amounts.

X. Information Sources

1. Administrative Rules of Montana Title 17 Chapter 30 - Water Quality
   a. Sub-Chapter 2 - *Water Quality Permit and Application Fees*, December 2009.
   b. Sub-Chapter 5 - *Mixing Zones in Surface and Ground Water*, March 2006.

c. Sub-Chapter 6 - *Montana Surface Water Quality Standards and Procedures*, March 2006.
d. Sub-Chapter 7- *Nondegradation of Water Quality*, March 2006.
e. Sub-Chapter 10 - *Montana Ground Water Pollution Control System,* June 2006.
f. Sub-Chapter 12 - *Montana Pollutant Discharge Elimination System (MPDES) Standards*, March 2007.
g. Sub-Chapter 13 - *Montana Pollutant Discharge Elimination System (MPDES) Permits*, June 2006.

2. Clean Water Act § 303(d), 33 USC 1313(d) *Montana List of Waterbodies in Need of Total Maximum Daily Load Development*, 1996 and 2008.

3. Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

4. Montana Code Annotated Title 75 - Environmental Protection Chapter 5 - Water Quality, 2007.
5. Montana DEQ. 2009. *How to Perform a Nondegradation Analysis for Subsurface Wastewater Treatment Systems (SWTS) Under the Subdivision Review Process.*

6. Montana Department of Environmental Quality Circular DEQ-2, *Design Standards for Wastewater Facilities,* September 1999.

7. Montana Department of Environmental Quality Circular DEQ-7, *Montana Numeric Water Quality Standards*, February 2008.

8. Montana Department of Fish Wildlife and Parks, *Spawning Times of Montana Fishes*, March 2001.

9. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0022641
   1. Administrative Record.
   2. Renewal Application Forms DEQ-1 and EPA Form 2A, February 16, 2010.

10. *Wastewater Treatment Facility Operation and Maintenance Manual*, Helena, Montana, Black & Veatch, February 1977.

11. *City of Helena, Montana Proposed DEQ Discharge Permit Modifications Report*, Black & Veatch, July 1995.

12. *Operations Manual*, Helena WWTP, Morrison-Maierle, Inc., December 2000.

13. *City of Helena Wastewater Collection System Master Plan* (planning period 2005-2025), City of Helena, 2008.

14. US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

15. US Code of Federal Regulations, 40 CFR Part 403 – *General Pretreatment Regulations for Existing and New Sources of Pollution.*

16. US Code of Federal Regulations, 40 CFR Part 503 – *Standards for the Use or Disposal of Sewage Sludge.*

17. US Department of the Interior US Geological Survey, *Statistical Summaries of Streamflow in Montana and Adjacent Areas, Water Years 1900 through 2002*, Scientific Investigations Report 2004-5266, 2004.

18. US EPA *Technical Support Document for Water Quality-Based Toxics Control*, EPA/505/2-30-001, March 1991.

19. US EPA NPDES *Permit Writers' Manual*, EPA 833-B-96-003, December 1996.

20. US EPA Region VIII NPDES *Whole Effluent Toxics Control Program*, August 1997.

21. US EPA *NPDES Compliance Inspection Manual*, EPA 305-X-03-004, July 2004.

22. US EPA for Montana Department of Environmental Quality *Framework Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area:*
    a. Volume I – Appendices, December 2004.
    b. Volume II – Final Report, August 2006.

23. US EPA Ref. 8-MO, TMDL Approvals, *Lake Helena Total Maximum Daily Load Planning Area* and Enclosures, September 27, 2006.

24. US EPA *NPDES Permit Writers' Course Manual*, EPA-833-B-91-001, March 2009.

Prepared by: MK Valett, May 25, 2010
Jeff May, March 2012

Attachment A-1

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Ammonia as N						
	Variables	Units	Acute Condition		Chronic Condition	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350		8.350
C_d	Concentration in Discharge	mg/L	C_{99}	5.430	C_{99}	5.430
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0	0
C_s	Concentration in Stream	mg/L		0.39		0.39
C_r	**Concentration Down Stream**	**mg/L**		**5.43**		**5.43**
	Stream Standards	mg/L	CMC 1-h	1.67	CCC 30-d	3.83
RP				**yes**		**yes**
7Q10		cfs		0		
CV				0.87		
n				59		
[max], mg/L				3.62		
TSD multiplier, Table 3-2 (95/95)				1.5		
C_{95} is the projected maximum effluent concentration ([max, mg/L] * TSD multiplier)				**5.43**		

Attachment B-1

Month	Helena WWTP Interim Nutrient Waste Load Allocations	Total Nitrogen TN (lb/d)	Total Phosphorus as P TP (lb/d)
01/31/2007		167	93
02/28/2007		170	91
03/31/2007		158	80
04/30/2007		158	85
05/31/2007		238	97
06/30/2007		165	60
07/31/2007		175	82
08/31/2007		210	86
09/30/2007		183	80
10/31/2007		164	71
11/30/2007		217	91
12/31/2007		218	82
01/31/2008		176	61
02/29/2008		135	15
03/31/2008		179	108
04/30/2008		135	56
05/31/2008		154	22
06/30/2008		223	79
07/31/2008		141	114
08/31/2008		137	44
09/30/2008		117	68
10/31/2008			128
11/30/2008			100
12/31/2008		212	40
01/31/2009		167	146
02/28/2009		189	139
03/31/2009		168	85
04/30/2009		144	63
05/31/2009		145	76
06/30/2009		231	6
07/31/2009		96	31
08/31/2009		90	53
09/30/2009		122	54

10/31/2009		240	77
11/30/2009		233	17
12/31/2009		225	44
01/31/2010		293	20
02/28/2010		158	20
03/31/2010		194	19
04/30/2010		173	87
05/31/2010		113	31
06/30/2010		130	25
07/31/2010		131	24
08/31/2010		128	40
09/30/2010		229	82
10/31/2010		234	55
11/30/2010		150	74
12/31/2010		213	85
01/31/2011		166	27
02/28/2011		188	55
03/31/2011		194	56
04/30/2011		127	53
05/31/2011		158	51
06/30/2011		215	71
07/31/2011		122	54
08/31/2011		135	53
09/30/2011		144	77
10/31/2011		151	53
11/30/2011		148	58
12/31/2011		151	68
n =		58	60
Average		171	64
Standard Deviation		42	31
Coefficient of Variation (CV)		0.25	0.48
Average Weekly - LTA Multiplier *		1.72	2.60
Average Monthly- LTA Multiplier **		1.33	1.69
		TN	**TP**
Average Weekly Load (AWL), lb/day		**294**	**166**
Average Monthly Load (AML), lb/day		**227**	**108**

* Source: EPA, 1994, TSD, Table 5.2, MDL 99th Percentile

** Source: EPA, 1994, TSD, Table 5.2, AML 99th Percentile, n=4

Attachment B-2

HELENA TRADING CREDIT CALCULATIONS FOR NITROGEN AND SEPTIC SYSTEM CONNECTIONS - DRAFT

Subwatershed	Approx. No. of Septic Systems	Percent reduction during delivery(1)	Delivery Ratio(2)	Uncertainty Ratio(3)	Nitrogen concentration reaching surface water after delivery & uncertainty ratio applied (mg/L)(4)	Helena wastewater permit nitrogen concentration limit (mg/l) - estimated		Nitrogen available for trading credit (mg/L)(5)		Final trading credit ratio(6)	
						30-day	7-day	30-day	7-day	30-day	7-day
variable name		*A*	*B*	*C*	*D*	*E30*	*E7*	*F30*	*F7*	*G30*	*G7*
formula			*1 / (1-A)*		*50 / (B + (C-1))*			*D - E30*	*D - E7*	*50 / F30*	*50 / F7*
Lake Helena	2548	59.6%	2.48	1	20.2	10.5	13.7	9.7	6.5	5.15	7.69
Lower Prickly Pear Gulch	1002	52.3%	2.10	1	23.9	10.5	13.7	13.35	10.15	3.75	4.93
Lower Silver Creek	3049	49.3%	1.97	1	25.4	10.5	13.7	14.85	11.65	3.37	4.29
Lower Tenmile Creek	2409	48.5%	1.94	1	25.8	10.5	13.7	15.25	12.05	3.28	4.15
Sevenmile Creek	82	46.1%	1.86	1	27.0	10.5	13.7	16.45	13.25	3.04	3.77
WEIGHTED PLANNING AREA AVERAGE (7)	**9090**	**52.0%**	**2.12**	**1**	**23.86**	**10.5**	**13.7**	**13.36**	**10.16**	**3.88**	**5.27**

NOTES:

(1) This value is calculated using the Method for Estimating Attenuation of Nutrients from Septic Systems (MEANSS).

(2) This is the ratio of amount of nitrogen discharged from septic system as compared to amount of nitrogen reaching surface water after estimated reduction by denitrification. This does not account for in-stream nitrogen transformations from receiving stream to Prickly Pear Creek or Lake Helena.

(3) This is an additional reduction of nitrogen to account for the uncertainty in the method used to estimate how much nitrogen is removed between the drainfield and the surface water (a ratio of "1" indicates no additional reduction is applied).

(4) This value is the delivery and uncertainty ratio applied and converted into nitrogen concentration in order to compare to the nitrogen concentration discharge by Helena wastewater treatment plant. The concentration calculated here is based on the nitrogen concentration discharged from a conventional septic system/drainfield of 50 mg/L (a level 2 wastewater system would be based on a discharge of 24 mg/L, the formula would change to: "24 / (B + (C-1))", and the resulting trading credit ratio would be higher).

(5) This is the difference between the estimated nitrogen that discharges to surface water from a septic system and the wastewater discharge permit limit.

(6) This ratio is based on the nitrogen concentration available for credit divided by the nitrogen concentraton discharged by a conventional septic system/drainfield, 50 mg/L. For example, a value of 3.88 means that for every 3.88 pounds of nitrogen discharged from a drainfield one pound of credit is applied to the nitrogen concentration and/or load limit(s) in the permit.

(7) Planning Area Averages are weighted based on number of septic systems in each subwatershed.

Attachment C-1

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Recoverable Antimony								
	Variables	Units	Human Health (no sample shall exceed)		Aquatic Life Support (Acute)		Aquatic Life Support (Chronic)	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350				
C_d	Concentration in Discharge	mg/L	C_{95}	0.0019	C_{95}		C_{95}	
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0		0	
C_s	Concentration in Stream	mg/L		0.011				
C_r	**Concentration Down Stream**	**mg/L**		**0.0019**				
			hh	0.0056	als-a		als-c	
RP				**no**				
7Q10		cfs		0				
EFF CV				0.654				
EFF n				9				
EFF [max], mg/L				0.001				
TSD multiplier, Table 3-2 (95/95)				1.91				
C_{95} is the projected maximum effluent concentration ([max, mg/L]* TSD multiplier)				**0.0096**				

Attachment C-2

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Recoverable Arsenic								
	Variables	Units	Human Health (no sample shall exceed)		Aquatic Life Support (Acute)		Aquatic Life Support (Chronic)	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350		8.350		8.350
C_d	Concentration in Discharge	mg/L	C_{95}	0.006	C_{95}	0.006	C_{95}	0.006
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0	0	0	0
C_s	Concentration in Stream	mg/L		*0.011*		*0.011*		*0.011*
C_r	**Concentration Down Stream**	**mg/L**		**0.0058**		**0.0058**		**0.0058**
			hh	0.010	als-a	0.340	als-c	0.150
RP				**no**		**no**		**no**
7Q10		cfs		0		0		0
CV				0.268		0.268		0.268
n				20		20		20
[max], mg/L				0.005		0.005		0.005
TSD multiplier, Table 3-2 (95/95)				1.168		1.168		1.168
C_{95} is the projected maximum effluent concentration ([max, mg/L]*TSD multiplier)				**0.0058**		**0.0058**		**0.0058**

Attachment C-3

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Recoverable Cadmium								
	Variables	Units	Human Health (no sample shall exceed)		Aquatic Life Support (Acute)		Aquatic Life Support (Chronic)	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350		8.350		8.350
C_d	Concentration in Discharge	mg/L	C_{95}	0.001	C_{95}	0.001	C_{95}	0.001
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0	0	0	0
C_s	Concentration in Stream	mg/L		*0.011*		*0.011*		*0.011*
C_r	**Concentration Down Stream**	**mg/L**		**0.0011**		**0.0011**		***0.0011***
			hh	0.005	als-a	0.0019	als-c	0.0003
RP				**no**		**no**		**yes**
7Q10		cfs		0		0		0
CV				0.115		0.115		0.115
n				20		20		20
[max], mg/L				0.001		0.001		0.001
TSD multiplier, Table 3-2 (95/95)				1.1		1.1		1.1
C_{95} is the projected maximum effluent concentration ([max, mg/L] * TSD multiplier)				**0.0011**		**0.0011**		**0.0011**

Values in *italics* were reported as less than/equal to the method reporting level.

Attachment C-4

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Recoverable Copper								
	Variables	Units	Human Health (no sample shall exceed)		Aquatic Life Support (Acute)		Aquatic Life Support (Chronic)	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350		8.350		8.350
C_d	Concentration in Discharge	mg/L	C_{95}	0.104	C_{95}	0.104	C_{95}	0.104
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0	0	0	0
C_s	Concentration in Stream	mg/L		0.005		0.005		0.005
C_r	**Concentration Down Stream**	**mg/L**		**0.1044**		**0.1044**		**0.1044**
			hh	1.30	als-a	0.0128	als-c	0.0086
RP				**no**		**yes**		**yes**
7Q10		cfs		0		0		0
CV				0.791		0.791		0.791
n				20		20		20
[max], mg/L				0.070		0.070		0.070
TSD multiplier, Table 3-2 (95/95)				1.491		1.491		1.491
C_{95} is the projected maximum effluent concentration ([max, mg/L]*TSD multiplier)				**0.1044**		**0.1044**		**0.1044**

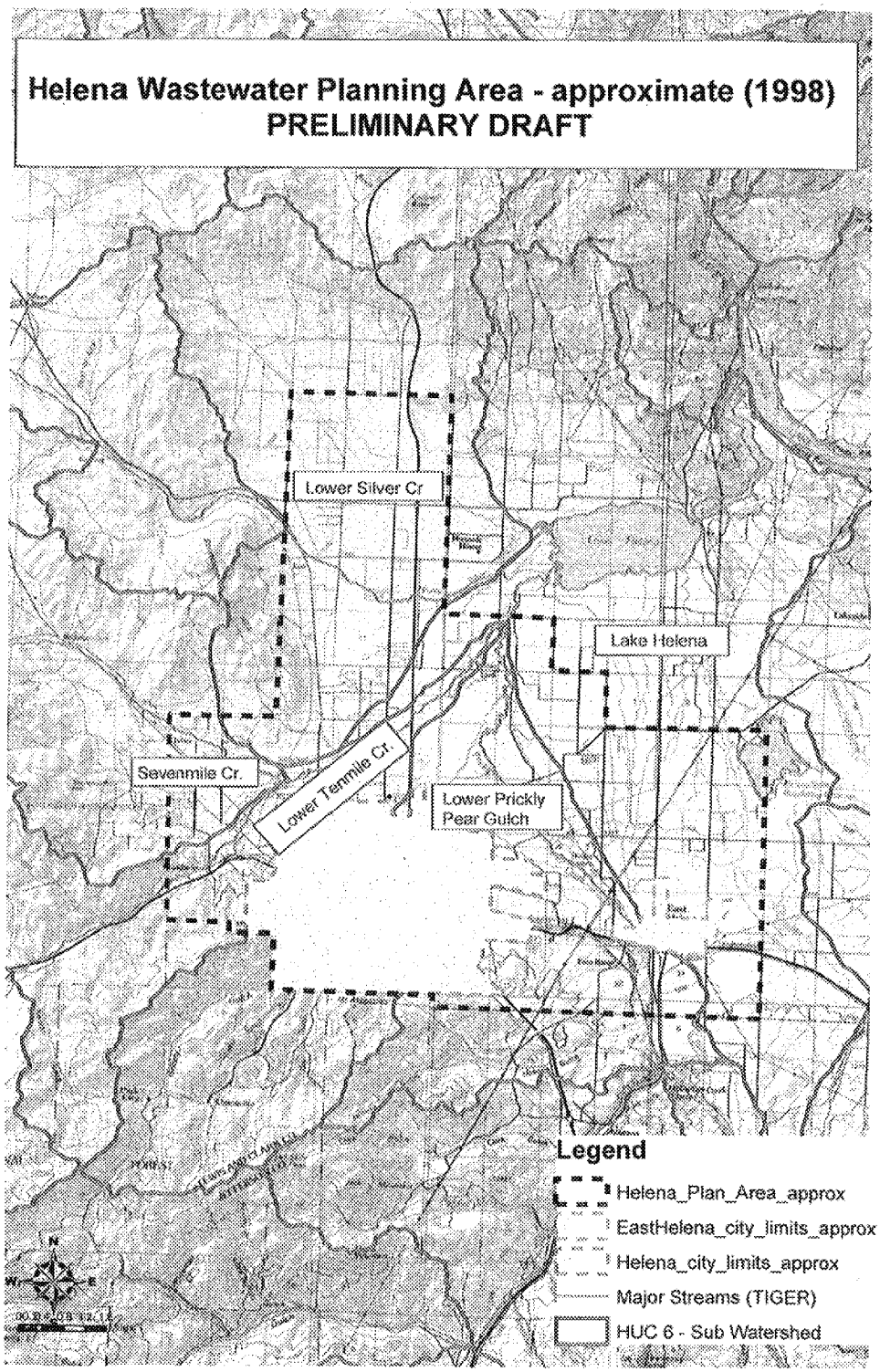
Attachment C-5

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Recoverable Lead								
	Variables	Units	Human Health (no sample shall exceed)		Aquatic Life Support (Acute)		Aquatic Life Support (Chronic)	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350		8.350		8.350
C_d	Concentration in Discharge	mg/L	C_{95}	0.013	C_{95}	0.013	C_{95}	0.013
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0	0	0	0
C_s	Concentration in Stream	mg/L		*0.005*		*0.005*		*0.005*
C_r	**Concentration Down Stream**	**mg/L**		**0.0125**		**0.0125**		**0.0125**
			hh	0.015	als-a	0.0724	als-c	0.0028
RP				**no**		**no**		**yes**
7Q10		cfs		0		0		0
CV				0.450		0.450		0.450
n				20		20		20
						0.0100		0.0100
[max], mg/L				0.010		0		0
TSD multiplier, Table 3-2 (95/95)				1.25		1.25		1.25
C_{95} is the projected maximum effluent concentration ([max, mg/L]*TSD multiplier)				**0.0125**		**0.0125**		**0.0125**

Attachment C-6

Helena WWTP Discharge to Prickly Pear Creek RP Analysis for Total Recoverable Zinc								
	Variables	Units	Human Health (no sample shall exceed)		Aquatic Life Support (Acute)		Aquatic Life Support (Chronic)	
Q_d	Discharge Flow (Design Q for POTW)	cfs		8.350		8.350		8.350
C_d	Concentration in Discharge	mg/L	C_{95}	0.242	C_{95}	0.242	C_{95}	0.242
Q_s	Applicable Stream Flow (% of 7Q10)	cfs	0	0	0	0	0	0
C_s	Concentration in Stream	mg/L		0.067		0.067		0.067
C_r	**Concentration Down Stream**	**mg/L**		**0.242**		**0.242**		**0.242**
			hh	2.00	als-a	0.111	als-c	0.111
RP				**no**		**yes**		**yes**
7Q10		cfs		0		0		0
CV				0.311		0.311		0.311
n				20		20		20
[max], mg/L				0.200		0.200		0.200
TSD multiplier, Table 3-2 (95/95)				1.21		1.21		1.21
C_{95} is the projected maximum effluent concentration ([max, mg/L] * TSD multiplier)				**0.242**		**0.242**		**0.242**

Attachment C-7



Major POTW
w/Industrial Pretreatment
Permit No.: MT0022641

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

AUTHORIZATION TO DISCHARGE UNDER THE
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with Montana Water Quality Act, Title 75, Chapter 5, Montana Code Annotated (MCA) and the Federal Water Pollution Control Act (the "Clean Water Act"), 33 U.S.C. § 1251 *et seq.*,

City of Helena

is authorized to discharge from its **domestic wastewater treatment plant**

located at **2108 Custer Avenue East,**

to receiving waters named **Prickly Pear Creek**

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein. Authorization for discharge is limited to those outfalls specifically listed in the permit.

This permit shall become effective **October 1, 2012**.

This permit and the authorization to discharge shall expire at midnight, **September 30, 2017**.

FOR THE MONTANA DEPARTMENT OF
ENVIRONMENTAL QUALITY

Jenny Chambers

Jenny Chambers, Chief
Water Protection Bureau
Permitting & Compliance Division

Issuance Date: August 22, 2012

TABLE OF CONTENTS

Cover Sheet--Issuance and Expiration Dates

I. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS & OTHER CONDITIONS 3

A. DESCRIPTION OF DISCHARGE POINTS AND MIXING ZONE 3
B. EFFLUENT LIMITATIONS 4
C. MONITORING REQUIREMENTS 7
D. SPECIAL CONDITIONS 12

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS 21

A. REPRESENTATIVE SAMPLING 21
B. MONITORING PROCEDURES 21
C. PENALTIES FOR TAMPERING 21
D. REPORTING OF MONITORING RESULTS 21
E. COMPLIANCE SCHEDULES 21
F. ADDITIONAL MONITORING BY THE PERMITTEE 22
G. RECORDS CONTENTS 22
H. RETENTION OF RECORDS 22
I. TWENTY-FOUR HOUR NOTICE OF NONCOMPLIANCE REPORTING 22
J. OTHER NONCOMPLIANCE REPORTING 23
K. INSPECTION AND ENTRY 23

III. COMPLIANCE RESPONSIBILITIES 25

A. DUTY TO COMPLY 25
B. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS 25
C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE 25
D. DUTY TO MITIGATE 25
E. PROPER OPERATION AND MAINTENANCE 25
G. BYPASS OF TREATMENT FACILITIES 26
H. UPSET CONDITIONS 27

IV. GENERAL REQUIREMENTS 29

A. PLANNED CHANGES 29
B. ANTICIPATED NONCOMPLIANCE 29
C. PERMIT ACTIONS 29
D. DUTY TO REAPPLY 29
E. DUTY TO PROVIDE INFORMATION 29
F. OTHER INFORMATION 29
G. SIGNATORY REQUIREMENTS 30
H. PENALTIES FOR FALSIFICATION OF REPORTS 30
I. AVAILABILITY OF REPORTS 31
J. OIL AND HAZARDOUS SUBSTANCE LIABILITY 31
K. PROPERTY OR WATER RIGHTS 31
L. SEVERABILITY 31
M. TRANSFERS 31
N. FEES 32
O. REOPENER PROVISIONS 32

V. DEFINITIONS 33

I. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS & OTHER CONDITIONS

A. Description of Discharge Points and Mixing Zone

The authorization to discharge provided under this permit is limited to those outfalls specially designated below as discharge locations. Discharges at any location not authorized under an MPDES permit is a violation of the Montana Water Quality Act and could subject the person(s) responsible for such discharge to penalties under the Act. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge within a reasonable time from first learning of an unauthorized discharge could subject such person to criminal penalties as provided under Section 75-5-632 of the Montana Water Quality Act.

Outfall	Description
001	Location: At the end of the pipe, discharging into Prickly Pear Creek, located at approximately 46°38'36" N latitude, 111°59'4" W longitude. Mixing Zone: Instantaneous. Treatment Works: Major, POTW, 5.4 mgd, activated sludge, mechanical treatment plant with UV disinfection and continuous discharge to surface water.

B. Effluent Limitations

Outfall 001

Interim Limitations

Effective immediately and lasting through midnight **August 31, 2017**, the quality of effluent discharged by the facility shall, as a minimum, meet the limitations as set forth below.

Parameter	Units	Average Monthly Limitation (1)	Average Weekly Limitation (1)	Maximum Daily Limitation (1)
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	--
	lb/day	1,351	2,027	--
Total Suspended Solids (TSS)	mg/L	30	45	--
	lb/day	1,351	2,027	--
E. coli Bacteria, summer (2)	cfu/100 mL	126	252	--
E. coli Bacteria, winter (3)	cfu/100 mL	630	1,260	--
Oil and Grease	mg/L	--	--	< 10
Total Ammonia as N	mg/L	1.67	3.83	--
Total Nitrogen (4, 5, 6)	lb/day	227	294	--
Total Nitrogen (4, 5, 7)	lb/day	227 – 231	294 – 298	--
Total Nitrogen (4, 5, 8)	lb/day	227 – 235	294 – 302	--
Total Nitrogen (4, 5, 9)	lb/day	227 – 239	294 – 306	--
Total Nitrogen (4, 5, 10)	lb/day	227 - 243	294 – 310	
Total Phosphorus Load (5)	lb/day	108	166	--

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) This limit applies during the period April 1 through October 31.
(3) This limit applies during the period November 1 through March 31.
(4) Calculated as the sum of Total Kjeldahl Nitrogen (TKN) and nitrate plus nitrite as N concentrations.
(5) Interim adaptive management Wasteload Allocations.
(6) Effective from permit effective date through December 31, 2013.
(7) Effective January 1, 2014. See Fact Sheet.
(8) Effective January 1, 2015. See Fact Sheet.
(9) Effective January 1, 2016. See Fact Sheet.
(10) Effective January 1, 2017. See Fact Sheet.

pH: Effluent pH from Outfall 001 shall remain between 6.5 and 9.0 standard units (instantaneous minimum and instantaneous maximum). For compliance purposes, any single analysis or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

85 Percent (%) Removal Requirement for BOD_5: The arithmetic mean of the BOD_5 for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at

approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on BOD_5.

85 Percent (%) Removal Requirement for TSS: The arithmetic mean of the TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on TSS.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

Final Limitations

Effective **September 1, 2017** and lasting through the term of the permit, the quality of effluent discharged by the facility shall, as a minimum, meet the limitations as set forth below:

Parameter	Units	Average Monthly Limitation (1)	Average Weekly Limitation (1)	Maximum Daily Limitation (1)
BOD_5	mg/L	30	45	--
	lb/day	1,351	2,027	--
TSS	mg/L	30	45	--
	lb/day	1,351	2,027	--
E. coli Bacteria, summer (2)	cfu/100 mL	126	252	--
E. coli Bacteria, winter (3)	cfu/100 mL	630	1,260	--
Oil and Grease	mg/L	--	--	< 10
Total Ammonia as N	mg/L	1.67	3.83	--
Total Nitrogen (4, 5, 6)	lb/day	227	294	--
Total Nitrogen (4, 5, 7)	lb/day	227 – 231	294 – 298	--
Total Nitrogen (4, 5, 8)	lb/day	227 – 235	294 – 302	--
Total Nitrogen (4, 5, 9)	lb/day	227 – 239	294 – 306	--
Total Nitrogen (4, 5, 10)	lb/day	227 - 243	294 – 310	
Total Phosphorus as P (5)	lb/day	108	166	--
Copper, Total Recoverable	mg/L	0.009	--	0.013
Zinc, Total Recoverable	mg/L	0.11	--	0.11

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) This limit applies during the period April 1 through October 31.
(3) This limit applies during the period November 1 through March 31.
(4) Calculated from the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen (TKN) concentrations.
(5) Interim adaptive management Wasteload Allocation.
(6) Effective from permit effective date through December 31, 2013.
(7) Effective January 1, 2014. See Fact Sheet.
(8) Effective January 1, 2015. See Fact Sheet.
(9) Effective January 1, 2016. See Fact Sheet.
(10) Effective January 1, 2017. See Fact Sheet.

pH: Effluent pH from Outfall 001 shall remain between 6.5 and 9.0 standard units (instantaneous minimum and instantaneous maximum). For compliance purposes, any single analysis or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

85 Percent (%) Removal Requirement for BOD_5: The arithmetic mean of the BOD_5 for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on BOD_5.

85 Percent (%) Removal Requirement for TSS: The arithmetic mean of the TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on TSS.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

C. Monitoring Requirements

As a minimum, upon the effective date of this permit through the term of the permit, the following constituents shall be monitored at the frequency and with the type of measurement indicated; samples or measurements shall be representative of the volume and nature of the monitored discharge. If no discharge occurs during the entire monitoring period, it shall be stated on the Discharge Monitoring Report (DMR) Form (EPA No. 3320-1) that no discharge or overflow occurred.

Samples shall be collected, preserved, and analyzed at the RRV in accordance with approved procedures listed in 40 CFR 136. The Required Reporting Value (RRV) is the detection level that must be achieved in reporting surface water monitoring or compliance data to the Department. The RRV is the Department's best determination of a level of analysis that can be achieved by the majority of the commercial, university, or governmental laboratories using EPA-approved methods or methods approved by the Department.

Influent flow is measured with a Parshall flume (primary device) and ultrasonic meter (secondary device). In order to be representative of the nature and volume of the flow being monitored, influent sample collection and flow monitoring must occur prior to equalization or any recycle flow returns. Effluent flow monitoring occurs post UV disinfection system at a Cipolletti weir and staff gauge with an ultrasonic meter secondary device. The permittee shall monitor the discharge from Outfall 001 at the last point of control following treatment (post UV system) prior to entering the effluent ditch.

Parameter	Unit	Sample Location	Sample Frequency	Sample Type (1)	RRV
Flow	mgd	Influent	Continuous	(2)	--
	mgd	Effluent	Continuous	(2)	--
BOD_5	mg/L	Influent	5/Week	Composite	2
	mg/L	Effluent	5/Week	Composite	2
	lb/day	Effluent	1/Month	Calculated	--
	% Removal (3)	Effluent	1/Month	Calculated	--
TSS	mg/L	Influent	5/Week	Composite	10
	mg/L	Effluent	5/Week	Composite	10
	lb/day	Effluent	1/Month	Calculated	--
	% Removal (3)	Effluent	1/Month	Calculated	--
pH	s.u.	Effluent	Daily	Instantaneous	0.1
Temperature	°C	Effluent	Daily	Instantaneous	--
E. coli Bacteria (4)	cfu/100 mL	Effluent	5/Week	Grab	1
Total Ammonia as N	mg/L	Effluent	1/Week	Composite	0.1
Nitrate + Nitrite as N	mg/L	Effluent	1/Week	Composite	0.05
Total Kjeldahl Nitrogen	mg/L	Effluent	1/Week	Composite	0.1
Total Nitrogen (5)	mg/L	Effluent	1/Week	Calculated	--
	lb/day	Effluent	1/Month	Calculated	--
	tons/year	Effluent	1/Year	Calculated	--
Total Phosphorus as P	mg/L	Effluent	1/Week	Composite	--
	lb/day	Effluent	1/Month	Calculated	--
	tons/year	Effluent	1/Year	Calculated	--
Oil and Grease (visual)	presence	Effluent	1/Day	Visual	--
Oil and Grease (6)	mg/L	Effluent	1/Month	Grab	1
Total Dissolved Solids	mg/L	Effluent	1/Quarter	Grab	10
Whole Effluent Toxicity, Chronic (7)	% Effluent	Effluent	1/Quarter	Composite	--

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) Requires recording device or totalizer; permittee shall report maximum daily and average monthly flow on DMR.
(3) Percent Removal shall be calculated using the monthly average values.
(4) Report Geometric Mean if more than one sample is collected during the reporting period.
(5) Calculated as the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen (TKN) concentrations.
(6) Collect a sample and analyze using EPA Method 1664 Revision A: N-Hexane Extractable Material (HEM). Sampling is only required on any day a visual sheen is observed on the secondary clarifiers.
(7) Sampling is required starting the first full calendar quarter following the effective date of the permit.

Parameter	Units	Sample Frequency	Sample Type (1)	RRV/ML
Aluminum, Dissolved (2)	mg/L	1/Quarter	Composite	0.030
Antimony, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.003
Arsenic, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.003
Cadmium, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.00008
Copper, Total Recoverable (2)	mg/L	1/Month	Composite	0.001
Lead, Total Recoverable (2)	mg/L	1/Quarter	Composite	0.0005
Zinc, Total Recoverable (2)	mg/L	1/Month	Composite	0.010
Beryllium, Total Recoverable (2)	mg/L	1/Year	Composite	0.001
Chromium, Total Recoverable (2)	mg/L	1/Year	Composite	0.001
Mercury, Total Recoverable (2)	mg/L	1/Year	Composite	0.00001
Nickel, Total Recoverable (2)	mg/L	1/Year	Composite	0.010
Selenium, Total Recoverable (2)	mg/L	1/Year	Composite	0.001
Silver, Total Recoverable (2)	mg/L	1/Year	Composite	0.0005
Thallium, Total Recoverable (2)	mg/L	1/Year	Composite	0.0002
Cyanide, Total (3)	mg/L	1/Year	Grab	5
Phenols, Total (3)	mg/L	1/Year	Grab	10
Total Hardness, as $CaCO_3$ (3)	mg/L	1/Quarter	Composite	10
Volatile Organic Pollutants (4)	mg/L	1/Year	Composite	(5)
Semi-Volatile, Acid Compounds (4)	mg/L	1/Year	Composite	(5)
Semi-Volatile, Base Neutral (4)	mg/L	1/Year	Composite	(5)

Footnotes:
(1) See Definition section at end of permit for explanation of terms.
(2) Both influent and effluent shall be sampled. Metals shall be analyzed as total recoverable with the exception of dissolved aluminum; use EPA Method (Section) 4.1.4 [EPA 600/4-79-020, March 1983] or equivalent.
(3) Effluent samples only.
(4) Both influent and effluent shall be sampled in accordance with 40 CFR 122, Appendix D, Table II. Analysis results will not be submitted on a DMR; complete laboratory analysis reports shall be submitted with the applicable DMR for the reporting period.

Samples shall be collected in different calendar quarters each year so that at least one sample is collected in each calendar quarter over the term of the permit.

(5) See approved method for minimum level of detection (ML).

1. Whole Effluent Toxicity Testing – Chronic Toxicity

Starting in the first calendar quarter following the effective date of the permit, the permittee shall, at least once each quarter conduct chronic static replacement toxicity tests on a composite sample of the effluent. Testing will employ two species per quarter and will consist of 5 effluent concentrations (100, 50, 25, 12.5, 6.25 percent effluent) and a control. The control shall consist of receiving water. Moderately hard laboratory reconstituted water may be used if the receiving stream is dewatered, or if the receiving water exhibits toxicity. Samples shall be collected on a two day progression; i.e., if the first quarterly sample is on a Monday, the second quarter sample shall be on a Wednesday, etc. Saturdays, Sundays and Holidays will be skipped in the progression.

The static toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, EPA-821-R-02-013 and the "*Region VIII EPA NPDES Acute Test Conditions-Static Renewal Whole Effluent Toxicity*". The permittee shall conduct a chronic 3-brood static renewal toxicity test using one crustacean (*Ceriodaphnia dubia.)* and a chronic 7-day static renewal toxicity test using fathead minnows (*Pimephales promelas*).

Chronic toxicity occurs when a statistically significant difference in either lethal or sub-lethal effects is observed between any concentration and the control for either species. For tests to be acceptable, control survival must be 80% or greater. At the end of the test, the average dry weight of surviving seven-day old fathead minnows in the controls must equal or exceed 0.25 mg. In *Ceriodaphnia dubia* controls, 60% or more of the surviving females must have produced their third brood in 7 ± 1 days, and the number of young per surviving female must be 15 or greater. If these acceptability criteria are not met, the test is considered invalid and shall be repeated until satisfactory results are achieved.

If toxicity occurs in a routine test, an additional test shall be conducted within 14 days of the date of the initial sample. Should toxicity occur in the second test (resample), testing shall occur once a month until further notified by the Department. In all cases, the results of all toxicity tests must be submitted to the Department in accordance with Part II of this permit.

The quarterly results from the laboratory shall be reported along with the Discharge Monitoring Report (DMR) form submitted for the end of the reporting calendar quarter (e.g., whole effluent results for the reporting quarter ending March 31 shall be reported with the March DMR postmarked by April 28th with the remaining quarterly reports submitted with the June, September, and December DMR's). The format for the laboratory report shall be consistent with the latest revision of Region VIII Guidance for Acute Whole Effluent Reporting, and shall include all chemical and physical data as specified.

If the results for four consecutive quarters of testing indicate no chronic toxicity, the permittee may request a reduction to quarterly chronic toxicity testing on only one species on an alternating basis. The Department may approve or deny the request based on the results and other available information without an additional public notice. If the request is approved, the test procedures are to be the same as specified above.

6. Toxicity Reduction Evaluation / Toxicity Identification Evaluation:

Should chronic toxicity be detected in the required resample, a TIE-TRE shall be undertaken by the permittee to establish the cause of the toxicity, locate the source(s) of the toxicity, and develop control or treatment for the toxicity. Failure to initiate or conduct an adequate TIE-TRE, or delays in the conduct of such tests, shall not be considered a justification for noncompliance with the whole effluent toxicity limits contained in Part I.B of this permit. A TRE plan must be submitted to the Department within 45 days after confirmation of the continuance of effluent toxicity (resample).

2. Reporting Requirements

Load Calculations

In addition to reporting the concentration values, the monthly loads expressed in pounds per day (lb/day) must be calculated and reported for BOD_5, TSS, total phosphorus as P and total nitrogen. The monthly loads must be calculated using the average daily flow rate and daily average parameter concentration as shown in the following equations:

Load (lb/day)
Parameter concentration (mg/L) x Effluent Flow Rate (mgd) x (8.34)

Percent (%) Removal
The percent removal shall be calculated using the following formula:

$$\% \text{ Removal} = \frac{(\textit{Influent Concentration}) - (\textit{Effluent Concentration})}{(\textit{Influent Concentration})} \times 100$$

Where:
Influent Concentration = Corresponding 30-day average influent concentration based on the analytical results of the reporting period.

Effluent Concentration = Corresponding 30-day average effluent concentration based on the analytical results of the reporting period.

Average Monthly Limit (AML)

The AML or 30-day average is the Arithmetic Average or mean (except for *E. coli* bacteria) of all of the Daily Discharge samples collected during a calendar month, as defined in Part V of the permit. If only one sample is collected then it is considered to be the 30-day average and reported on the DMR.

Average Weekly Limit (AWL)

The AWL or 7-day average is the Arithmetic Average or mean (except for *E. coli* bacteria) of all of the Daily Discharge samples collected during a calendar week, as defined in Part V of the permit. If only one sample is collected during the calendar week it is considered the 7-day average. The highest 7-day average of the monitoring period shall be reported on the 7-day average blank on the DMR. In cases where only one sample is collected during the entire monitoring period, that sample shall be reported as both the 30-day and 7-day averages.

D. Special Conditions

1. Sewage Sludge:

The use or disposal of sewage sludge must be in conformance with the Environmental Protection Agency (EPA) General Permit MTG650000 or an equivalent permit issued pursuant to 40 CFR 503. A notice of intent must be filed with the EPA and the Department in accordance with the timeframes and procedures identified in the applicable permit. All materials required by the General Permit to be submitted to the Department shall be signed in accordance with Part IV.G and sent to the address provided in Part II.D of this permit.

The permittee shall not dispose of sewage sludge such that any portion thereof enters any state water, including ground water. The permittee shall notify the Department in writing 45 days prior to any change in sludge management at the facility.

2. Starting the first full calendar year of the permit cycle (2013) and lasting for the duration of the Special Condition, an annual report shall be submitted to the Department with the December DMR (postmarked no later than January 28th). The reports shall describe the milestones accomplished and the steps planned for each year towards compliance with the final effluent limitations for total recoverable copper and total recoverable zinc.

3. During calendar years 2014 and 2015 the permittee shall conduct a study of dissolved oxygen concentrations in the effluent channel and the receiving water. The study shall be conducted between July 15 and September 15 each year. DO samples shall be collected weekly at three locations: In Prickly Pear Creek

upstream of the effluent channel, in Prickly Pear Creek downstream of the effluent channel, and within the effluent channel prior to discharge to and outside the influence of Prickly Pear Creek. Results shall be submitted in a written report. The report must document the location, date, and time of each analysis. All analyses must be conducted using 40 CFR 136 approved methods. The written report shall be submitted to the Water Protection Bureau, postmarked no later than December 31 following each study (2014 and 2015).

4. Facility Optimization Study for TN and TP – The permittee shall conduct a facility optimization study to improve treatment efficiency for TN and TP and submit a plan for achieving optimization by the expiration date of the permit. Effluent limits will be developed from the optimization study and may be applied in the next permit renewal. The permittee shall adhere to the following schedule with respect to optimization:

    a. The facility optimization study shall be completed and submitted to the Department postmarked no later than one year after the permit effective date. The study must identify the long term average (LTA) concentrations of TN and TP achievable by the facility in its present configuration. Effluent load limits for TN and TP will be developed based on these LTA and the design flow of the facility following the method use to develp the IWLA in this permit. The smaller of either the optimization-based load limits or the IWLA in this permit will be incorporated into the next permit renewal as effluent limits for TN and TP.
    b. No later than two years after the permit effective date, the permittee must submit a plan for implementing the optimization study and achieving the effluent concentrations and load limits described above. The plan must include achievement of these effluent limits no later than the expiration date of this permit.
    c. At the end of each calendar year following the submission of the above plan, the permittee shall submit an annual report describing progress made towards implementation of the optimization study and compliance with the effluent limits described above. Progress reports for the previous year shall be submitted and postmarked no later than January 28th.

5. Irrigation of the WWTF Campus – Upon Department review and approval of plans and specifications, the permittee may commence land application/irrigation with treated effluent. This authorization applies to the irrigation of facility grounds and adjacent public property only. Any other land application of treated effluent will require the submission of an updated permit application, including DEQ Form LA-1.

    As of April 2011, the permittee is authorized for land application/reuse of treated effluent on the facility grounds. Any additional land application on adjacent public property must undergo plan and specification review and approval by the Department. Once the plan and specification approval is granted, the permittee must submit a letter to the Water Protection Bureau indicating the planned date

for the commencement of the additional irrigation and the anticipated volume of treated effluent that will be used for this purpose. The letter must be submitted prior to the use of effluent for irrigation, and no later than December 31, 2013.

E. Industrial Pretreatment Program - Contributing Industries and Pretreatment Requirements

a. The Permittee shall operate an industrial pretreatment program in accordance with the following permit requirements developed pursuant to Section 402(b)(8) of the Clean Water Act, the General Pretreatment Regulations (40 CFR Part 403) and the approved pretreatment program submitted by the Permittee. The pretreatment program was approved on July 24, 1986 and has subsequently incorporated substantial modifications as approved by the Approval Authority. The approved pretreatment program, and any approved modifications thereto, is hereby incorporated by reference and shall be implemented in a manner consistent with the following requirements:

i. Industrial user information shall be updated at a minimum of once per year or at that frequency necessary to ensure that all Industrial Users are properly permitted and/or controlled. The records shall be maintained and updated as necessary;

ii. The Permittee shall sample and inspect each Significant Industrial User (SIU) at least once per calendar year (40 CFR Section 403.8(f)(2)(v)). This is in addition to any industrial self-monitoring activities. If the Permittee performs sampling for any SIU, then the Permittee shall perform any repeat sampling and analysis within 30 days of becoming aware of the violation (40 CFR Section 403.12(g)(2);

iii. The Permittee shall evaluate whether each SIU needs a plan to control Slug Discharges. SIUs must be evaluated within 1 year of being designated an SIU. Where needed, the Permittee shall require the SIU to prepare or update, and then implement the plan. Where a slug prevention plan is required, the Permittee shall ensure that the plan contains at least the minimum elements required in 40 CFR Section 403.8(f)(2)(vi). If required, the Permittee shall incorporate slug control requirements into the control mechanism for the SIU. (40 CFR, Section 403.8(f)(1)(*iii*)(B)(6)).;

iv. The Permittee shall investigate instances of non-compliance with Pretreatment Standards and requirements indicated in reports and notices required under 40 CFR Section 403.12, or indicated by analysis, inspection, and surveillance activities.

v. The Permittee shall enforce all applicable Pretreatment Standards and requirements and obtain remedies for noncompliance by any industrial user;

vi. The Permittee shall control, through the legal authority in the approved pretreatment program, the contribution to the Publicly Owned Treatment Works (POTW) by each industrial user to ensure compliance with applicable Pretreatment Standards and requirements. In the case of industrial users identified as significant under 40 CFR Section 403.3(v), this control shall be achieved through permit, order, or similar

means and shall contain, at a minimum, the following conditions:

(A) Statement of duration (in no case more than five (5) years);

(B) Statement of non-transferability without, at a minimum, prior notification to the Permittee and provision of a copy of the existing control mechanism to the new owner or operator;

(C) Effluent limits, including Best Management Practices, based on applicable Pretreatment Standards, Categorical Pretreatment Standards, local limits, and State and local law;

(D) Self-monitoring, sampling, reporting, notification and record keeping requirements, including an identification of the pollutants to be monitored, sampling location, sampling frequency, and sample type, including documentation on BMP compliance, based on the applicable Pretreatment Standards in 40 CFR Part 403, Categorical Pretreatment Standards, local limits, and State and local law; and,

(E) Statement of applicable civil and criminal penalties for violation of Pretreatment Standards and requirements, and any applicable compliance schedule. Such schedules may not extend the compliance date beyond deadlines mandated by federal statute or regulation.

(F) Requirements to control Slug Discharges, if determined by the POTW to be necessary.

vii. The Permittee shall provide adequate staff, equipment, and support capabilities to carry out all elements of the pretreatment program as required by 40 CFR Section 403.8(f)(3);

viii. The approved program shall not be substantially modified by the Permittee without the approval of the EPA. Substantial and non-substantial modifications shall follow the procedures outlined in 40 CFR Section 403.18;

ix. The Permittee shall develop, implement, and maintain an enforcement response plan as required by 40 CFR Section 403.8(f)(5); and

x. The Permittee shall notify all Industrial Users of the users' obligations to comply with applicable requirements under Subtitles C and D of the Resource Conservation and Recovery Act (RCRA) as required by 40 CFR Section 403.8(f)(2)(iii).

b. The Permittee shall establish and enforce specific local limits to implement the provisions of 40 CFR Section 403.5(a) and (b), as required by 40 CFR Section 403.5(c). The Permittee shall continue to develop these limits as necessary and effectively enforce such limits.

In accordance with EPA policy and with the requirements of 40 CFR sections 403.8(f)(4) and 403.5(c), the Permittee shall determine if technically based local limits are necessary to implement the general and specific prohibitions of 40 CFR sections 403.5(a) and (b).

This evaluation should be conducted in accordance with the latest revision of the "EPA Region VIII Strategy for Developing Technically Based Local Limits", and after review of EPA's "Local Limits Development Guidance" July 2004. Where the Permittee determines that revised or new local limits are necessary, the Permittee shall submit the proposed local limits to the Approval Authority in an approvable form in accordance with 40 CFR Section 403.18.

c. The Permittee shall analyze the treatment facility influent and effluent for the presence of the toxic pollutants listed in 40 CFR Part 122 Appendix D (NPDES Application Testing Requirements) Table II at least once per year and the toxic pollutants in Table III at least four times per year. If, based upon information available to the Permittee, there is reason to suspect the presence of any toxic or hazardous pollutant listed in Table V, or any other pollutant in a quantity or concentration known or suspected to adversely affect POTW operation, receiving water quality, or solids disposal procedures, analysis for those pollutants shall be performed at least four times per year on both the influent and the effluent.

    i. Along with the Permittee's pretreatment annual report, the Permittee will submit a list of compounds included in Table V that are suspected or known to be present in its influent wastewater. This determination shall be based on a review of the Permittee's pretreatment program records. The state permitting authority and/or Approval Authority may review and comment on the list and the list may be revised if, in the opinion of the state permitting authority and/or Approval Authority, the list is incomplete. The Permittee will perform analysis four times per year on the influent for the revised list of compounds for which there are acceptable testing procedures.

    ii. Where the pollutants monitored in accordance with this section are reported as being above the method detection limit, the results for these pollutants shall be reported in the Permittee's pretreatment annual report, if required by EPA.

d. The Permittee shall analyze the treatment facility sludge (biosolids) prior to disposal, for the presence of toxic pollutants listed in 40 CFR 122 Appendix D (NPDES Application Testing Requirements) Table III at least once per year. If the Permittee does not dispose of biosolids during the calendar year, the Permittee shall certify to that in the Pretreatment Annual Report and the monitoring requirements in this paragraph shall be suspended for that calendar year.

    i. The Permittee shall review the pollutants in 40 CFR Part 122, Appendix D, tables II and V. If any of the pollutants in these tables were above detection in the influent samples during the previous 2 years or the last two analyses, whichever is greater, the Permittee shall sample and analyze its sewage sludge for these pollutants. The Permittee shall perform this evaluation and analysis at least once per year.

ii. The Permittee shall use sample collection and analysis procedures as approved for use under 40 CFR Part 503 or specified in the EPA Region 8 General Permit for biosolids.

iii. The Permittee shall report the results for these pollutants in the Permittee's pretreatment annual report, if required by EPA.

e. All analyses shall be in accordance with test procedures established in 40 CFR Part 136. Where sampling methods are not specified, the influent and effluent samples collected shall be composite samples consisting of at least twelve (12) aliquots collected at approximately equal intervals over a representative 24-hour period and composited according to flow. Where automated composite sampling is inappropriate, at least four (4) grab samples shall be manually taken at equal intervals over a representative 24-hour period, and composited prior to analysis using approved methods; alternatively, the individual grab samples may be analyzed separately and the results from the respective grab samples mathematically combined based on flow (i.e., flow weighted) for the final result.

f. The Permittee shall prepare annually a list of industrial users, which during the preceding twelve (12) months have significantly violated Pretreatment Standards or requirements. This list is to be published annually in a newspaper of general circulation in the Permittee's service area as required by 40 CFR Section 403.8(f)(2)(viii).

In addition, on or before March 28, the Permittee shall submit a pretreatment program annual report to the Approval Authority and the state permitting authority that contains the information requested by EPA, or at a minimum the following information:

i. An updated list of all SIUs as defined at 40 CFR 403.3(v). For each SIU listed the following information shall be included:

(A) All applicable Standard Industrial Classification (SIC) codes and categorical determinations, as appropriate. In addition, a brief description of the industry and general activities;

(B) Permit status. Whether each SIU has an unexpired control mechanism and an explanation as to why any SIUs are operating without a current, unexpired control mechanism (e.g. permit);

(C) A summary of all monitoring activities performed within the previous twelve (12) months. The following information shall be reported:

Total number of SIUs inspected; and
Total number of SIUs sampled.

ii. For all industrial users that were in Significant Non-Compliance during the previous twelve (12) months, provide the name of the violating industrial user; indicate the

nature of the violations, the type and number of actions taken (administrative order, criminal or civil suit, fines or penalties collected, etc.) and current compliance status. Indicate if the company returned to compliance and the date compliance was attained. Determination of Significant Non-Compliance shall be performed as defined at 40 CFR Section 403.8(f)(2)(viii)(A-H).

iii. A summary of all enforcement actions not covered by the paragraph above conducted in accordance with the approved Enforcement Response Plan, as required in 40 CFR, Section 403.8(f)(5).

iv. A list of all SIUs whose authorization to discharge was terminated or revoked during the preceding twelve (12) month period and the reason for termination;

v. A report on any Interference, Pass Through, upset or NPDES permit violations known or suspected to be caused by non-domestic discharges of pollutant and actions taken by the Permittee in response;

vi. Verification of publication of industrial users in Significant Non-Compliance;

vii. Identification of the specific locations, if any, designated by the Permittee for receipt (discharge) of trucked or hauled waste, if modified;

viii. Information as required by the Approval Authority or state permitting authority on the discharge to the POTW from the following activities:

(A) Ground water clean-up from underground storage tanks;
(B) Trucked or hauled waste; and,
(C) Groundwater clean-up from RCRA or Superfund sites.

ix. A description of all changes made during the previous calendar year to the Permittee's pretreatment program that were not submitted as substantial or non substantial modifications to EPA.

x. The Permittee shall evaluate actual pollutants loadings against the approved Maximum Allowable Headworks Loadings (MAHLs). Where the actual loading exceeds the MAHL, the Permittee shall immediately begin a program to either revise the existing local limit and/or undertake such other studies as necessary to evaluate the cause(s) of the exceedence. The Permittee shall provide a summary of its intended action.

xi. Other information that may be deemed necessary by the Approval Authority.

g. The Permittee shall prohibit the introduction of the following pollutants into the POTW:

i. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than sixty (60) degrees Centigrade (140 degrees Fahrenheit) using

the test methods specified in 40 CFR Section 261.21;

ii. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works are specifically designed to accommodate such discharges;

iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, or other interference with the operation of the POTW;

iv. Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;

v. Heat in amounts which will inhibit biological activity in the POTW resulting in Interference but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds forty (40) degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;

vi. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through;

vii. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;

viii. Any trucked or hauled pollutants, except at discharge points designated by the POTW; and,

ix. Any specific pollutant that exceeds a local limitation established by the POTW in accordance with the requirements of 40 CFR Section 403.5(c) and (d).

x. Any other pollutant which may cause Pass Through or Interference.

h. The Permittee shall provide the pretreatment Approval Authority with adequate notice of any substantial change in the volume or character of pollutants being introduced into the treatment works by any SIU introducing pollutants into the treatment works at the time of application for the discharge permit. For the purposes of this section, "substantial change" shall mean a level of change which has a reasonable probability of affecting the Permittee's ability to comply with its permit conditions or to cause a violation of stream standards applied to the receiving water.

Adequate notice shall include information on: (1) the quality and quantity of effluent to be introduced into the treatment works, and (2) any anticipated impact of the change on the quality or quantity of effluent to be discharged from the publicly owned treatment works.

i. Section 309(f) of the Act provides that EPA may issue a notice to the POTW stating that

a determination has been made that appropriate enforcement action must be taken against an industrial user for noncompliance with any Pretreatment Standards and requirements. The notice provides the POTW with thirty (30) days to commence such action. The issuance of such permit notice shall not be construed to limit the authority of the permit issuing authority or Approval Authority.

j. The state permitting authority and/or the EPA retains, at all times, the right to take legal action against the industrial contributor for violations of a permit issued by the Permittee, violations of any Pretreatment Standard or requirement, or for failure to discharge at an acceptable level under national standards issued by EPA under 40 CFR, chapter I, subchapter N. In those cases where a NPDES permit violation has occurred because of the failure of the Permittee to properly develop and enforce Pretreatment Standards and requirements as necessary to protect the POTW, the state permitting authority and/or Approval Authority shall hold the Permittee responsible and may take legal action against the Permittee as well as the Indirect Discharger(s) contributing to the permit violation.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling

Samples taken in compliance with the monitoring requirements established under Part I shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to use-disposal practice.

B. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under Part 136, Title 40 of the Code of Federal Regulations, unless other test procedures have been specified in this permit. See Part I.C. for any applicable sludge monitoring procedures. All flow-measuring and flow-recording devices used in obtaining data submitted in self-monitoring reports must indicate values within 10 percent of the actual flow being measured.

C. Penalties for Tampering

The Montana Water Quality Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000, or by imprisonment for not more than six months, or by both.

D. Reporting of Monitoring Results

Effluent monitoring results obtained during the previous month(s) shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the "Signatory Requirements" (see Part IV.G of this permit), and submitted to the Department at the following address:

Montana Department of
Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, Montana 59620- 0901
Phone: (406) 444-3080

E. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using approved analytical methods as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

G. Records Contents

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;

2. The initials or name(s) of the individual(s) who performed the sampling or measurements;

3. The date(s) analyses were performed;

4. The time analyses were initiated;

5. The initials or name(s) of individual(s) who performed the analyses;

6. References and written procedures, when available, for the analytical techniques or methods used; and

7. The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.

H. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time. Data collected on site, copies of Discharge Monitoring Reports, and a copy of this MPDES permit must be maintained on site during the duration of activity at the permitted location.

I. Twenty-four Hour Notice of Noncompliance Reporting

1. The permittee shall report any serious incident of noncompliance affecting the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the Water Protection Bureau at (406) 444-3080 or the Office of Disaster and Emergency Services at (406) 841-3911. The following examples are considered serious incidents:

a. Any noncompliance which may seriously endanger health or the environment;

b. Any unanticipated bypass which exceeds any effluent limitation in the permit (See Part III.G of this permit, "Bypass of Treatment Facilities"); or

c. Any upset which exceeds any effluent limitation in the permit (See Part III.H of this permit, "Upset Conditions").

2. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

3. The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Water Protection Bureau, by phone, (406) 444-3080.

4. Reports shall be submitted to the addresses in Part II.D of this permit, "Reporting of Monitoring Results".

J. Other Noncompliance Reporting

Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for Part II.D of this permit are submitted. The reports shall contain the information listed in Part II.I.2 of this permit.

K. Inspection and Entry

The permittee shall allow the head of the Department or the Regional Administrator, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give the Department advance notice of any planned changes at the permitted facility or of an activity which may result in permit noncompliance.

B. Penalties for Violations of Permit Conditions

The Montana Water Quality Act provides that any person who violates a permit condition of the Act is subject to civil or criminal penalties not to exceed $25,000 per day or one year in prison, or both, for the first conviction, and $50,000 per day of violation or by imprisonment for not more than two years, or both, for subsequent convictions. MCA 75-5-611(a) also provides for administrative penalties not to exceed $10,000 for each day of violation and up to a maximum not to exceed $100,000 for any related series of violations. Except as provided in permit conditions on Part III.G of this permit, "Bypass of Treatment Facilities" and Part III.H of this permit, "Upset Conditions", nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense

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

D. Duty to Mitigate

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

E. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit. However, the permittee shall operate, as a minimum, one complete set of each main line unit treatment process whether or not this process is needed to achieve permit effluent compliance.

F. Removed Substances

1. Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge shall not be directly blended with or enter either the final plant discharge and/or waters of the United States.

2. Any sludges removed from the facility shall be disposed of in accordance with 40 CFR 503, 258 or other applicable rule. EPA and MDEQ shall be notified at least 180 days prior to such disposal taking place.

3. The permittee shall provide certification that all applicable provisions of 40 CFR Parts 503 and 258 have been met for the land application or landfill disposal of sewage sludge. Certification shall be submitted annually with the sludge reporting form and must contain the following statement:

   "I certify under penalty of law, that all of the applicable provisions of 40 CFR Part (503/258) have been met when municipal sewage sludge is (beneficially used/disposed of at a landfill). This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that 40 CFR Part (503/258) have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

G. Bypass of Treatment Facilities

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts III.G.2 and III.G.3 of this permit.

2. Notice:

   a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

   b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required under Part II.I of this permit, "Twenty-four Hour Reporting".

3. Prohibition of bypass:

   a. Bypass is prohibited and the Department may take enforcement action against a permittee for a bypass, unless:

      (1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

      (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

      (3) The permittee submitted notices as required under Part III.G.2 of this permit.

   b. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in Part III.G.3.a of this permit.

H. Upset Conditions

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of Part III.H.2 of this permit are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review (i.e. Permittees will have the opportunity for a judicial determination on any claim of upset only in an enforcement action brought for noncompliance with technology-based permit effluent limitations).

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that the permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The permittee submitted notice of the upset as required under Part II.I of this permit, "Twenty-four Hour Notice of Noncompliance Reporting"; and

d. The permittee complied with any remedial measures required under Part III.D of this permit, "Duty to Mitigate".

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

IV. GENERAL REQUIREMENTS

A. Planned Changes

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

1. The alteration or addition could significantly change the nature or increase the quantity of pollutant discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit; or

2. There are any planned substantial changes to the existing sewage sludge management practices of storage and disposal. The permittee shall give the Department notice of any planned changes at least 180 days prior to their implementation.

B. Anticipated Noncompliance

The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Permit Actions

This permit may be revoked, modified and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application must be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information

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

F. Other Information

When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it shall promptly submit such facts or information with a narrative explanation of the circumstances of the omission or incorrect submittal and why they weren't supplied earlier.

G. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is considered a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Department; and

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or an individual occupying a named position.)

3. Changes to authorization. If an authorization under Part IV.G.2 of this permit is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV.G.2 of this permit must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

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

H. Penalties for Falsification of Reports

The Montana Water Quality Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document

submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more that $25,000 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports

Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. As required by the Clean Water Act, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

K. Property or Water Rights

The issuance of this permit does not convey any property or water rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability

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

M. Transfers

This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Department at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them;

3. The Department does not notify the existing permittee and the proposed new permittee of an intent to revoke or modify and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part IV.M.2 of this permit; and

4. Required annual and application fees have been paid.

N. Fees

The permittee is required to submit payment of an annual fee as set forth in ARM 17.30.201. If the permittee fails to pay the annual fee within 90 days after the due date for the payment, the Department may:

1. Impose an additional assessment consisting of 20% of the fee plus interest on the required fee computed at the rate of 12% per year, or

2. Suspend the processing of the application for a permit or authorization or, if the nonpayment involves an annual permit fee, suspend the permit, certificate or authorization for which the fee is required. The Department may lift suspension at any time up to one year after the suspension occurs if the holder has paid all outstanding fees, including all penalties, assessments and interest imposed under this sub-section. Suspensions are limited to one year, after which the permit will be terminated.

O. Reopener Provisions

This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations (and compliance schedule, if necessary), or other appropriate requirements if one or more of the following events occurs:

1. Water Quality Standards: The water quality standards of the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. Water Quality Standards are Exceeded: If it is found that water quality standards or trigger values in the receiving stream are exceeded either for parameters included in the permit or others, the department may modify the effluent limits or water management plan.

3. TMDL or Wasteload Allocation: TMDL requirements or a wasteload allocation is developed and approved by the Department and/or EPA for incorporation in this permit.

4. Water Quality Management Plan: A revision to the current water quality management plan is approved and adopted which calls for different effluent limitations than contained in this permit.

5. Sewage Sludge: There have been substantial changes (or such changes are planned) in sludge use or disposal practices; applicable management practices or numerical limitations for pollutants in sludge have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittee's sludge use or disposal practices do not comply with existing applicable state or federal regulations.

V. DEFINITIONS

1. **"Act"** means the Montana Water Quality Act, Title 75, chapter 5, MCA.

2. **"Administrator"** means the administrator of the United States Environmental Protection Agency.

3. **"Acute Toxicity"** occurs when 50 percent or more mortality is observed for either species (See Part I.C of this permit) at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the effluent results to be considered valid.

4. **"Annual Average Load"** means the arithmetic mean of all 30-day or monthly average loads reported during the calendar year for a monitored parameter.

5. **"Arithmetic Mean" or "Arithmetic Average"** for any set of related values means the summation of the individual values divided by the number of individual values.

6. **"Average Monthly Limitation"** means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

7. **"Average Weekly Limitation"** means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

8. **"BOD_5"** means the five-day measure of pollutant parameter biochemical oxygen demand.

9. **"Bypass"** means the intentional diversion of waste streams from any portion of a treatment facility.

10. **"$CBOD_5$"** means the five-day measure of pollutant parameter carbonaceous biochemical oxygen demand.

11. **"Composite Samples"** shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

    a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

c. Constant sample volume, time interval between samples proportional to flow (i.e. sample taken every "X" gallons of flow); and,

d. Continuous collection of sample, with sample collection rate proportional to flow rate.

12. **"Daily Discharge"** means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonable represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.

13. **"Daily Maximum Limit"** means the maximum allowable discharge of a pollutant during a calendar day. Expressed as units of mass, the daily discharge is cumulative mass discharged over the course of the day. Expressed as a concentration, it is the arithmetic average of all measurements taken that day.

14. **"Department"** means the Montana Department of Environmental Quality (MDEQ) established by 2-15-3501, MCA.

15. **"Director"** means the Director of the Montana Department of Environmental Quality.

16. **"EPA"** means the United States Environmental Protection Agency.

17. **"Federal Clean Water Act"** means the federal legislation at 33 USC 1251, *et seq.*

18. **"Geometric Mean"** means the value obtained by taking the Nth root of the product of the measured values.

19. **"Grab Sample"** means a sample which is taken from a waste stream on a one-time basis without consideration of flow rate of the effluent or without consideration for time.

20. **"Indirect Discharge"** means the introduction of pollutants into a POTW from any non-domestic source regulated under Section 307(b), (c) or (d) of the Federal Clean Water Act.

21. **"Industrial User"** means a source of Indirect Discharge.

22. **"Instantaneous Maximum Limit"** means the maximum allowable concentration of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.

23. **"Instantaneous Measurement"**, for monitoring requirements, means a single reading, observation, or measurement.

24. **"Interference"** means a discharge which, alone or in conjunction with other contributing discharges

    a. Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and

    b. Therefore causes a violation of any requirement of the POTW's MPDES permit (including an increase in the magnitude or duration of a violation) or causes the prevention of sewage sludge use or disposal in compliance with the following statutes and regulations: Section 405 of the Clean Water Act; 40 CFR Part 503 - Standards for the Use and Disposal of Sewage Sludge; Resource Conservation and Recovery Act (RCRA); 40 CFR Part 258 - Criteria for Municipal Solid Waste Landfills; and/or any State regulations regarding the disposal of sewage sludge.

24. **"Maximum Daily Discharge Limitation"** means the highest allowable daily discharge.

25. **"Mixing Zone"** means a limited area of a surface water body or aquifer where initial dilution of a discharge takes place and where certain water quality standards may be exceeded.

26. **"Nondegradation"** means the prevention of a significant change in water quality that lowers the quality of high-quality water for one or more parameters. Also, the prohibition of any increase in discharge that exceeds the limits established under or determined from a permit or approval issued by the Department prior to April 29, 1993.

27. **"Pass Through"** means a discharge which exits the POTW into waters of the State of Montana in quantities or concentrations which, alone or in conjunction with other discharges, is a cause of a violation of any requirement of the POTW's MPDES permit (including an increase in the magnitude or duration of a violation).

28. **"POTW"** means a publicly owned treatment works.

29. **"Regional Administrator"** means the administrator of Region VIII of EPA, which has jurisdiction over federal water pollution control activities in the state of Montana.

30. **"Severe Property Damage"** means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

31. **"Sewage Sludge"** means any solid, semi-solid or liquid residue generated during the treatment of domestic sewage and/or a combination of domestic sewage and industrial waste of a liquid nature in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the incineration of sewage sludge or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

32. **"TIE"** means a toxicity identification evaluation.

33. **"TMDL"** means the total maximum daily load limitation of a parameter, representing the estimated assimilative capacity for a water body before other designated uses are adversely affected. Mathematically, it is the sum of wasteload allocations for point sources, load allocations for non-point and natural background sources, and a margin of safety.

34. **"TRE"** means a toxicity reduction evaluation.

35. **"TSS"** means the pollutant parameter total suspended solids.

36. **"Upset"** means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Montana Department of Environmental Quality

CIRCULAR DEQ-7

MONTANA NUMERIC WATER QUALITY STANDARDS

May 2017

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INTRODUCTION

The Department of Environmental Quality (Department) Circular DEQ-7 (DEQ-7) contains numeric water quality standards for Montana's surface and ground waters. The standards were developed in compliance with Section 75-5-301, Montana Code Annotated (MCA) of the Montana Water Quality Act, Section 80-15-201, MCA (the Montana Agricultural Chemical Groundwater Protection Act), and Section 303(c) of the Federal Clean Water Act (CWA). Together, these provisions of state and federal law require the adoption of narrative and numeric standards that will protect the designated beneficial uses of state waters, such as growth and propagation of fishes and associated wildlife, waterfowl and furbearers, drinking water, culinary and food processing purposes, recreation, agriculture, and industry and other commercial purposes.

DEQ-7 contains a great deal of information about Montana's numeric standards in a compact form. In addition to providing the numeric water quality standards for each parameter, DEQ-7 also contains the following:

- The primary synonyms of each parameter. This section also includes any identification numbers used by the U.S. Environmental Protection Agency (EPA), such as the Resource Conservation and Recovery Act (RCRA) waste number, if available, as the last entry in the synonyms section;
- the Chemical Abstracts Service Registry Number (CASRN) for each chemical, as well as the National Institute for Occupational Safety and Health (NIOSH);
- the categorization of each parameter according to the type of pollutant;
- the bioconcentration factor, if known;
- trigger values used to determine "non-significant changes in water quality" under Montana's nondegradation policy (ARM 17.30.701-718); and
- required reporting values (RRV). See footnote 19 for a further explanation of RRV usage.

The numeric water quality standards in DEQ-7 have been established for parameters (i.e., "pollutants") in five categories: toxic, carcinogenic, radioactive, nutrients and harmful. An explanation of each of these categories is given below under "Explanation of Terms".

Parameters are listed in alphabetical order. In order to facilitate listing by alphabetical order, parameters that are normally written with the numbers first are listed with the numbers last. For example, 2,4-Dinitrophenol is listed as Dinitrophenol, 2,4-.

There are many explanatory notes following the table portion of DEQ-7. Footnotes referencing the explanatory notes are found in both the table headings and in individual line items. The notes following the table explain various aspects of the standards. For example, the standards for some metals, ammonia, and dissolved oxygen cover a range of values that are computed by using tables or formulas, using such parameters as pH, hardness, or temperature.

The Department will provide hard copies of this document upon request or the document may be retrieved from the Department website at, http://deq.mt.gov/Portals/112/Water/WQPB/Standards/PDF/DEQ7/FinalApprovedDEQ7.pdf . Use of an electronic copy will enable the reader to search for synonyms or CASRN. Such searches will make this document easier to use. Please note that when searching for a chemical with a hyphenated name, a dash must be used in the name as hyphens are not recognized in the pdf search function.

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Standards Development

Montana's numeric water quality standards were developed using guidance from the EPA which includes:

- National Recommended Water Quality Criteria (NRWQC)[1] for the protection of human health and aquatic life, developed under Section 304(a) of the CWA. These include criteria for priority pollutants (PP), non-priority Pollutants (NPP), and organoleptic pollutants (OL); and
- Drinking Water Health Advisories (HA) and Maximum Contaminant Levels (MCLs) developed under the Safe Drinking Water Act.[2]

The 2016 versions of NRWQC and the "2012 Edition of the Drinking Water Standards and Health Advisories" were used to develop the standards in this version of DEQ-7.

Aquatic life criteria take into consideration the magnitude (how much of a pollutant is allowable), duration of exposure to the pollutant (averaging period), and frequency (how often criteria can be exceeded). Acute criteria are based on a one hour exposure event and can only be exceeded once, on average, in a three year period. Chronic criteria are based on a 96 hour exposure and can only be exceeded, on average, once in a three year period. For more information, see EPA's ***Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses***.[3] The techniques used for determining aquatic life numeric standards are complex and take a great deal of time to develop. They require a detailed accumulation of scientific evidence from multiple studies, reviewed by experts in their field that may take years to complete. Aquatic life standards are added to DEQ-7 as they become available.

Nutrients in the aquatic environment are essential substances (organic or inorganic) which are used by living organisms such as algae or bacteria for cellular metabolism or construction. Examples include nitrogen (typically as ammonia, nitrate, or nitrite) and phosphorus. If present in excessive amounts (which depends on the ecosystem involved), nutrients can produce excessive algal and plant growth, which can lead to undesirable deterioration of beneficial uses of state waters. Numeric nutrient standards for aquatic life and recreation are not included in DEQ-7, but are addressed in DEQ Circular 12. The human health standards for nitrogenous compounds are found in DEQ-7 and are listed as toxic compounds.

Human health criteria also have a magnitude, duration and frequency component. The standard assumption in calculating the magnitude of the pollutant for groundwater exposure is that an 80 kg person will consume 2.4 liters a day for 70 years. Water consumption is assumed to be the only route of exposure in that time frame. For surface water criteria, two routes of exposure are considered, water consumption and fish consumption. EPA and the Department use a fish consumption rate of 22 grams of fish per day.

Other publications used by the Department in the development of standards include: the *1986 Quality Criteria for Water*, EPA 440/5/86-001 (the "Gold Book") and numerous updates; *Toxics Criteria for those States not Complying with Clean Water Act* 303(c)(2)(B); *The National Toxics Rule* [NTR], which was published in the Code of Federal Regulations, 40 CFR 131.36 (1992); and *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California*, 62 F.R. 42159 [1997].

EXPLANATION OF TERMS

Toxics: A toxin is any chemical which has an immediate, deleterious effect on the metabolism of a living organism. The surface water quality standards for human health toxins are the more restrictive of either the MCL or the NRWQC. The ground water standards for human health toxins are the drinking water MCL or, if an

[1] See http://www.epa.gov/waterscience/criteria/wqctable/

[2] See https://www.epa.gov/dwstandardsregulations/drinking-water-contaminant-human-health-effects-information#dw-standards

[3] Available at: http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/

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MCL is not available, the NRWQC criteria. If neither an MCL nor an NRWQC criteria is available, an HA will be developed by the Department with the aid of the regional EPA toxicologist.

Carcinogens: The Montana Water Quality Act requires that human health standards for carcinogens be the more restrictive of either of the following: (1) the risk-based level of one in one hundred thousand [$1x10^{-5}$] for all carcinogens except arsenic, which is based upon one in one thousand [$1x10^{-3}$]; or, (2) the MCL. For surface water, the risk-based levels in EPA's NRWQC criteria or the MCL was used, or if not available HA information was used. In cases where a risk based level was not available, the most recent oral reference dose (RfD) or cancer potency factor (q1*) in the Integrated Risk Information System (IRIS) was used to compute the standard. In cases where no risk-based levels were available for known carcinogens, the standards in DEQ-7 are based on toxic effects. Ground water standards are based on EPA Drinking Water MCLs or HAs, NRWQC criteria, or IRIS information.

Pesticides: The Montana Agricultural Chemical Ground Water Protection Act requires that federal water quality criteria be adopted as ground water standards for pesticides if they are available. Pesticides are not a separate category in DEQ-7, but are included in either the toxic or carcinogenic categories. The criteria derivation would follow the process described above for those categories. If no MCLs or other federal criteria are available, standards must be developed using available data on health effects RfD and standard assumptions. The standard assumptions are that 2.4 liters of water are consumed per day and that adults weighing 80 kilograms are exposed for 70 years (life-long exposure) to a single source of water. When information was available, a relative source contribution (RSC) factor was also applied. The RSC is the percentage of a parameter's intake through drinking water versus other dietary sources. A RSC of 0.2 was used in most cases to develop ground water standards for pesticides. In some cases, no data was available to develop a water quality standard for a pesticide in surface water. In these cases, the ground water standard (developed for a pesticide according to the risk-based analysis provided above) was also adopted as a surface water standard. Other federal data sources were used when the EPA's most recent drinking water regulations and health advisories did not include data for a pesticide.

Bioconcentration: Bioconcentration factors (BCF) are not a separate category in DEQ-7, but are included with each pollutant for which there is a known bioconcentration effect. Bioconcentration is a biological amplification process which results in a higher concentration of a pollutant in a living organism than in the environment to which the organism is exposed. Pollutants such as mercury can be hundreds of times more concentrated in fish tissues than in the water the fish lives in. The calculation of a BCF is complex and is dependent on the age of the organism and the chemistry of its environment. A detailed discussion of bioconcentration can be found in EPA 823-B-94-004 *Guidance for Assessing Chemical Contaminant Data for use in Fish Advisories.*

The human health standards for carcinogens and other parameters that exhibit bioconcentration were developed using the assumption that there are two routes of human exposure: through consumption of water and fish. EPA's water quality criteria are derived using an average fish consumption rate of 22 grams/day and water consumption of 2.4 liters per day. The Department follows the EPA guidance for fish consumption rates.

Radioactive: All elements that emit alpha, beta, or gamma radiation are regulated in ground water by the EPA. As all forms of radiation are carcinogenic, the calculation of a numeric standard is derived either from MCLs set by the EPA or calculated from the Oral Cancer Slope Factor (OCSF) provided by the EPA Region VIII toxicologist, the use of a risk based level of one in one hundred thousand ($1x10^{-5}$) and the consumption of 2.4 liters of water daily for 70 years for an adult weighing 80 kilograms. Unlike pesticides, a relative source correction (RSC) is not applied to the calculation of numeric standards for radioactive substances as discussed in EPA 402-R-11-001, *EPA Radiogenic Cancer Risk Models and Projections.*

Harmful: Pollutants typically classified as harmful include substances or measures which are controlled by numeric standards. Examples of harmful numeric standards are iron and *Escherichia coli*.

Required Reporting Value: Each pollutant's required reporting value (RRV) is the Department's selection of a laboratory reporting limit that can be met by the majority of local laboratories. In most cases, the RRV is sufficiently sensitive to meet the most stringent numeric water quality standard. The Department's RRV calculation is modified from EPA Guidance 821-B-04-005, "Revised Assessment of Detection and Quantitation Approaches," and uses method detection limits (MDLs) provided by laboratories. An MDL, as defined in 40 CFR 136 Appendix B, is "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte." EPA's guidance is based on MDL studies conducted at individual labs and recommends multiplying the MDL by 3.18 to calculate the RRV. Since the Department calculates RRVs based on an inter-laboratory study, the guidance has been modified to use the 75th percentile of the MDLs from the labs multiplied by 3.18.

Because DEQ-7 contains numeric standards for pollutants regulated under 40 CFR 136, EPA's Safe Drinking Water Act (SDWA), and EPA's Office of Pesticides, MDLs used to calculate RRVs in DEQ-7 include those from methods in 40 CFR 136 Appendix A, EPA's SDWA methods, and select methods approved by EPA for the analysis of pesticides. It is the responsibility of the sampling entity to ensure that appropriate methods and reporting limits are requested from the laboratory to meet analytical and reporting limit needs. For pollutants with low standards and RRVs, the Department realizes that the RRVs may be below the laboratory's lowest calibration standards. In these cases, laboratories are encouraged to report values down to the RRV when possible, and to qualify data reported below their lowest calibration standard.

RULES CONTAINING MONTANA'S WATER QUALITY STANDARDS

The Administrative Rules of Montana (ARM), 17.30.620 through 17.30.670, contain numeric surface water quality standards that vary with each stream classification. Additionally, both Montana's surface water and ground water rules contain narrative standards (ARM 17.30.620 through 17.30.670 and ARM 17.30.1001 through 17.30.1045). The narrative standards cover a number of parameters, such as alkalinity, chloride, hardness, sediment, sulfate, and total dissolved solids for which sufficient information does not yet exist to develop specific numeric standards. These narrative standards are directly translated to protect beneficial uses from adverse effects, supplementing the existing numeric standards.

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CIRCULAR DEQ-7, MONTANA NUMERIC WATER QUALITY STANDARDS (9)

No number indicates that a standard has not been adopted or information is currently unavailable. A '( )' indicates that a detailed footnote of explanation is provided.

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Acenaphthene §§ § 3Acenaphthalene § Naphthyleneethylene § 1,8-Ethylenenaphthalene § 1,8-Ethylene Naphthalene § 1,2-Dihydroacenphthylene § Acenphthylene, 1,2-Dihydro-	83-32-9 AB 1255500	Toxic			242	70 PP	70 PP		10
Acetochlor (30) §§ § Acenit § Azetochlor § C10925 § Erunit § Harness § MG 02 § MON 097 § Nevirex	34256-82-1	Toxic				100 HA	100 HA		0.4
Acifluorfen §§ Blazer § Tackle § Scepter § as sodium salt	62476-59-9	Carcinogen				9.4 HA	9.4 HA	N/A	0.5
Acrolein §§ Aqualine § Biocide § Crolean § Aqualin § Propenal § SHA 00701 § 2-propenal § Acraldehyde § Acrylaldehyde § Acrylic Aldehyde § Ethylene Aldehyde	107-02-8 AS 1050000	Toxic	3 PP	3 PP	215	3 PP	3 PP	N/A	3
Acrylamide §§ 2-Propenamide § Propenamide§ Acrylic Amide § Ethylenecarboxamide § RCRA Waste Number U007	79-06-1 AS 3325000	Carcinogen				0.7 HA	0.7 HA	N/A	0.008

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Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Acrylonitrile §§ Fumigrain § Ventox § ENT 54 § TL 314 § Carbacryl § Cyanoethylene § Vinyl cyanide § Propenenitrile § 2-Propenenitrile § Acrylonitrile monomer § RCRA Waste Number U009	107-13-1 AT 5250000	Carcinogen			30	0.61 PP	0.61 PP	N/A	3
Alachlor (includes metabolites Alachlor ESA and Alachlor OA) (31) §§ Lasso § Lazo § Alator § Alanex § Alochlor § Pillarzo § Metachlor § Chimiclor § SHA 090501 § Methachlor § 2-Chloro-N-(2,6-Diethyl)Phenyl-N-Methoxymethylacetamide § 2-Chloro-2',6'-Diethyl-N-(Methoxymethyl) Acetanilide	15972-60-8 AE 1225000	Toxic				2 MCL	2 MCL		0.3
Aldicarb (37) §§ Temik § Temic § Ambush § OMS 771 § Temik G 10 § Aldecarb § Carbamyl § SHA 098301 § Carbanolate § Sulfone Aldoxycarb § Union Carbide 21149 § § Propanal, 2-Methyl-2-(Methylthio)-, O-[(Methylamino)Carbonyl] Oxime RCRA Waste Number P070	116-06-3 UE 2275000	Toxic				3 MCL	3 MCL	1	0.4

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Aldicarb Sulfone (37) §§ Aldoxycarb § Standak § UC 21865 § Sulfocarb § SHA 110801 § Propionaldehyde, 2-Methyl-2-(Methylsulfonyl)-, O-(Methylcarbomoyl)Oxime § 2-Methyl-2-(Methylsulfonyl) Propanal O-[(Methylamino)Carbonyl] Oxime	1646-88-4 UE 2080000	Toxic				2 MCL	2 MCL	2	0.5
Aldicarb Sulfoxide (37) §§	1646-87-3	Toxic				4 MCL	4 MCL	2	0.4
Aldrin §§ § HHDN § Altox § Drinox § Aldrex § Aldrite § Seedrin § Octalene § SHA 045101 § Hexachlorohexahydro-endo-exo-Dimethanonaphthalene § 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8, 8a-Hexahydro-1,4,5,8-Dimethanonaphthalene § 1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-Hexahydro-endo,exo- § 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-Hexa-Hydro-1,4:5,8-Endo,Exo-Dimethanonaphthalene § RCRA Waste Number P004	309-00-2 IO 2100000	Carcinogen	1.5 PP		4,670	$7.7x10^{-6}$ PP	0.02 HA	N/A	0.1
Alpha Emitters (11) §§ § Gross Alpha § Adjusted Gross Alpha § Gross Alpha Emitters	Multiple	Carcinogen / Radioactive				15 picoC/ liter MCL	15 picoC/ liter MCL	N/A	

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
alpha-Chlordane §§ -Chlordane § cis-Chlordan § cis-Chlordane § c (cis)-Chlordane § Chlordane, cis-Isomer	5103-71-9 PB 9705000	Carcinogen			14,100	0.008 HA	1 HA	N/A	0.006
alpha-Hexachlorocyclohexane §§ § a-BHC § alpha-BHC § HCH-alpha § alpha-HCH § alpha-Lindane § a Hexachlorocyclohexane § alpha-Benzenehexachloride § alpha-Hexachlorocyclohexane § Benzene Hexachloride-alpha-isomer § alpha-1,2,3,4,5,6-Hexachlorocyclohexane § Cyclohexane, alpha-1,2,3,4,5,6-Hexachloro- § 1-alpha,2-alpha,3-beta,4-alpha,5-beta,6-beta-Hexachlorocyclohexane § Cyclohexane, alpha-1,2,3,4,5,6-Hexachloro-, (1-alpha, 2-alpha, 3-beta, 4-alpha, 5-beta, 6-beta)-	319-84-6 GV 3500000	Carcinogen			130	0.0036 PP	0.0036 PP	N/A	0.03
Aluminum, dissolved, pH 6.5 to 9.0 only §§ Al	7429-90-5 BD 0330000	Toxic	750 NPP	87 NPP				30	9
Ametryn §§ Ametrex	834-12-8	Toxic				60 HA	60 HA		6
Aminomethylphosphonic Acid (AMPA) § Glyphosate metabolite §§		Toxic				2,000 HA	2,000 HA		200
Aminopyralid § 4-amino-3,6-dichloropyridine-2carboxilic acid, § 4 amino-3,6 dichlro-2-pyridinecarboxilic acid § Milestone	150114-71-9	Toxic				3,000 HA	3,000 HA		0.2

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Ammonia [total ammonia nitrogen (NH3-N plus NH4-N)] as ug/L N §§ § Ammonia Anhydrous § Anhydrous Ammonia § Spirit of Hartshorn	7664-41-7 BO 0875000	Toxic	(7)(8) NPP	(7)(8) NPP				10	70
Ammonium Sulfamate §§	7773-06-0	Toxic				1,000 HA	1,000 HA		200
Anthracene (PAH) §§ Paranaphthalene § Green Oil § Anthracin § Tetra Olive N2G	120-12-7 CA 9350000	Toxic			30	300 PP	2,100 HA	0.04	10
Antimony §§ Sb § Antimony Black § Antimony Regulus § C.I. 77050 § Stibium	7440-36-0 CC 4025000	Toxic			1	5.6 PP	6 MCL	0.4	0.5
Arsenic (36) §§ As § Arsenicals § Arsenic-75 § Arsenic Black § Colloidal Arsenic § Grey Arsenic § Metallic Arsenic	7440-38-2 CG 0525000	Carcinogen	340 PP	150 PP	44	10 MCL	10 MCL	N/A	1
Asbestos, fibers longer than 10 microns in length §§ § Amianthus § Amosite (Obs.) § Amphibole § Asbestos Fiber § Fibrous Grunerite § NCI CO8991 § Serpentine, includes Chrysotile, Actinolite, Aurosite, Anthophyllite, Crocidolite, and Tremolite	Multiple	Carcinogen				$7x10^6$ fibers /liter MCL	$7x10^6$ fibers/ liter MCL	N/A	

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Atrazine (includes metabolites deethyl atrazine, deisopropyl atrazine, and deethyl deisopropyl atrazine) (32) §§ § Aatrex § Aktikon § Atrasine § Atred § Candex § Crisatrina § Crisazine§ Cyazin § Fenamin § Fenamine § Zeaphos § Fenatrol § Gesaprim § Hungazin § Inakor § Primatol § Malermais § Radazin § Radizine § Shell Atrazine herbicide § Strazine § Zeazine § SHA 080803 § 1-Chloro-3-Ethylamino-5-Isopropylamino-2,4,6-Triazine § s-Triazine, 2-Chloro-4-Ethylamino-6-Isopropylamino- § 2-Chloro-4-Ethylamino-6-Isopropylamino-s-Triazine	1912-24-9 XY 5600000	Toxic				3 MCL	3 MCL	0.1	0.3
Azinophos and degredate azinphos methyl oxon metiltriazotion § Azimil § Bay 9027 § Bay 17147 § Carfene § Cotnion-methyl § Gusathion § Gusathion-M§ Guthion § Methyl-Guthion	86-50-0	Toxic				10 HA	10 HA		0.1
Azoxystrobin §§ § azoksystrobin § Azoxistrobin § Azoxistrobina § Azoxystrobin (BSI, ISO) § azoxystrobine § Azoxystrolin	131860-33-8	Toxic				1,200 HA	1,200 HA		0.03
Barium §§ Ba	7440-39-3 CA 8370000	Toxic				1,000 NPP	1,000 NPP	2	3
Bentazon §§ § Basagran	25057-89-0	Toxic				210 HA	210 HA		3

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Benzene §§ § Phene § Benzol § Benzolene § Pyrobenzol § Carbon Oil § SHA 109301 § Coal Naphtha § Motor Benzol § Phenyl hydride § Cyclohexatriene C § Caswell Number 077 § EPA Pesticide Chemical Code 008801 § NCI C55276 § RCRA Waste Number U019	71-43-2 CY 1400000	Carcinogen			5.2	5 PP	5 MCL	N/A	0.6
Benzidine §§ § p,p'-Bianiline § 4,4'-Bianiline § 4,4'-Biphenyldiamine § p,p'-Diaminobiphenyl § 4,4'-Diaminodiphenyl § 4,4'-Biphenylenediamine § 4,4'-Diphenylenediamine § Biphenyl, 4,4'-Diamino- § 4,4'-Diamino-1,1'-Biphenyl § (1,1'-Biphenyl)-4,4'-Diamine § NCI C03361 § RCRA Waste Number U021	92-87-5 DC 9625000	Carcinogen			87.5	0.0014 PP	0.0014 PP	N/A	5
Benzo(g,h,i)perylene (PAH) §§ § 1,12-Benzoperylene § 1,12-Benzperylene § Benzo(ghi)Perylene	191-24-2 DI 6200500	Toxic			30			0.076	10
Benzo[a]Pyrene (PAH) §§ § BaP § 3,4-BP § Benz(a)Pyrene § Benzo-a-Pyrene § 3,4-Benzpyrene § 6,7-Benzopyrene § 3,4-Benzopyrene § 3,4-Benz(a)Pyrene § Benzo(d,e,f)Chrysene	50-32-8 DJ 3675000	Carcinogen			30	0.0012 PP	0.05 HA	N/A	0.06

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Benzo[b]Fluoranthene (PAH) §§ § B(b)F § Benzo(b)Fluoranthene § Benzo(e)Fluoranthene § 2,3-Benzfluoranthene § 3,4-Benzfluoranthene § 3,4-Benzofluoranthene § 2,3-Benzofluoranthene § 2,3-Benzofluoranthrene § Benz(e)Acephenanthrylene § 3,4-Benz(e)Acephenanthrylene	205-99-2 CU 1400000	Carcinogen			30	0.012 PP	0.5 (29) HA	N/A	5
Benzo[k]fluoranthene (PAH) §§ § Benzo(k)Fluoranthene § 8,9-Benzofluoranthene § Dibenzo(b,jk)Fluorene § 2,3,1'8'-Binaphthylene § 11,12-Benzofluoranthene § 11,12-Benzo(k)Fluoranthene	207-08-9 DF 6350000	Carcinogen			30	0.12 PP	5 (29) HA	N/A	0.1
Benzo[a]anthracene (PAH) §§ § Tetraphene § Benzanthracene § Benzoanthracene § Naphthanthracene § 1,2-Benzanthrene § Benz(a)Anthracene § Benzo(a)Anthracene § 1,2-Benzanthracene § Benzo(b)Phenanthrene § 1,2-Benzoanthracene § Benzanthracene, 1,2- § 1,2-Benz(a)Anthracene § 2,3-Benzophenanthrene § RCRA Waste Number U018	56-55-3 CV 9275000	Carcinogen			30	0.012 PP	0.5 (29) HA	N/A	0.1
Beryllium §§ Be § Beryllium-9 § Glucinum § RCRA Waste Number P015	7440-41-7 DS 1750000	Carcinogen			19	4 MCL	4 MCL	N/A	0.8

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Beta Emitters (11) §§ § Gross Beta	Multiple	Carcinogen / Radioactive				4 mrem /yr MCL	4 mrem /yr MCL	N/A	
Beta-Chloronaphthalene §§ 2-Chloronaphthalene § ß-Chloronaphthalene § Naphthalene, 2-Chloro- § 2 Chlornaftalen § A13-01537 § CCRIS 5995 § HSDB 4014 § Halowax § EINECS 202-079-9 § RCRA waste number U047	91-58-7 QJ 2275000	Toxic			202	800 PP	800 PP	0.94	10
beta-Hexachlorocyclohexane §§ § ß-BHC § beta-BHC § HCH-beta § beta-HCH § ß-Lindane § beta-Lindane § Hexachlorocyclohexane, beta- § trans-alpha-Benzenehexachloride § Cyclohexane, 1,2,3,4,5,6-Hexachloro-, beta- § 1-alpha,2-beta,3-alpha,4-beta,5-alpha,6-beta-Hexachlorocyclohexane § Cyclohexane, 1,2,3,4,5,6-Hexachloro-, (1-alpha, 2-beta, 3-alpha, 4-beta, 5-alpha, 6-beta)- § Benzenehexachloride, trans-alpha- § beta-1,2,3,4,5,6-Hexachlorocyclohexane	319-85-7 GV 4375000	Carcinogen			130	0.08 PP	0.08 PP	N/A	0.02

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Bis(2-Chloroisopropyl) Ether §§ § DCIP § NCI C50044 § Dichlorodiisopropyl Ether § 2,2'-Oxybis(1-Chloropropane) § Bis (2-Chloroisopropyl) ether § Propane, 2,2'-Oxybis(2-Chloro- § Propane, 2,2'-Oxybis[1-Chloro- § 2',2'-Dichlorodiisopropyl Ether § Dichlorodiisopropyl Ether (DOT) § Bis(2-Chloro-1-Methylethyl) Ether § RCRA Waste Number U027 Reregistration decision CAS-RN	108-60-1 KN 1750000 39638-32-9	Toxic			2.47	200 PP	200 PP	0.8	10
Bis(2-Chloroethoxy)Methane §§ § Bis(ß-Chloroethyl)Formal	111-91-1 PA 3675000	Toxic			0.64			0.5	10
Bis(Chloroethyl)Ether §§ § BCEE § DCEE § Clorex § Chlorex § Chloroethyl Ether § Dichloroethyl Ether § Dichloroethyl Oxide § Bis(Chloroethyl) Ether § Di(2-Chloroethyl) Ether § Bis (Chloroethyl) Ether § Bis(2-Chloroethyl) Ether § Bis(ß-Chloroethyl) Ether § ß,ß'-Dichloroethyl Ether § 2,2'-Dichloroethyl Ether § Bis (2-Chloroethyl) Ether § 1,1'-Oxybis(2-Chloro)Ethane § Ethane, 1,1'-Oxybis[2-Chloro- § beta,beta'-Dichloroethyl Ether § 1-Chloro-2-(beta-Chloroethoxy)Ethane § RCRA Waste Number U025	111-44-4 KN 0875000	Carcinogen			6.9	0.3 PP	0.3 PP	N/A	5

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Bis(Chloromethyl)ether §§ § BCME § bis-CME § Chloromethyl Ether § Oxybis(Chloromethane) § Bis (Chloromethyl) Ether § sym-Dichlorodimethyl Ether § 1,1'-Dichlorodimethyl Ether § Dimethyl-1,1'-Dichloroether § Chloro(Chloromethoxy) Methane § RCRA Waste Number P016	542-88-1 KN 1575000	Carcinogen			63	0.0015 NPP	0.0015 NPP	N/A	$1x10^{-4}$
Bromacil §§ Hyvar §	314-40-9	Carcinogen				700 HA	700 HA	N/A	0.03
Bromate	7789-38-0	Carcinogen				10 MCL	10 MCL	N/A	1
Bromodichloromethane (HM) §§ Dichlorobromomethane § BDCM § NCI C55243 § Methane, bromodichloro- § Dichloromonobromomethane § Monobromodichloromethane	75-27-4 PA 5310000	Carcinogen			3.75	9.5 PP	10 HA	N/A	0.6
Bromoform (HM) §§ Tribromomethane § NCI C55130 § Methane, Tribromo- § Methenyl Tribromide § RCRA Waste Number U225	75-25-2 PB 5600000	Carcinogen			3.75	70 PP	80 HA	N/A	5
Bromoxynil §§	1689-84-5	Carcinogen				3.2 HA	3.2 HA	N/A	0.3

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Butyl Benzyl Phthalate §§ § BBP § Sicol 160 § Unimoll BB § Palatinol BB § Santicizer 160 § Butylbenzylphthalate § Butylbenzyl Phthalate § Benzyl Butyl Phthalate § n-Benzyl Butyl Phthalate § Benzyl n-Butyl Phthalate § Phthalic Acid, Benzyl Butyl Ester § Butyl Phenylmethyl 1,2-Benzenedicarboxylate § 1,2-Benzenedicarboxylic Acid, Butyl Phenylmethyl Ester § NCI C54375	85-68-7 TH 9990000	Carcinogen			414	1 PP	1 PP	N/A	10
Butylate §§ Sutan §	2008-41-5	Toxic				300 HA	300 HA		0.02
Cadmium §§ Cd § C.I. 77180 § Colloidal Cadmium	7440-43-9 EU 9800000	Toxic	0.49 @25 mg/L hardness (12) PP	0.25 @25 mg/L hardness (12) PP	64	5 MCL	5 MCL	0.1	0.03
Carbaryl §§ Sevin §	63-25-2	Toxic	2.1 NP	2.1 NP		70 HA	70 HA	2	1
Carbofuran §§ § Yaltox § Euradan § Furadan § Curaterr § Furacarb § SHA 090601 § Niagra 10242 § 2,2-Dimethyl-7-Coumaranyl N-Methylcarbamate § 2,2-Dimethyl-2,3-Dihydro-7-Benzofuranyl N-Methylcarbamate § Carbamic Acid, Methyl-, 2,3-Dihydro-2,2-Dimethyl-7-Benzofuranyl Ester	1563-66-2 FB 9450000	Toxic				40 MCL	40 MCL	1	1

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Carbon Tetrachloride §§ Freon 10 § R 10 § Univerm § Tetrasol § Fasciolin § Flukoids § Necatorina § Necatorine § Halon 104 § Tetraform § Carbon Tet § Benzinoform § Carbon Chloride § Perchloromethane § Tetrachloromethane § Methane Tetrachloroide § RCRA Waste Number U211	56-23-5 FG 4900000	Carcinogen			18.75	4 PP	3 HA	N/A	0.6
Carboxin §§ Vitavax §	5234-68-4	Toxic				700 HA	700 HA	1	70
Chloramben §§ Vegiben §	133-90-4	Toxic				100 HA	100 HA		0.5
Chlordane §§ Termex § Belt § Niran § Dowchlor § Chlortox § Chlordan § Clordano § Chlor Kil § Toxichlor § Octa-Klor § Ortho-Klor § SHA 058201 § Gold Crest C-100 § Chlordane, Technical § Octachloro-4, 7-Methanohydroindane § Octachlorodihydrodicyclopentadiene § Octachloro-4,7-Methanotetrahydroindane -4,7-Methylene Indane § 4,7-Methanoindan, 1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro- § 4,7-Methano-1H-Indene § RCRA Waste Number U036	57-74-9 PB 9800000	Carcinogen	1.2 PP	0.0043 PP	14,100	0.0031 PP	1 HA	N/A	0.1
Chlorimuron Ethyl §§ Classic §	90982-32-4	Toxic				600 HA	600 HA	0.1	0.1

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Chlorine, total residual §§ Cl § Bertholite § Chlorine, molecular § Molecular Chlorine	7782-50-5 FO 2100000	Toxic	19 NPP	11 NPP		4,000 MCL	4,000 MCL		100
Chlorite	7758-19-2	Toxic				1,000 MCL	1,000 MCL		100
Chlorobenzene §§ Monochlorobenzene § MCB § Chlorobenzol § Chlorbenzene § Phenyl Chloride § Benzene Chloride § Benzene, Chloro- § Monochlorbenzene § NCI C54886 § RCRA Waste Number U037	108-90-7 CZ 0175000	Toxic			10.3	100 PP	100 MCL	0.5	0.8
Chlorodibromomethane §§ Monochlorodibromomethane § CDBM § NCI C55254 § Methane, Dibromochloro- § Dibromochloromethane (THM)	124-48-1 PA 6360000	Carcinogen			3.75	8 PP	8 PP	N/A	0.6
Chloroethane §§ Ethyl Chloride § Aethylis § Aethylis Chloridum § Anodynon § Chelen § Chlorethyl § Chloridum § Chloryl § Chloryl Anesthetic § Ether Chloratus § Ether Hydrochloric § Ether Muriatic § Hydrochloric Ether § Kelene § Monochlorethane § Muriatic Ether § Narcotile § NCI C06224	75-00-3 KH 7525000	Toxic						0.52	

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Chloroform (THM) §§ Trichloromethane § TCM § Freon 20 § Trichloroform § R-20 Refrigerant § Methenyl Chloride § Formyl Trichloride § Methyl Trichloride § Methane Trichloride § Methane, Trichloro- § Methenyl Trichloride § NCI CO2686§ RCRA Waste Number U044	67-66-3 FS 9100000	Carcinogen			3.75	60 PP	70 HA	N/A	0.9
Chlorophenol, 2- §§ Phenol, 2-Chloro § o-Chlorophenol § 2-Chlorophenol § Phenol, o-Chloro- § RCRA Waste Number U048	95-57-8 SK 2625000	Toxic			134	30 PP	30 PP	0.3	10
Chlorophenyl Phenyl Ether, 4- §§ § 4- Chlorophenyl Phenyl Ether	7005-72-3	Toxic with BCF >300			1,200				10
Chlorsulfuron §§ Glean §§ Telar	64902-72-3	Toxic				100 HA	100 HA		0.02
Chlorothalonil §§ Bravo §	1897-45-6	Carcinogen				14 HA	14 HA	N/A	0.05
Chlorpyrifos §§ Dursban § Ethion § Brodan § Eradex § Lorsban § Pyrinex § NA 2783 § Piridane § DowCo 179 § SHA 059101 § Ethion, dry § Chlorothalonil § Chlorpyrifos-Ethyl § O,O-Diethyl O-3,5,6-Trichloro-2-Pyridyl Phosphorothioate § Phosphorothioic Acid, O,O-Diethyl O-(3,5,6-Trichloro-2-Pyridyl) Ester	2921-88-2 TF 6300000	Toxic	0.083 NPP	0.041 NPP		2 HA	2 HA	0.25	0.1
Chromium, all forms §§ Cr § Chrome	7440-47-3 GB 4200000	Toxic				100 MCL	100 MCL	1	10
Chromium, hexavalent §§ Chromium (VI) §	18540-29-9	Toxic	16 PP	11 PP	16				2

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Chromium, trivalent §§ Chromium (III) §	16065-83-1	Toxic	579 @ 25mg/L hardness (12) PP	27.7 @ 25 mg/L hardness (12) PP	16			1	3
Chrysene (PAH) §§ § Benz(a)Phenanthrene § Benzo(a)Phenanthrene § 1,2-Benzphenanthrene § 1,2-Benzophenanthrene § 1,2,5,6-Dibenzonaphthalene § RCRA Waste Number U050	218-01-9 GC0700000	Carcinogen			30	1.2 PP	50 (29) HA	N/A	0.1
cis-1,2-Dichloroethylene §§ § 1,2-Dichloroethylene § cis-Dichloroethylene § cis-1,2-Dichloroethene § 1,2,cis-Dichloroethylene § ethylene, 1,2-Dichloro-, (z)-	156-59-2 KV 9420000	Toxic				70 MCL	70 MCL	0.002	0.9
cis-1,3-Dichloropropene §§ Telone II § 1,3-Dichloropropene § 1,3-Dichloropropylene § (Z)-1,3-Dichloropropene § cis-1,3-Dichloropropylene § 1-Propene, 1,3-Dichloro-, (Z)-	10061-01-5 UC 8325000	Carcinogen			1.91	3.4 HA	4 HA	N/A	0.6
Clothianidin	210880-92-5	Toxic				650 HA	650 HA		
Clopyralid §§ Stinger §	1702-17-6	Toxic				1,000 HA	1,000 HA	1	0.3

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Copper §§ Cu § Allbri Natural Copper § ANAC 110 § Arwood Copper § Bronze Powder § CDA 101 § CDA 102 § CDA 110 § CDA 122 § C.I. 77400 § C.I. Pigment Metal 2 § Copper Bronze § 1721 Gold § Gold Bronze § Kafar Copper § M1 (Copper) § M2 (Copper) § OFHC Cu § Raney Copper	7440-50-8 GL 5325000	Toxic	3.79@ 25mg/L hardness (12) PP	2.85@ 25 mg/L hardness (12) PP	36	1,300 PP	1,300 PP	0.5	2
Cyanazine §§ Bladex	21725-46-2	Toxic				10 HA	10 HA		0.02
Cyanide, total §§ § Cyanide § Isocyanide § Cyanides, includes soluble salts and complexes § RCRA Waste Number P030	57-12-5 GS 7175000	Toxic	22 PP	5.2 PP	1	4 PP	200 MCL		3
Dacthal §§ DCPA §	1861-32-1	Toxic				70 HA	70 HA	0.025	1
Dalapon §§ Revenge § Dalpon § Unipon § Dowpon § Radapon § Basinex § Ded-Weed § Dalacide § Gramevin § Crisapon § Dalpon Sodium § 2,2-Dichloropropionic Acid § SHA 28902, for sodium salt § SHA 28901, for dalapon only Propionic Acid, 2,2-Dichloro- § Sodium 2,2-Dichloropropionate § a-Dichloropropionic Acid § a,a-Dichloropropionic Acid § alpha-alpha-Dichloropropionic Acid	75-99-0 UF 0690000	Toxic				200 MCL	200 MCL	1.3	3

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dalapon, sodium salt §§ Dalpon § Unipon § Dowpon § Radapon § Revenge § Basinex § Ded-Weed § Dalacide § Gramevin § Crisapon § Dalpon Sodium § Sodium Dalapon § 2,2-Dichloropropionic Acid § SHA 28902, for sodium salt § SHA 28901, for dalapon only § Propionic Acid, 2,2-Dichloro- § Sodium 2,2-Dichloropropionate § alpha-alpha-Dichloropropionic Acid	127-20-8 UF 1225000	Toxic				200 MCL	200 MCL	1.3	3
Demeton §§ Systox § Bay 10756 § Bayer 8169 § Demox § Diethoxy Thiophosphoric Acid Ester of 2-Ethylmercaptoethanol § O,O-Diethyl 2-Ethylmercaptoethyl Thiophosphate § O,O-Diethyl O(and S)-2-(Ethyl-Thio)Ethyl Phosphorothioate Mixture § E 1059 § ENT 17,295 § Mercaptophos § Systemox § Systox § ULV § Demeton-O + Demeton-S	8065-48-3 TF 3150000	Toxic		0.1 NPP		0.3 HA	0.3 HA	0.25	0.01

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Di(2-Ethylhexyl)Phthalate (PAE) §§ Bis(2-Ethylhexyl)Phthalate § BEHP § DEHP § Octoil § Fleximel § Flexol DOP § Kodaflex DOP§ Ethylhexyl Phthalate § Diethylhexyl Phthalate § 2-Ethylhexyl Phthalate § Di(Ethylhexyl)phthalate § Di(2-Ethylhexyl)phthalate § Bis (2-Ethylhexyl) Phthalate § Bis(2-Ethylhexyl)-1,2-Benzene-Dicarboxylate § 1,2-Benzenedicarboxylic Acid, Bis(2-Ethylhexyl)Ester	117-81-7 TI 0350000	Carcinogen			130	3.2 PP	6 MCL	N/A	2
Di(2-Ethylhexyl)Adipate §§ Hexanedioic Acid § DEHA § BEHA § Bisoflex DOA § Effemoll DOA § Ergoplast AdDO § Flexol A 26 § PX-238 § Reomol DOA § Vestinol OA § Wickenol 158 § Kodaflex DOA § Monoplex DOA § NCI C54386 § Octyl Adipate § Dioctyl Adipate § Di-2-Ethylhexyl Adipate § Di (2-Ethylhexyl) Adipate § Bis(2-Ethylhexyl) Adipate § Adipic Acid, Bis(2-Ethylhexyl) Ester § Hexanedioic Acid, Bis(2-Ethylhexyl) Ester	103-23-1 AU 9700000	Carcinogen				280 HA	280 HA	N/A	6
Diazinon §§	333-41-5	Toxic	0.17 NPP	0.17 NPP		1 HA	1 HA	0.25	0.03

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Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dibenz[a,h]Anthracene (PAH) §§ § DBA § DB(a,h)A § Dibenz(a,h)Anthracene § Dibenzo(a,h)anthracene § 1,2:5,6-Benzanthracene § Dibenzo (a,h) Anthracene § 1,2,5,6-Dibenzanthracene § 1,2:5,6-Dibenz(a)Anthracene § RCRA Waste Number U063	53-70-3 HN 2625000	Carcinogen			30	0.0012 PP	0.05 (29) HA	N/A	0.1
Dibromoethane, 1,2- §§ Ethylene Dibromide § DBE § EDB § Nephis § Kopfume § Celmide § E-D-Bee § Soilfume§ Bromofume § Dowfume 40 § SHA 042002 § Pestmaster § Soilbrom-40§ Dibromoethane § Ethylene Bromide § Glycol Dibromide § 1,2-Dibromoethane § 1,2-Ethylene Dibromide § RCRA Waste Number U067	106-93-4 KH 9275000	Carcinogen				0.017 HA	0.017 HA	N/A	0.01

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dibutyl Phthalate §§ § DPB § Celluflex DPB § Elaol § Hexaplas M/B § Palatinol C§ Polycizer DBP § PX 104 § Staflex DBP § Witcizer § SHA 028001 § Butylphthalate § N-Butylphthalate § Di-n-Butylphthalate § Di-n-Butylphthalate § Dibutyl-o-Phthalate § Di-n-Butyl Phthalate § RCRA Waste Number U069 § Phthalic Acid Dibutyl Ester § Dibutyl 1,2-Benzene Dicarboxylate § 1,2-Benzenedicarboxylic Acid Dibutyl Ester § 1,2-Benzenedicarboxylic Acid, Dibutyl Ester § Benzene-o-Dicarboxylic Acid Di-n-Butyl Ester	84-74-2 TI 0875000	Toxic			89	20 PP	20 PP	0.25	10
Dicamba §§ Banvel §	1918-00-9	Toxic				200 HA	200 HA	0.28	0.7
Dichlorobenzene, 1,2- §§ DCB § ODB § ODCB § Dizene § Cloroben § Chloroben § Chloroden § Termitkil § Dilatin DB § Dowtherm E § Dilantin DB § o-Dichlorobenzene § Orthodichlorobenzene § ortho-Dichlorobenzene § Special Termite Fluid § Benzene, 1,2-Dichloro- § RCRA Waste Number U070	95-50-1 CZ 4500000	Toxic			55.6	600 MCL	600 MCL	0.02	10
Dichlorobenzene, 1,3- §§ Benzene, 1,3-Dichloro § M-Dichlorobenzene § m-Dichlorobenzene § meta-Dichlorobenzene § 1,3-Dichlorobenzene-	541-73-1 CZ 4499000	Toxic			55.6	7 PP	600 HA	0.006	5

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dichlorobenzene, 1,4- §§ Benzene, 1,4-Dichloro- § 1,4- Dichlorobenzene § PDB § PDCB § NCI C54955 § Evola § Paradi § Paradow§ Persia-Perazol § Paracide § Parazene § Paramoth § Santochlor § Paranuggets § di-Chloricide § Para Chrystals § p-Dichlorobenzene § Caswell Number 632 § Paradichlorobenzene § para-Dichlorobenzene- § p-Chlorophenyl Chloride § EPA Pesticide Chemical Code 061501 § RCRA Waste Number U070 § RCRA Waste Number U071 § RCRA Waste Number U072	106-46-7 CZ 4550000	Toxic			55.6	75 MCL	75 MCL		5
Dichlorobenzidine, 3,3'- §§ DCB § C.I. 23060 § Curithane C126 § Dichlorobenzidine § o,o'-Dichlorobenzidine § Dichlorobenzidine Base § Benzidine, 3,3'-Dichloro- § 3,3'-Dichloro-4,4'-Diaminodiphenyl § 3,3'-Dichloro-(1,1'-Biphenyl)-4,4'-Diamine § 1,1'-Biphenyl-4,4'-Diamine, 3,3'-Dichloro- § RCRA Waste Number U073	91-94-1 DD 0524000	Carcinogen			312	0.49 PP	0.49 PP	N/A	5

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dichlorodifluoromethane (HM) §§ Freon 12 § F 12 § R 12 § FC 12 § Halon § CFC-12 § Arcton 6 § Electro-CF 12 § Eskimon 12 § Frigen 12 § Gentron 12 § Isceon 122 § Kaiser Chemicals 12 § Ledon 12 § Ucon 12 § Propellant 12 § Refrigerant 12 § Fluorcarbon-12 § Difluorodichloromethane § Methane, dichlorodifluoro- § RCRA Waste Number U075	75-71-8 PA 8200000	Toxic			3.75	1,000 HA	1,000 HA	0.05	0.8
Dichloroethane, 1,2- §§ Ethylene Chloride § EDC § Brocide § 1,2-DCE § NCI C00511 § Dutch Oil § Dutch Liquid § Dichloremulsion § Di-Chlor-Mulsion § 1,2-Bichlorethane § 1,2-Dichlorethane § Ethane Dichloride § 1,2-Bichloroethane § Ethylene Dichloride § 1,2-Dichloroethane § Ethane, 1,2-Dichloro- § 1,2-Ethylene Dichloride § alpha,beta-Dichloroethane § RCRA Waste Number U077	107-06-2 KI 0525000	Carcinogen			1.2	5 MCL	4 HA	N/A	0.5
Dichloroethylene, 1,1- §§ Vinylidene Chloride § VDC § 1,1-DCE § Sconatex § NCI C54262 § 1,1-Dichloroethene § Vinylidene Chloride § 1,1-Dichloroethylene § Vinylidene Dichloride § Ethene, 1,1-Dichloro- § Vinylidene Chloride II § Dichloroethylene, 1,1- § Ethylene, 1,1-Dichloro- § RCRA Waste Number U078	75-35-4 KV 9275000	Carcinogen			5.6	7 MCL	7 MCL	N/A	0.7

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dichlorophenol, 2,4- §§ Phenol, 2,4-Dichloro § DCP § 2,4-DCP § NCI C55345 § 2,4-Dichlorophenol § RCRA Waste Number U081	120-83-2 SK 8575000	Toxic			40.7	10 PP	10 PP	10	10
Dichlorophenoxyacetic Acid, 2,4- §§ Dichlorophenoxyacetic Acid § Chlorophenoxy herbicide § 2,4-D § Salvo § Phenox § Farmco § Amidox § Miracle § Agrotect § Weedtrol § Herbidal § Ded-Weed § Lawn-Keep § Fernimine § Crop Rider § Dichlorophenoxyacetic Acid, 2,4- § Acetic Acid, (2,4-Dichlorophenoxy)- § 2,4-Dichlorophenoxyacetic Acid, salts and esters	94-75-7 AG 6825000	Toxic				70 MCL	70 MCL	0.02	1
Dichloropropane, 1,2- §§ Propylene Chloride § 1,2-Dichloropropane § NCI C55141 § Propylene Dichloride § Caswell Number 324 § Propane, 1,2-Dichloro- § a,ß-Propylene Dichloride § alpha,beta-Dichloropropane § EPA Pesticide Chemical Code 029002 § RCRA Waste Number U083	78-87-5 TX 9625000	Carcinogen			4.11	5 MCL	5 MCL		0.7

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dichloropropene, 1,3- §§ Telone II § Telone § NCI C03985 § Vidden D § Dichloropropene § a-Chloroallyl Chloride § g-Chloroallyl Chloride § 1,3-Dichloropropene § 1,3-Dichloropropylene § 1,3-Dichloro-2-Propene § Propene, 1,3-Dichloro- § Telone II Soil Fumigant § 3-Chloropropenyl Chloride § alpha,gamma-Dichloropropylene	542-75-6 UC 8310000	Carcinogen			1.91	2.7 PP	2.7 PP	N/A	0.3
Dichlorprop §§ § Canapur DP § Basagran DP § Cornox RX § Hedonil DP § Kildip § Mayclene § Polyclene § Weedone DP § Polytox	120-36-5	Toxic				300 HA	300 HA		1
Dieldrin §§ § Alvit § Quintox § Octalox § Illoxol § Dieldrex § NCI C00124 § Dieldrite § Hexachloroepoxyoctahydro-endo,exo-Dimethanonaphthalene § 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-Octahydro-2,7:3,6-Dimethanonaphth(2,3-b)Oxirene § 2,7:3,6-Dimethanonaphth(2,3-b)Oxirene, 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-Octahydro- § SHA 045001 § 1,4:5,8-Dimethanonaphthalene § RCRA Waste Number P037	60-57-1 IO 1750000	Carcinogen	0.24 PP	0.056 PP	4,670	$1.2x10^{-5}$ PP	0.02 HA	N/A	0.02

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Diethyl Phthalate §§ § Anozol § Neantine § Solvanol § NCI C60048 § Placidole E § Ethyl Phthalate § Diethylphthalate § Diethyl-o-Phthalate § 1,2-Benzenedicarboxylic Acid, Diethyl Ester § RCRA Waste Number U088	84-66-2 TI 1050000	Toxic			73	600 PP	600 PP		10
Difenoconazole §§ § 1-[2-[2-chloro-4-(4-chlorophenoxy)phenyl1]-4-methyl-1,3-dioxolan-2ymethyl]-1H-1,2,4-triazole § CGA169374 § Dividend § Dragon § Plover § Score § Score EC250	119446-68-3	Toxic				70 HA	70 HA	N/A	0.06
Dimethenamid and degredate demethenamid OA § 2-Chloro-N-(2,4-dimethyl-3-thienyl)-N-(2-methoxy-1-methylethyl)acetamide § San 682H § Frontier herbicide § EPA pesticide Code 129051	87674-68-8	Carcinogen				300 HA	300 HA	N/A	0.03
Dimethoate §§	60-51-5	Toxic				15 HA	15 HA		6
Dimethrin §§	70-38-2	Toxic				2,000 HA	2,000 HA		200

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dimethyl Phthalate §§ § DMP § NTM § ENT 262 § Mipax § Avolin § Fermine § Solvanom § Solvarone § Palatinol M § Methyl Phthalate § Dimethylphthalate § Phthalic Acid, Dimethyl Ester § Dimethyl Benzene-o-Dicarboxylate § Dimethyl 1,2-Benzenedicarboxylate § 1,2-Benzenedicarboxylic Acid, Dimethyl Ester	131-11-3 TI 1575000	Toxic			36	2,000 PP	2,000 PP	0.04	10
Dimethylphenol, 2,4- §§ Phenol, 2,4-Dimethyl- § m-Xylenol § 2,4-Xylenol § 4,6-Dimethylphenol § Caswell Number 907A § 2,4-Dimethyl Phenol § 1-Hydroxy-2,4-Dimethylbenzene § 4-Hydroxy-1,3-Dimethylbenzene § EPA Pesticide Chemical Code 086804 § RCRA Waste Number U101	105-67-9 ZE 5600000	Toxic			93.8	100 PP	100 PP	10	10
Dinitro-o-Cresol, 4,6- §§ Dinitrocresol § Detal § Sinox § DNOC § Arborol § Capsine § Dinitrol § Trifocide § Antinonin § Winterwash § Dinitro-o-Cresol § 2,4-Dinitro-o-Cresol § 4,6-Dinitro-o-Cresol § o-Cresol, 4,6-dinitro- § 2-Methyl-4,6-Dinitrophenol § 4,6-Dinitro-2-Methylphenol § 2,4-Dinitro-6-Methylphenol § 3,5-Dinitro-2-Hydroxytoluene § Phenol, 2-Methyl-4,6-Dinitro- § Caswell Number 390 § RCRA Waste Number P047	534-52-1 GO 9625000	Toxic			5.5	2 PP	2 PP		10

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dinitrophenol, 2,4- §§ Phenol, 2,4-Dinitro § Nitro § Kleenup § Aldifen § 2,4-Dinitrophenol § 2,4-DNP § Chemox PE § Maroxol-50 § Solfo Black B § alpha-Dinitrophenol § Dinitrophenol, 2,4- § Tertrosulphur Black PB § 1-Hydroxy-2,4-Dinitrobenzene § RCRA Waste Number P048	51-28-5 SL 2800000	Toxic			1.5	10 PP	10 PP	13	60
Dinitrophenols	2555-05-87	Toxic				10 NPP	10 NPP		
Dinitrotoluene, 2,4- §§ Toluene, 2,4-Dinitro § 2,4-DNT § NCI C01865 § 2,4-Dinitrotoluol - § Benzene, 1-Methyl-2,4-Dinitro- § RCRA Waste Number U105	121-14-2 XT 1575000	Carcinogen			3.8	0.49 PP	0.49 PP	N/A	0.2
Dinitrotoluene, 2,6- §§ Toluene-dinitro § 2,4-DNT § Methyl-1,3-Dinitrobenzene § RCRA Waste Number U106	606-20-2 XT 1925000	Carcinogen				0.5 HA	0.5 HA	N/A	0.2
Dinoseb §§ § DNBP § DBNF § Aretit § Basanite § Caldon § Sparic § Kiloseb § Spurge § Premerge § Dinitro § Hel-Fire § SHA 037505 § Dow General § Sinox General § Dow General Weed Killer § Vertac General Weed Killer § 2-sec-Butyl-4,6-Dinitrophenol § Dinitro-Ortho-Sec-Butyl Phenol § 2-(1-Methylpropyl)-4,6-Dinitrophenol § 4,6-Dinitro-2-(1-Methyl-n-Propyl)Phenol§ Phenol, 2-(1-Methylpropyl)-4,6-Dinitro- § RCRA Waste Number P020	88-85-7 SJ 9800000	Toxic				7 MCL	7 MCL	0.19	1

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Dioxin Chlorinated Dibenzo-p-dioxins and Chlorinated Dibenzofurans Calculation of an equivalent concentration of 2,3,7,8-TCDD is to be based on congeners of CDDs/CDFs and the toxicity equivalency factors (TEF) in van den Berg, M: et al. (2006) The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Toxicological Sciences 93(2):223-241.	1746-01-6	Carcinogen			5,000	$5x10^{-8}$ (10) PP	$2x10^{-6}$ (10) HA	N/A	footnote (10)
Diphenamid §§	957-51-7	Carcinogen				200 HA	200 HA	N/A	20
Diphenylhydrazine, 1,2- §§ Hydrazine, 1,2-Diphenyl- § Hydrazobenzene § NCI C01854 § N,N'-Bianiline § Benzene, Hydrazodi- § (sym)-Diphenylhydrazine § 1,2-Diphenylhydrazine § RCRA Waste Number U109	122-66-7 MW 2625000	Carcinogen			24.9	0.3 PP	0.3 PP	N/A	0.04
Diquat §§ § Actor § Feglox § Deiquat § Reglone § Aquacide § Dextrone § Paraquat § Preeglove § SHA 032201 § Weedtrine-D § Diquat Dibromide § Ethylene Dipyridylium Dibromide § 1,1-Ethylene 2,2-Dipyridylium Dibromide § 5,6-Dihydro-Dipyrido(1,2a,1c)Pyraziniu m Dibromide § 9,10-Dihydro-8a,10a-Diazoniaphenanthrene(1,1'-Ethylene-2,'-Bipyridylium)Dibromide	2764-72-9 JM 5690000	Toxic				20 MCL	20 MCL	0.44	2

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Disulfoton §§ § Disyston	298-04-4	Toxic				0.3 HA	0.3 HA	0.07	0.09
Diuron §§ § Karmex	330-54-1	Toxic				10 HA	10 HA	1	0.5
Endosulfan §§ § NCI C00566 § Malixv § Ensure § Beosit § Endocel § Thiodan § Cyclodan § Crisulfan § Benzoepin § Thiosulfan § SHA 079401 § Chlorthiepin § Endosulfan (mixed isomers) § Hexachlorohexahydromethano 2,4,3-Benzodioxathiepin-3-Oxide § 1,4,5,6,7,7-Hexachloro-5-Norbornene-2,3-Dimethanol Cyclic Sulfite § 5-Norbornene-2, 3-Dimethanol, 1,4,5,6,7,7-Hexachloro Cyclic Sulfite § RCRA Waste Number P050	115-29-7 RB 9275000	Toxic	0.11 (39) PP	0.056 (39) PP	270	20 PP	20 PP	0.014	see Cis and trans isomers
Endosulfan, I (the cis isomer of Endosulfan) §§ § Thiodan I § Endosulfan-I § Alpha-Endosulfan § alpha-Endosulfan	959-98-8	Toxic	0.11 (39) PP	0.056 (39) PP	270	20 PP	20 PP		0.02
Endosulfan, II (the trans isomer of endosulfan) §§ § Thiodan II § Endosulfan-II § Beta-Endosulfan § beta-Endosulfan	33213-65-9	Toxic	0.11 (39) PP	0.056 (39) PP	270	20 PP	20 PP	0.004	0.02
Endosulfan Sulfate §§ § 6,9-Methano-2,3,4-Benzodioxathiepin, 6,7	1031-07-8	Toxic			270	20 PP	20 PP	0.05	0.05

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Endothall §§ § Hydout § Hydrothal-47 § Aquathol § SHA 038901 § Accelerate § Tri-Endothal § Endothal Hydout § 3,6-Endooxohexahydrophthalic Acid § Phthalic Acid, Hexahydro-3,6-endo-Oxy- § 7-Oxabicyclo(2,2,1)Heptane-2,3-Dicarboxylic Acid § 1,2-Cyclohexanedicarboxylic Acid, 3,6-endo-Epoxy- § RCRA Waste Number P088	145-73-3 RN 7875000	Toxic				100 MCL	100 MCL	1	2
Endrin §§ § NCI C00157 § Endrex § Mendrin § Nendrin § Hexadrin § SHA 041601 § Compound 269 § 1,2,3,4,10,10-Hexachloro-6,7-Epoxy-1,4,4(a)5,6,7,8,8a-Octahydro-endo § 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-Octahydro-2, 7:3,6-Dimethanonaphth[2,3-b]oxirene § 1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-Hexachloro-6,7-Epoxy-1,4,4a,5,6,7,8,8a-Octahydro-Endo,Endo- § RCRA Waste Number P051	72-20-8 IO 1575000	Toxic with BCF >300	0.086 PP	0.036 PP	3,970	0.03 PP	2 MCL		0.006
Endrin Aldehyde §§	7421-93-4	Toxic with BCF >300			3,970	1 PP	1 PP		0.03

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Epichlorohydrin §§ § ECH § Epoxy Propane § - Epichlorohydrin § Chloromethyloxirane § RCRA Waste Number U041 § y-Chloropropyleneoxide § 2-Chloropropylene Oxide § Glycerol Epichlorhydrin § 2,3-Epoxypropyl Chloride § 1-Chlor-2,3-Epoxypropane§ 3-Chlor-1,2-Epoxypropane	106-89-8 TX 4900000	Carcinogen				10 HA	10 HA	N/A	3
Escherichia coli (Bacteria)	N/A	Harmful				(13)	Less than 1 (6)	N/A	1 per 100ml
Ethion §§ Phosphorodithioic acid, S,S'-methylene O,O,O',O'-tetraethyl ester § Diethion § Embathion § Ethanox § Ethiol 100 § Ethodan § Ethopaz § ethyl methylene phosphorodithioate § FMC-1240 § Fosfatox E § Fosfono P § HSDB 399 § Hylemox § KWIT § NIA 1240 § Niagara 1240 § Nialate § Phosphotox E § RP 8167 § Rhodocide § Rodocid § Vegfru fomisate	563-12-2	Toxic				3 HA	3 HA		0.3
Ethofumesate §§ 2-Ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methanesulfonate § BRN 5759730 § CR 14658 § Caswell #427BB § HSDB 7451 § Nortron § Progress § Tramat	26225-79-6	Toxic				2,000 HA	2,000 HA		0.08
Ethylbenzene §§ § EB § NCI C56393 § Ethylbenzol § Phenylethane § Ethyl Benzene § Benzene, Ethyl	100-41-4 DA 0700000	Toxic			37.5	68 PP	700 MCL	0.002	1

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Fenamiphos §§ § Nemacur	22224-92-6	Toxic				1.7 HA	1.7 HA		0.2
Fenbuconazole §§ 1H-1,2,4-Triazole-1-propanenitrile,alp-ha-(2-(4-chlorophenyl)ethyl)-alpha-phenyl- § 4-(4-chlorophenyl)-2-(1H-1,2,4-triazol-1-ylmethyl)butyronitrile	114369-43-6	Carcinogen				93 HA	93 HA	N/A	0.02
Fipronil §§ §HSDB 7051 §MB 46030 §RM1601 §Regent §UNII-QGH063955F	120068-37-3	Carcinogen				1 HA	1 HA	N/A	0.004
Flucarbazone §§ Flucarbazone § 1H-1,2,4-Triazole-1carboxamide, 4,5-dihydro-3-methoxy-4-methyl-5-oxo-N((2-(trifluoromethoxy)phenyl)sulfonyl)-	145026-88-6	Toxic				3,000 HA	3,000 HA		300
Flucarbazone sulfonamide §§ §	37526-59-3	Toxic				3,000 HA	3,000 HA		300
Fluometuron §§ § Flo-Met	2164-17-2	Carcinogen				83 HA	83 HA	N/A	0.5
Fluoranthene §§ § Idryl § Benzo(jk)Fluorene § Benzo(j,k)Fluorene § 1,2-Benzacenaphthene § 1,2-(1,8-Naphthylene)Benzene § Benzene, 1,2-(1,8-Naphthalenediyl)- § RCRA Waste Number U120	206-44-0 LL 4025000	Toxic BCF >300			1,150	20 PP	20 PP		10
Fluorene (PAH) §§ § 9H-Fluorene § Diphenylenemethane § o-Biphenylenemethane § 2,2'-Methylenebiphenyl	86-73-7	Toxic			30	50 PP	50 PP	0.25	5

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Fluoride §§ Flourine § Fluoride § Fluoride(1-) § Perfluoride § Fluoride Ion § Fluorine, Ion § Soluable§ Fluoride § Hydrofluoric Acid, on(1-) § RCRA Waste Number P056	16984-48-8 LM 6290000	Toxic				4,000 MCL	4,000 MCL	5	200
Fluroxypyr	69377-81-7	Toxic				7,000 HA	7,000 HA		0.1
Fonofos §§ § Dyfonate	944-22-9	Toxic				10 HA	10 HA		1
Gamma Emitters (11) §§ Photon activity with Beta particles	Multiple	Carcinogen / Radioactive				4 mrem /yr MCL	4 mrem /yr MCL	N/A	
gamma-Chlordane §§ § Chlordane, beta-Isomer	5566-34-7	Carcinogen			14,100	0.008 HA	1 HA	N/A	0.006
gamma-hexachlorocyclohexane §§ Lindane § BHC § -BHC § Gamene § Lintox § Lentox § Hexcide § Aparsin § Agrocide § Afcide § BHC-gamma § gamma-BHC § HCH-gamma § gamma-HCH § Hexachlorocyclohexane § gamma-Hexachlorobenzene § gamma-Benzenehexachloride § gamma-Benzene Hexachloride § Hexachlorocyclohexane-gamma § Hexachlorocyclohexane (gamma)	58-89-9 GV 4900000	Toxic	0.95 PP		130	0.2 MCL	0.2 MCL		0.02
Gases, dissolved, total-pressure (20) §§	Multiple	Toxic	110% of saturation						
Glufosinate ammonium	77182-82-2	Toxic				40 HA	40 HA		

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Glyphosate §§ § Jury § Honcho § Rattler § Weedoff § Roundup § Glifonox § n-(Phosphonomethyl)-Glycine § Glycine, n-(Phosphonomrthyl)- § Glyphosate plus inert ingrediants § MON 0573	1071-83-6 MC 1075000	Toxic				700 MCL	700 MCL	6	6
Glyphosate Isopropylamine Salt §§ § SHA 103601	38641-94-0	Toxic				700 HA	700 HA	6	70
Guthion §§ § DBD § NCI C00066 § Carfene § Gothnion § Azinphos § Crysthyon § Gusathion § Bay 17147 § Methylazinphos § Methyl Guthion § Methyl-Guthion § Azinphos-Methyl § Azinphos Methyl § Caswell Number 374 § o,o-Dimethylphosphorodithioate S-Ester § Benzotriazinedithiophosphoric Acid Dimethoxy Ester § Phosphorodithioic Acid, O,O-Dimethyl Ester, S-Ester with 3-(Mercaptomethyl)-1,2,3-Benzotriazin-4(3H)-One § EPA Pesticide Chemical Code 058001	86-50-0 TE 1925000	Toxic		0.01 NPP					0.1
Haloacetic acids (38) § Dichloroacetic acid (79-43-6) § Trichloroacetic acid (76-03-9) § Chloroacetic acid (79-11-8) § Bromoacetic acid(79-08-3) §Dibromoacetic acid (631-64-1)	various	Carcinogen				60 MCL	60 MCL	N/A	1

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Heptachlor §§ § NCI C00180 § Drinox § Heptamul § Agroceris § Heptagran § SHA 04481 § Rhodiachlor § Velsicol-104 § 3,4,5,6,7,8,8a-heptachlorodicyclopentadiene § Dicyclopentadiene, 3,4,5,6,7,8,8a-Heptachloro- § 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-Tetrahydro-4,7-Methanol-1H-Indene § 4,7-Methano-1H-Indene, 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-Tetrahydro- § 1(3a),4,5,6,7,8,8-Heptachloro-3a(1),4,7,7a-Tetrahydro-4,7-Methanoindene § RCRA Waste Number P059	76-44-8 PC 0700000 HAR000	Carcinogen	0.26 PP	0.0038 PP	11,200	$5.9x10^{-5}$ PP	0.08 HA	N/A	0.02
Heptachlor Epoxide §§ § HCE § Velsicol 53-CS-17 § Epoxyheptachlor § 1,4,5,6,7,8,8-Heptachloro-2,3-Epoxy-2,3,3a,4,7,7a-Hexahydro-4,7-Methanoindene § 2,5-Methano-2H-Indeno[1,2b]Oxirene, 2,3,4,5,6,7,7-Heptachloro-1a,1b,5,5a,6,6a-Hexahydro- (alpha, beta, and gamma isomers)	1024-57-3 PB 9450000	Carcinogen	0.26 PP	0.0038 PP	11,200	$3.2x10^{-4}$ PP	0.04 HA	N/A	0.01
Hexachlorobenzene §§ § HCB § Amatin § Smut-Go § Sanocide § Anticarie § Bunt-Cure § Bunt-No-More § Perchlorobenzene § Phenyl Perchloryl § No Bunt Liquid § Julin's Carbon Chloride § Co-op Hexa § Hexa C.B. § Benzene, Hexachloro-	118-74-1 DA 2975000	Carcinogen			8,690	$7.9x10^{-4}$ PP	0.2 HA	N/A	0.03

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Hexachlorobutadiene §§ § 1,3-Hexachlorobutadiene § 1,3-Butadiene, Hexachloro- § 1,1,2,3,4,4-Hexachloro-1,3-Butadiene § 1,3-Butadiene, 1,1,2,3,4,4-Hexachloro- § HCBD § Dolan-Pur § Perchlorobutadiene § RCRA Waste Number U128	87-68-3 EJ 0700000	Carcinogen			2.78	0.1 PP	5 HA	N/A	0.5
Hexachlorocyclohexane §§	608-73-1	Carcinogen				0.066 NPP	0.066 NPP	N/A	0.01
Hexachlorocyclopentadiene §§ § HEX § HCP § PCL § C-56 § HCCPD § NCI C55607 § Hexachloropentadiene § Perchlorocyclopentadiene § 1,3-Cyclopentadiene, 1,2,3,4,5,5-Hexachloro- § RCRA Waste Number U130	77-47-4 GY 1225000	Toxic			4.34	4 PP	50 MCL	1	5
Hexachloroethane §§ § Avlotane § Distokal § Distopan § Distopin § Egitol § Falkitol § Fasciolin § NCI C04604 § Phenohep § Mottenhexe § Perchloroethane § Hexachloroethylene § Ethane, Hexachloro- § Carbon Hexachloride § Ethane Hexachloride § Ethylene Hexachloride § 1,1,1,2,2,2-Hexachloroethane § RCRA Waste Number U131	67-72-1 KI 4025000	Carcinogen			86.9	1 PP	30 HA	N/A	1
Hexazinone §§	51235-04-2	Toxic				300 HA	300 HA	1	0.02

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Hydrogen Sulfide §§ § Stink Damp § Sulfur Hydride § Hydrogen Sulphide § Dihydrogen Sulfide § Dihydrogen Monosulfide § Hydrogen Sulfuric Acid § Hydrosulfuric Acid § Sulfurated Hydrogen § RCRA Waste Number U135	7783-06-4 MX 1225000	Toxic		2 NPP					20
Hydroxyatrazine §§ § Hydroxydechloroatrazine	2163-68-0	Toxic				70 HA	70 HA		7
Imazalil (Parent name Enilconazole) §§ 1-(2-(2,4-dichlorophenyl)-2-(2-propenyloxy)ethyl)-1H-imidazole § Enilconazole § BRN 054683 § Caswell #497AB § Chloramizol § Deccozil § Secozil S 75 § Fungaflor § HSDB 6672 § R 23979 § EPA Pesticide Code 111901	35554-44-0	Carcinogen				5.5 HA	5.5 HA	N/A	0.6
Imazamethabenz-methyl ester (includes the metabolite imazamethabenz methyl acid) (33) §§ Assert §	81405-85-8	Toxic				1,700 HA	1,700 HA		40
Imazamox §§ § Ammonium salt of imazamox	114311-32-9	Toxic				$2x10^4$ HA	$2x10^4$ HA		0.04
Imazapic §§ Imazapic § AC263222, Cadre, Imazameth, Imazamethapyr, Imazmethapyr	104098-48-8	Toxic				3,000 HA	3,000 HA		0.01
Imazapyr §§ Arsenal §	81334-34-1	Toxic				$1.7x10^4$ HA	$1.7x10^4$ HA		0.01

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Imazethapyr §§ 3-pyridinecarboxilic acid, 2-(4,5-dihydro-4-methyl-4-(1-methylethyl)-5oxo-1H-imidazol-2-yl)-5-ethyl- § AC 263,499 § CL263499 § HSDB 6678 § Pivot § Pursuit § EPA Pesticide Code# 128922	81335-77-5	Toxic				$1.7x10^4$ HA	$1.7x10^4$ HA		0.03
Imidacloprid §§	105827-78-9 138261-41-3	Toxic				380 HA	380 HA		0.07
Indeno(1,2,3-cd)pyrene (PAH) §§ § o-Phenylenepyrene § 2,3-Phenylenepyrene § 2,3-o-Phenylenepyrene § Indeno (l1,2,3-cd) Pyrene § 1,10-(o-Phenylene)Pyrene § 1,10-(1,2-Phenylene)Pyrene § RCRA Waste Number U137	193-39-5 NK 9300000	Carcinogen			30	0.012 PP	0.5 (29) HA	N/A	0.08
Iron §§ Fe § Ancor EN 80/150+A622 § Armco Iron	7439-89-6 NO 4565500	Harmful (aquatic life)		1,000 NPP				N/A	20
Isophorone §§ § Isoforon § NCI C55618 § Isoacetophorone § alpha-Isophorone § 1,1,3-Trimethyl-3-Cyclohexene-5-One § 3,5,5-Trimethyl-2-Cyclohexene-1-One § 3,5,5-Trimethyl-2-Cyclohexone	78-59-1 GW 7700000	Carcinogen			4.38	340 PP	400 HA	N/A	10
Lead §§ Pb § C.I. 77575 § C.I. Pigment Metal 4 § Glover § Lead Flake § Lead 22 § Omaha § Omaha & Grant § SI § SO	7439-92-1 OF 7525000	Toxic	13.98 @ 25 mg/L hardness (12) PP	0.545 @ 25 mg/L hardness (12) PP	49	15 MCL	15 MCL	0.1	0.3

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
m-Xylene §§ § m-Xylol § 1,3-Xylene § meta-Xylene § m-Dimethylbenzene § m-Methyltolulene § 1.3-Dimethylbenzene § 1,3 Dimethyl Benzene	108-38-3 ZE 2275000	Toxic			1.17	$1x10^4$ MCL	$1x10^4$ MCL	0.5	2
Malathion §§ § Formal § Sumitox § Emmatos § Celthion § Forthion § Malacide § Kop-Thion § Calmathion § Carbethoxy § NCI C00215 § Carbethoxy Malathion § SHA 057701 § Phosphothion § S-1,2-Bis(Ethoxycarbonyl)Ethyl-O,O-Dimethyl Thiophosphate § O, O-Dimethyl-S-(1,2-Dicarbethoxyethyl) Dithiophosphate § O,O-Dimethyl S-1,2-Di(Ethoxycarbamyl)Ethyl Phosphorodithioate § Succinic Acid, mercapto-, diethyl ester, S-Ester with O,O-Dimethyl Phosphorodithioate	121-75-5 WM 8400000	Toxic		0.1 NPP		470 HA	470 HA		0.09
MCPA §§ 4-chloro-2 methylphenoxy acetic acid	94-74-6	Toxic				3 HA	3 HA		0.008

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
MCPP §§ 2-(4-chloro-2-methylphenoxy)propionic acid § Mecoprop § 2M 4KhP § 2M-4CP § Anicon B § Anicon P § CMPP § Caswell #559 § Celatox CMPP § iso-Cornox § Isocarnox § Kilprop § Liranox § Mechlorprop § Mecomec § Mecopar § Mecopeop § Mecoper § Mecopex § Mecoprop § Mecoturf § Mecprop § Mepro § Methoxone § Morogal § Okultin § Proponex-pluse § RD 4593 § Rankotex § Runcatex § SYS 67 Mecmin § U 46 KV fluid § Vi-Par § Vi-Pex § EPA pesticide Code #031501	7085-19-0 93-65-2	Toxic				300 HA	300 HA		0.007
Mercury §§ Hg § Colloidal Mercury § Mercury, Metallic § NCI C60399 § Quick Silver § RCRA Waste Number U151	7439-97-6 OV 4550000	Toxic with BCF >300	1.7 PP	0.91 PP	5,500	0.05 PP	2 MCL		0.005
Metalaxyl § Ridomil §	57837-19-1	Toxic				400 HA	400 HA	3.5	0.04
Methamidophos §§ Monitor §	10265-92-6	Toxic				2 HA	2 HA		0.2
Methomyl §§ Lannate §	16752-77-5	Toxic				170 HA	170 HA	1	1

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Methoxychlor §§ § DMDT § Metox § Moxie § Methoxcide § NCI C00497 § Methoxy-DDT § Dimethoxy-DDT § 1,1,1-Trichloro-2,2-Bis(p-Methoxyphenyl)Ethane § Benzene, 1,1'-(2,2,2-Trichloroethylidene)Bis[4-Methoxy- § 1,1'-(2,2,2-Trichloroethylidene)Bis[4-Methoxybenzene] § Ethane, 1,1,1-Trichloro-2,2-Bis(p-Methoxyphenyl)- § RCRA Waste Number U247	72-43-5 KJ 3675000	Toxic		0.03 NPP		0.02 NPP	40 MCL		0.02
Metsulfuron Methyl §§ Ally §	74223-64-6	Toxic				1,700 HA	1,700 HA	0.1	0.08
Methyl Bromide §§Bromomethane (HM) § EDCO § Celfume § Dowfume § Methogas § SHA 053201 § Brom-O-Sol § Brom-O-Gas § Terr-O-Gas § Halon 1001 § Terr-O-Cide § Bromo-O-Gas § Bromo Methane § Methylbromide § Methane, Bromo- § Monobromomethane § RCRA Waste Number U029	74-83-9 PA 4900000	Toxic			3.75	100 PP	10 HA	0.11	1
Methyl Chloride §§ Chloromethane § Arctic § Monochloromethane § RCRA Waste Number U045	74-87-3 PA 6300000	Toxic			3.75	600 HA	600 HA	0.08	1
Methylene chloride §§ Dichloromethane (HM) § R 30 § DCM § Freon 30 § Aerothene MM § NCI C50102 § Solmethine § Methane Dichloride § Methane, Dichloro- § 1,1-Dichloromethane § Methylene Bichloride § Methylene Dichloride	75-09-2 PA 8050000	Carcinogen			0.9	5 MCL	5 MCL	N/A	2

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Metolachlor (includes the metabolites metolachlor ESA and metolachlor OA (34) §§ Dual §	51218-45-2	Carcinogen				1,000 HA	1,000 HA	N/A	0.2
Metribuzin §§ Sencor §	21087-64-9	Toxic				170 HA	170 HA	10	0.1
Mirex §§ § NCI C06428 § Dechlorane § Bichlorendo § Ferriamicide § Perchloropentacyclodecane § Dodecachloropentacyclodecane § Hexachlorocyclopentadiene Dimer § Cyclopentadiene, Hexachloro-, Dimer § Perchloropentacyclo(5.2.1.0[sup 2,6].0[sup 3,9].0[sup 5,8])Decane § Dodecachlorooctahydro-1,3,4-Metheno-2H-Cyclobuta (c,d)Pentalene § 1,3,4-Metheno-1H-Cyclobuta[cd]Pentalene, 1,1a,2,2,3,3a,4,5,5,5a,5b,6,-Dodecachlorooctahydro-	2385-85-5 PC 8225000	Carcinogen		0.001 NPP		1 NPP	1 NPP	N/A	0.01
MTBE §§ Methyl Tertiary-Butyl Ether	1634-04-4	Harmful				30 (21)	30 (21)	N/A	1
Myclobutanil §§ § EPA PCC 128857 § Nova § Rally § Systhane § Systhane 12E § Systhane 6 Flo	88671-89-0	Toxic				170 HA	170 HA		0.03

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
N-Nitrosodimethylamine §§ Dimethylnitrosamine A707 § DMN § NDMA § DMNA § Nitrosodimethylamine § Dimethylnitrosoamine § N-Nitrosodimethylamine § N,N-Dimethylnitrosamine § Methylamine, N-Nitrosodi- § Dimethylamine, N-Nitroso- § N-Methyl-N-Nitrosomethanamine § Methamine, N-Methyl-N-Nitroso- § Methanamine, N-Methyl-N-Nitroso- § RCRA Waste Number P082	62-75-9 IQ 0525000	Carcinogen			0.026	0.0069 PP	0.0069 PP	N/A	5
N-Nitrosodiphenylamine §§ § NDPA § NDPhA § Vultrol § Curetard A § NCI C02880 § Redax § TJP § Retarder J § Vulcalent A § Vulcatard § Vultrol § Nitrosodiphenylamine § Diphenylnitrosamine § N,N-Diphenylnitrosamine § N-Nitroso-N-Phenylaniline § Diphenylamine, N-Nitroso- § Benzenamine, N-Nitroso-N-Phenyl-	86-30-6 JJ 9800000	Carcinogen			136	33 PP	33 PP	N/A	10
n-Dioctyl Phthalate §§ § DNOP § PX-138 § Vinicizer 85 § Dinopol NOP § n-Octyl Phthalate § Octyl Phthalate § Dioctyl Phthalate § Di-n-Octyl Phthalate § Di-sec-Octyl Phthalate § 1,2-Benzenedicarboxylic Acid, Dioctyl Ester § RCRA Waste Number U107	117-84-0 TI 1925000	Carcinogen						N/A	10

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
N-Nitrosodi-N-Propylamine §§ § DPN § DPNA § NDPA § Dipropylnitrosamine § N-Nitrosodipropylamine § Di-n-Propylnitrosamine § Dipropylamine, N-Nitroso- § N-Nitrosodi-n-propylamine § N-Nitroso-di-n-propylamine § 1-Propanamine, N-Nitroso-n-Propyl- § RCRA Waste Number U111	621-64-7 JL 9700000	Carcinogen			1.13	0.05 PP	0.05 PP	N/A	5
N-Nitrosopyrrolidine §§ § NPYR § NO-pyr § N-N-pyr § 1-Nitrosopyrrolidene § Pyrrolidine, 1-Nitroso- § Tetrahydro-N-Nitrosopyrrole § Pyrrole, Tetrahydro-N-Nitroso- § RCRA Waste Number U180	930-55-2 UY 1575000	Carcinogen			0.055	0.16 NPP	0.16 NPP	N/A	0.02
Naphthalene §§ Moth Balls § Mighty 150 § NCI C52904 § Naphthene § White Tar§ Naphthalin § Tar Camphor § Caswell Number 587 § EPA Pesticide Chemical Code 055801 § RCRA Waste Number U165	91-20-3 QJ 0525000	Carcinogen			10.5	100 HA	100 HA	N/A	10
Nickel §§ Ni § C.I. 77775 § Ni 270 § Nickel 270 § Ni 0901-S § Ni 4303T § NP 2 § Raney Alloy § Raney Nickel	7440-02-0 QR 5950000	Toxic	145@ 25mg/L hardness (12) PP	16.1 @ 25 mg/L hardness (12) PP	47	100 HA	100 HA	0.5	2
Nicosulfuron §§ Accent §	111991-09-4	Toxic				8,500 HA	8,500 HA	0.01	0.03

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Nitrate (as Nitrogen[N]) §§ NO3	14797-55-8	Toxic	(8)	(8)		$1x10^4$ NPP	$1x10^4$ NPP	surface water= 10, ground water= 5,000, see ARM 17.30.715	20
Nitrate plus nitrite (as Nitrogen[N]) §§ NO3 + NO2	See nitrate and nitrite	Toxic	(8)	(8)		$1x10^4$ MCL	$1x10^4$ MCL	surface water= 10, ground water= 5,000, see ARM 17.30.715	20
Nitrite (as Nitrogen[N]) §§ NO2	14797-65-0	Toxic	(8)	(8)		1,000 MCL	1,000 MCL	4	10
Nitrobenzene §§ § NCI C60082 § Mirbane Oil § Nitrobenzol § Oil of Mirbane § Benzene, Nitro- § Essence of Myrbane § RCRA Waste Number U169	98-95-3 DA 6475000	Carcinogen			2.89	10 PP	10 PP	N/A	10
Nitrogen, total inorganic (as Nitrogen[N]) §§ the sum of ammonia, nitrite, and nitrate	See ammonia, nitrate and nitrite	Nutrient	(8)	(8)				10	10
Nitrophenol, 4- §§p-Nitropheno (DOT)l § 4-Hydroxynitrobenzene § NCI C55992) § RCRA Waste Number U170	100-02-7 SM 2275000	Toxic			3.31	50 HA	50 HA	2.4	60
o-Nitrophenol §§ § 2-Nitrophenol oxynitrobenzene	88-75-5 SM 2100000	Toxic			2.33			0.45	10

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Nitrosamines §§ -Nitrosamide § -NSC223080	35576-91-1	Carcinogen				0.008 NPP	0.008 NPP	N/A	$8x10^{-4}$
Nitrosodibutylamine, N §§ Dibutylnitrosamine § -1-Butanamine § BRN 1760378 § CCRIS 217 § EINECS 213-101-1 § HSDB 5107 § N-butyl-N-nitroso-1-butamine § NDBA § NSC 6830 § RCRA waste number U172	924-16-3	Carcinogen				0.063 NPP	0.063 NPP	N/A	3
Nitrosodiethylamine, N §§ Diethylnitrosamine § -BRN 1744991 § CCRIS 239 § DEN § EINECS 200-226-1 § Ethanamine, N-ethyl-N-nitroso § HSDB 4001 § NDEA § NSC 132 § RCRA waste number U174	55-18-5	Carcinogen				0.008 NPP	0.008 NPP	N/A	$8x10^{-4}$
Nonylphenol §§ § 2,6-Dimethyl-4-heptylphenol § Hydroxyl No. 253	25154-52-3	Toxic	28 NPP	6.6 NPP					0.7
o-Xylene §§ § o-Xylol § 1,2-Xylene § ortho-Xylene § o-Methyltoluene § o-Dimethylbenzene § 1,2-Dimethylbenzene § 1,2-Dimethyl Benzene	95-47-6 ZE 2450000	Toxic			1.17	$1x10^{4}$ MCL	$1x10^{4}$ MCL	0.5	1

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Oxamyl §§ § D-1410 § DPX 1410 § Insecticide-Nematicide 1410 § Vydate § Thioxamyl § Methyl 2-(Dimethylamino)-N- § Vydate L, Insecticide/Nematicide § ({[Methylamino]Carbonyl}Oxy)-2-Oxoethanimidothioate § 2-Dimethylamino-1-(Methylthio)Glyoxal O-Methylcarbamoylmonozime § Methyl N',N'-Dimethyl-N-({Methylcarbamoyl}Oxy)-1-Thiooxamimidate § N',N'-Dimethyl-N-[(Methylcarbamoyl)oxy]-1-Methylthiooxamimidic Acid	23135-22-0 RP 2300000	Toxic				200 MCL	200 MCL	1	1
Oxydemeton Methyl §§ Metasystox R §	301-12-2	Toxic				0.7 HA	0.7 HA	1.4	0.07
Oxygen, dissolved (20) §§ O2 § Oxygen, Compressed § Oxygen, Refrigerated Liquid	7782-44-7 RS 2060000	Toxic	(15)	(15)					0.3 mg/L

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
p,p'-Dichlorodiphenyldichloroethylene §§ DDE § DDE § p,p'-DDE § 4,4'-DDE § NCI C00555 § Dichlorodiphenyldichloroethylene § Dichlorodiphenyldichloroethylene, p,p'- § 2,2'-bis(4-Chlorophenyl)-1,1-Dichloroethylene § 1,1'-(Dichloroethenylidene)bis(4-Chlorobenzene) § 2,2'-bis(p-Chlorophenyl)-1,1-Dichloroethylene § Benzene, 1,1'-(DichloroethenylideneBis[4-Chloro-	72-55-9 KV 9450000	Carcinogen			53,600	$1.8x10^{-4}$ PP	$1.8x10^{-4}$ PP	N/A	0.02
p,p'-Dichlorodiphenyldichloroethane §§ DDD § TDE § Dilene § NCI C00475 § Rothane § Rhothane § 4,4'-DDD § p,p'-DDD § p,p'-TDE § 4',4'-D-DDD § RCRA Waste Number U060 § Tetrachlorodiphenylethane § Dichlorodiphenyldichloroethane § Dichlorodiphenyl Dichloroethane § 2,2-bis (4-Chlorophenyl)-1,1-Dichloroethane § 1,1-Dichloro-2,2-bis(p-Chlorophenyl) Ethane § 1,1-bis(4-Chlorophenyl)-2,2-Dichloroethane § 2,2-bis(p-Chlorophenyl)-1,1-Dichloroethane § Benzene, 1,1'(2,2-Dichloroethylidene)Bis[4-Chloro-	72-54-8 KI 0700000	Carcinogen			53,600	0.0012 PP	0.0012 PP	N/A	0.02

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
p,p'-Dichlorodiphenyltrichloroethane §§ DDT § DDT § 4,4'-DDT § Agritan § Anoflex § Arkotine § Azotox § Bosan Supra § Bovidermol § Chlorophenothan § Chlorophenothane § Chlorophenotoxum § Citox § Clofenotane § Dedelo § § Chlorophenothane § Diphenyltrichloroethane § Dichlorodiphenyltrichloroethane § 4,4'-Dichlorodiphenyltrichloroethane § 1,1,1-Trichloro-2,2,-bis(p-Chlorophenyl) Ethane § 1,1,1-Trichloro-2,2,-bis(p-Chlorophenyl)Ethane	50-29-3 KJ 3325000	Carcinogen	0.5 PP	0.001 PP	53,600	$3x10^{-4}$ PP	$3x10^{-4}$ PP	N/A	0.02
p-Bromodiphenyl Ether §§ Benzene, 1-Bromo-4-Phenoxy- § p-Bromodiphenyl Ether § 4-Bromophenoxybenzene § 4-Bromodiphenyl Ether § 1-Bromo-4-Phenoxybenzene § p-Bromophenylphenyl Ether § 4-Bromophenyl Phenyl Ether	101-55-3	Toxic with BCF >300			1,640				10
p-Chloro-m-Cresol §§3-methyl-4-chlorophenol § PCMC § Parol § Aptal § Baktol § Baktolan § Ottafact § Raschit § Rasen-Anicon § Parmetol § Candasetpic § Chlorocresol § Preventol CMK § Parachlorometra Cresol § 4-Chloro-3-methylphenol § 2-Chloro-Hydroxytoluene § Phenol, 4-Chloro-3-methyl- § Chlorophenol, 4-, methyl,	59-50-7 GO 7100000	Toxic				500 PP	500 PP	N/A	10

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
3- § RCRA Waste Number U039									
p-Xylene §§ § p-Xylol § Chromar § Scintillar § 1,4-Xylene § para-Xylene § p-Methyltoluene § p-Dimethylbenzene § 1,4-Dimethylbenzene § 1,4-Dimethyl Benzene	106-42-3 ZE 2625000	Toxic			1.17	$1x10^4$ MCL	$1x10^4$ MCL	0.5	2
Paraquat Dichloride §§	1910-42-5	Toxic				30 HA	30 HA	0.8	3
Parathion §§ § DNTP § Niran § Phoskil § Paradust § Stathion § Strathion § Pestox Plus § Nitrostigmine § Parathion Ethyl § Parathion-ethyl § Ethyl Parathion § Diethylparathion § Diethyl para-Nitrophenol Thiophosphate § Diethyl-p-Nitrophenyl Monothiophosphate § O,O-Diethyl O-4-Nitrophenyl Thiophosphate § Phosphorothioic Acid, O,O-Diethyl O-(4-Nitrophenyl) Ester § Caswell Number 637 § EPA Pesticide Chemical Code 057501 § RCRA Waste Number P089	56-38-2 TF 4920000,dry-liquid PAC250,dry	Carcinogen	0.065 NPP	0.013 NPP				N/A	0.2

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Pentachlorobenzene §§ Benzene, Pentachloro- § QCB- § RCRA Waste Number U183	608-93-5 DA 6640000	Toxic with BCF >300			2,125	0.1 NPP	0.1 NPP		5
Pentachlorophenol §§ Penta § PCP § Durotox § Weedone § Chem-Tol § Lauxtol A § NCI C54933 § NCI C55378 § NCI C56655 § Permite § Dowcide 7 § Permacide § Penta-Kil§ Permagard § Penchlorol § Chlorophen § Pentachlorphenol § Pentaclorofenolo § Thompson's Wood Fix § Phenol, Pentachloro- § 2,3,4,5,6-Pentachlorophenol § 1-Hydroxy- 2,3,4,5,6-Pentachlorobenzene	87-86-5 SM 6300000	Carcinogen	5.3 @ pH of 6.5 (14) PP	4 @ pH of 6.5 (14) PP	11	0.3 PP	1 MCL	N/A	0.1
Phenanthrene (PAH) §§ § Phenantrin	85-01-8 SF 7175000	Toxic			30			0.01	0.2
Phenol §§ § Baker's P and S Liquid and Ointment § NCI C50124 § Benzenol § Monophenol § Oxybenzene § Phenic Acid § Carbolic Acid § Phenylic Acid § Hydroxybenzene § Hydroxybenzene § Phenyl Alcohol § Phenyl Hydrate § Phenylic Alcohol § Phenyl Hydroxide § Benzene, Hydroxy- § Monohydroxybenzene § RCRA Waste Number U188	108-95-2 SJ 3325000	Toxic			1.4	4,000 PP	4,000 PP	100	10

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Phosphorus, inorganic (20) §§ § Ortho-phosphorus § phosphorus, Ortho- § reactive phosphorus	14265-44-2 7723-14-0	Nutrient	(8)	(8)				1	1
Picloram §§ Tordon § ATCP § K-Pin § Borolin § Amdon Grazon § NCI C00237 § Tordon 10K § Tordon 22K § Tordon 101 Mixture § 3,5,6-Trichloro-4-Aminopicolinic Acid § 4-Amino-3,5,6-Trichloropicolinic Acid	1918-02-1 TJ 7525000	Toxic				500 MCL	500 MCL	0.14	1
Pinoxaden (NOA 407855) (includes metabolites Pinoxaden NOA 407854 and pinoxaden NOA 447204) (35) §§	N/A	Toxic				2,000 HA	2,000 HA		200
Polychlorinated Biphenyls, (sum of all homolog, all isomer, all congener or all Aroclor analyses) §§ PCB's § Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1268, 2565, 4465 § Chlophen § Chlorextol § Chlorinated Biphenyl § Chlorinated Diphenyl § Chlorinated Diphenylene § Chloro Biphenyl § Chloro-1,1-Biphenyl § Clophen § Dykanol § Fenclor § Inerteen § Kanechlor 300, 400, 500 § Montar § Noflamol § PCB (DOT) § Phenochlor § Polychlorobiphenyl § Pyralene § Pyranol § Santotherm § Sovol § Therminol FR-1	Multiple	Carcinogen		0.014 PP	31,200	6.4×10^{-4} PP	0.5 MCL	N/A	0.08
Primisulfuron Methyl §§ Beacon § Exceed	86209-51-0	Toxic				1,700 HA	1,700 HA	0.1	200

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Prometon §§ Pramitol §	1610-18-0	Toxic				100 HA	100 HA	0.3	0.002
Pronamide §§ Kerb §	23950-58-5	Carcinogen				500 HA	500 HA	N/A	5
Propachlor §§ Ramrod §	1918-16-7	Toxic				87 HA	87 HA	0.5	0.2
Propane, 1,2-Dibromo-3-Chloro- §§ Dibromochloropropane § 1,2-Dibromo-3-Chloropopane § Fumagon § Fumazone § NCI C00500 § Nemabrom § Nemafume § Nemagon § Nemagone § Nemagone Soil Fumigant § Nemanax § Nemapaz § Nemaset § Nematocide § Nematox § OS 1897 § OXY DBCP § SD 1897 § Caswell Number 287 § 1-Chloro-2,3-Dibromopropane § DBCP § EPA Pesticide Chemical Code 011301 § RCRA Waste Number U066	96-12-8 TX 8750000	Toxic				0.2 MCL	0.2 MCL		0.02
Propazine §§	139-40-2	Carcinogen				100 HA	100 HA	N/A	0.03
Propham §§	122-42-9	Toxic				100 HA	100 HA	0.13	0.5
Propioconazole §§ 1-((2-(2,4-dichlorophenyl)-4propyl-1,3-dioxolan-2-yl)methyl)-1H-1,2,4-triazole § Banner § CGA-64250 § Caswell#323EE § Desmel § HSDB 6731 § Orbit § Radar § Tilt § EPA Pesticide # 122101	60207-90-1	Carcinogen				700 HA	700 HA	N/A	70
Propoxur §§ Baygon §	114-26-1	Carcinogen				24 HA	24 HA	N/A	0.4

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Prosulfuron §§ Benezenesulfonamide, N(((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl)-2-(3,3,3-trifluoropropyl)-	94125-34-5	Toxic				350 HA	350 HA		0.02
Pyrasulfotole §§ pyrasulfotole §	365400-11-9	Toxic				70 HA	70 HA		0.07
Pyrene (PAH) §§ § ß-Pyrine § beta-Pyrene § Benzo(def)Phenanthrene § Benzo[def]Phenanthrene	129-00-0 UR 2450000	Toxic			30	20 PP	20 PP	0.25	10
Pyroxsulam	422556-08-9	Toxic				7,000 HA	7,000 HA		0.09
Radium 226 §§	13982-63-6	Carcinogen / Radioactive				5 picoC/ liter Note: The sum of Radium 226 and 228. MCL	5 picoC/ liter Note: The sum of Radium 226 and 228. MCL	N/A	
Radium 228 §§	15262-20-1	Carcinogen / Radioactive				5 picoC/ liter Note: The sum of Radium 226 and 228. MCL	5 picoC/ liter Note: The sum of Radium 226 and 228. MCL	N/A	
Radon 222 §§	14859-67-7	Carcinogen / Radioactive				300 picoC/ liter HA	300 picoC/ liter HA	N/A	
Saflufenacil	372137-35-4	Toxic				310 HA	310 HA		

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Selenium §§ Se § C.I. 77805 § Colloidal Selenium § Elemental Selenium § Selenium Alloy § Selenium Base § Selenium Dust § Selenium Elemental § Selinium Homopolymer§ Selenium Metal Powder, Non-Pyrophoric § Vandex	7782-49-2 VS 7700000 and VS 8310000, colloidal	Toxic	20 PP	5 PP	4.8	50 MCL	50 MCL	0.6	1
Silver §§ Ag § Argentum § C.I. 77820 § Shell Silver § Silver Atom	7440-22-4 NIOSH: VW 3500000	Toxic	0.374 @ 25 mg/L hardness (12) PP		0.5	100 HA	100 HA	0.2	0.2
Simazine §§ § CDT § Herbex § Framed § Bitemol § Radokor § A 2079 § Batazina § Cat (Herbicide) § CET § G 27692 § Geigy 27,692 § Gesaran § Gesatop 50 § Simazine 80W § Symazine § Taphazine § W 6658 § Zeapur § Princep § Aquazine § Herbazin § Tafazine § 2,4-bis(Ethylamino)-6-Chloro-s-Triazine § 1-Chloro, 3,5-Bisethylamino-2,4,6-Triazine § 2-Chloro-4,6-Bis(Ethylamino)-1,3,5-Triazine § 6-Chloro-N,N'-Diethyl-1,3,5-Triazine-2,4-Diyldiamine	122-34-9 XY 5250000	Carcinogen				4 MCL	4 MCL	N/A	0.5
Strontium §§	7447-24-6	Toxic				4,000 HA	4,000 HA	100	20

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			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Styrene §§ § Styrol § Cinnamol § Cinnamene § Cinnamenol § NCI C02200 § Styrole § Strolene § Styron § Stropor § Vinylbenzol § Phenethylene § Phenylethene § Vinylbenzene § Ethenylbenzene § Phenylethylene § Benzene, Vinyl- § Stryene, Monomer	100-42-5 WL 3675000	Carcinogen				100 MCL	100 MCL	N/A	0.9
Sulfentrazone	122836-35-5	Toxic				700 HA	700 HA		
Sulfometuron Methyl §§ Oust §	74222-97-2	Toxic				1,800 HA	1,800 HA	0.01	0.02
Sulfosulfuron §§ imidazo(1,2-a)pyridine-3-sulfonamide,N-(((4,6-dimethoxy-2-pyrimidinyl)amino)cabonyl)-2-(ethylsulfonyl)- § Sulfosulfuron (ISO)	141776-32-1	Toxic				1,600 HA	1,600 HA		30
Tebuconazole §§ 1H-1,2,4-Triazole-1-ethanol,alpha-(2-(4-chlorophenyl)ethyl)-apha-(1,1-dimethylethyl)- § BAY-HWG 1608 § Elite § Ethyltrianol § Etiltrianol § Fenetrazole § Folicur § LYNX § Preventol A 8 § Raxil § Terbucanazole § Terbutrazole § HWG 1608 § HSDB 7448	107534-96-3	Carcinogen				190 HA	190 HA	N/A	0.04
Tebuthiuron §§ TebuconazoleSpike	34014-18-1	Toxic				500 HA	500 HA	2	0.002
Terbacil §§ Sinbar §	5902-51-1	Toxic				83 HA	83 HA	2.2	0.02

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Terbufos §§ Counter §	13071-79-9	Toxic				0.83 HA	0.83 HA	0.5	0.07
Tetrachlorobenzene, 1,2,4,5- §§ Benzene, 1,2,4,5-Tetrachloro- § RCRA Waste Number U207 § 1,2,4,5-Tetrachlorobenzene	95-94-3 DB 9450000	Toxic with BCF >300			1,125	0.03 NPP	0.03 NPP		5
Tetrachloroethane, 1,1,2,2- §§ Tetrachloroethane § TCE § Cellon § Westron § Bonoform § sym-Tetrachloroethane § Acetylene Tetrachloride § 1,1,2,2-Tetrachloroethane § Ethane, 1,1,2,2-Tetrachloro- § 1,1-Dichloro-2,2-Dichloroethane § RCRA Waste Number U209	79-34-5 NIOSH: KI 8575000	Carcinogen			5	2 PP	2.0 HA	N/A	0.5
Tetrachloroethylene §§ Perchlorethylene § NCI C04580 § PCE § Perk § PERC § ENMA § Dow-Per § Perchlor § Perclene § Perklone § Didakene § Tetra Cap § Percosolve § Perchloroethylene § Tetrachloroethene § Carbon Bichloride § Carbon Dichloride § Ethylene Tetrachloride § Ethylene, Tetrachloro- § 1,1,2,2-Tetrachloroethylene § RCRA Waste Number U210	127-18-4 KX 3850000	Carcinogen			30.6	5 MCL	5 MCL	N/A	0.7
Thallium §§ Tl § Ramor	7440-28-0 XG 3425000	Toxic			119	0.24 PP	2 MCL	0.3	0.2
Thiamethoxam	153719-23-4	Toxic				80 HA	80 HA		
Thifensulfuron Methyl §§ Harmony § Pinnacle	79277-27-3	Toxic				290 HA	290 HA	1	90

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Toluene §§ § Antisal 1a § NCI C07272 § Toluol § Tolu-Sol § Methacide § Methylbenzol § Methylbenzene § Phenylmethane § Phenyl-Methane § Methyl-Benzene § Benzene, Methyl § RCRA Waste Number U220	108-88-3 XS 5250000	Toxic			10.7	57 PP	1,000 MCL	0.01	1
Toxaphene §§ § Attac 4-2 § Alltox § Alltex § Attac 6 § Toxakil § Agricide § Chem-Phene § Clor Chem T-590 § Compound 3956 § Crestoxo § Estonox § Geniphene § Gy-Phene § Hercules 3956 § Melipax § Motox § PCC § Phenacide § Toxaphene mixture § Chlorinated-Camphene § Camphene, Octachloro- § RCRA Waste Number P123	8001-35-2 XW 5250000	Carcinogen	0.73 PP	0.0002 PP	13,100	0.007 PP	0.3 HA	N/A	1
Tralkoxydim (28) §§ Achieve	87820-88-0	Carcinogen	3,750			30 HA	30 HA	N/A	2
trans-1,2-Dichloroethylene §§ § trans-Dichloroethylene § RCRA Waste Number U079 § trans-1,2-Dichloroethane § trans-1,2-Dichloroethene § Dichloroethylene, trans-§ trans-Acetylene Dichloride § 1,2-trans-Dichloroethylene § Ethene, 1,2-Dichloro-, €- § 1,2-Dichloroethylene, trans-	156-60-5 KV 9400000	Toxic			1.58	100 PP	100 MCL	0.05	0.6

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
trans-1,3-Dichloropropene §§ § 1,3-Dichloropropene § 1,3-Dichloropropylene § (E)-1,3-Dichloropropene § trans-1,3-Dichloropropylene § 1-Propene, 1,3-Dichloro-, (E)-	10061-02-6 UC 8320000	Carcinogen			1.91	2 HA	2 HA	N/A	0.3
trans-Nonachlor (Chlordane component) §§ § Chlordane, trans-Isomer	39765-80-5	Carcinogen			14,100	0.008 PP	1 HA	N/A	0.1
Triallate §§ § Avadex BW § BRN 1875853 § Dipthal § Far-Go § Triamyl	2303-17-5	Carcinogen				4.6 HA	4.6 HA	N/A	5
Triasulfuron §§ Amber	82097-50-5	Toxic				70 HA	70 HA	1	0.03
Tribenuron Methyl §§ Express	101200-48-0	Carcinogen				50 HA	50 HA	N/A	6
Tributyltin (TBT) §§ §Tin-San § Tributylin chloride complex § EPA Pesticide Chemical #083108	56573-85-4	Toxic	0.46 NPP	0.072 NPP					0.007
Trichlorobenzene, 1,2,4- §§ Benzene, 1,2,4-Trichloro- § unsym-Trichlorobenzene § 1,2,4-Trichlorobenzene	120-82-1 DC 2100000	Toxic			114	0.071 PP	70 MCL	0.02	10
Trichloroethane, 1,1,2- §§ Vinyl Trichloride § 1,1,2-Trichloroethane § ß-T § Ethane Trichloride § beta-Trichloroethane § NCI C04579 § Ethane, 1,1,2-Trichloro- § Caswell Number 875A [NLM] § EPA Pesticide Chemical Code 081203 [NLM]§ 1,2,2-Trichloroethane § RCRA Waste Number U227	79-00-5 KJ 3150000	Carcinogen			4.5	5 MCL	3 HA	N/A	0.7

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Trichloroethane, 1,1,1- §§ Methyl Chloroform § -T § Strobane § Inhibisol § 1,1,1-TCE § Tri-Ethane § Solvent 111 § Aerothene TT § Chloroethene § Chlorten § NCI C04626 § Methylchloroform § Chloroform, Methyl- § 1,1,1-Trichloroethene § alpha-Trichloroethane § Methyltrichloromethane § 1,1,1-Trichloroethane § Ethane, 1,1,1-Trichloro-§ RCRA WAste Number U226	71-55-6 KJ 2975000	Toxic			5.6	200 MCL	200 MCL	0.5	0.7
Trichloroethylene §§ § TCE § Triad § Vitran § Algylen § Dow-Tri § Lanadin § Vestrol § Anamenth § Benzinol § Tri-Plus § Tri-Clene § Trichlorethene § Trichloroethene § Trichloroethane § Trichlorethylene § Ethene, Trichloro- § Ethylene Trichloride § Ethylene, Trichloro- § Acetylene Trichloride § 1,1,2-Trichloroethylene § 1,2,2-Trichloroethylene § 1-Chloro-2,2-Dichloroethylene § 1, 1-Dichloro-2-Chloroethylene	79-01-6 KX 4550000	Carcinogen			10.6	5 MCL	5 MCL	N/A	0.5

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Trichlorofluoromethane (HM) §§ Freon 11 § F 11 § FC 11 § Arcton 9 § Eskimon 11 § Halocarbon 11 § Algofrene Type 1 § Fluorocarbon Number 11 § NCI C04637 § Isotron 11 § Fluorotrichloromethane § Isceon 131 § Monofluorotrichloromethane § Ucon Refrigerant 11 § Trichloromonofluoromethane § RCRA Waste Number U121	75-69-4 PB 6125000	Toxic			3.75	2,000 HA	2,000 HA	0.07	0.8
Trichlorophenol, 2,4,5- §§ Dowcide B § 2,4,5-Trichlorophenol § Nurelle § Dowcide 2 § Collunosol § Preventol 1 § NCI C61187 § RCRA Waste Number U230	95-95-4 SN 1400000	Toxic			110	300 NPP	300 NPP	10	60
Trichlorophenol, 2,4,6- §§ Phenachlor § Omal § Phenol, 2,4,6-trichloro- § NCI C02904 § 2,4,6-Trichlorophenol § Dowcide 2S § RCRA Waste Number U231	88-06-2 SN 1575000	Carcinogen			150	15 PP	30 HA	N/A	10

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Trichlorophenoxy Proprionic Acid, 2 (2,4,5-) §§ Fenoprop § 2 (2,4,5-Trichlorophenoxy) Proprionic Acid § Kuran § Propon § Silvex § Aqua-Vex § Ded-Weed § Sta-Fast § 2,4,5-TP § Color-Set § Weed-B-Gon § Double Strength § 2,4,5-Trichlorophenoxypropionic Acid § (2,4,5-Trichlorophenoxy)Propionic Acid § 2-(2,4,5-Trichlorophenoxy)-Proprionic Acid § (+/-)-2-(2,4,5-Trichlorophenoxy)propanoic Acid § RCRA Waste Number U233	93-72-1 UF 8225000	Toxic				50 MCL	50 MCL	0.075	0.2
Trichlorophenoxyacetic Acid §§ Brush-Rhap § 2,4,5-T (Brush-Rhap)	93-76-5	Toxic				70 HA	70 HA		0.2
Triclopyr §§ 3,4,5-Trichloro-2pyridinyloxyacetic acid § Confront § Dowco 233 § Garlon § Garlon 2 § Garlon 250 § Grazon 250 § Redeem § Release § Turflon § Caswell# 8821 § HSDB 7060 § EPA Pesticide Chemical #116001	55335-06-3	Toxic				300 HA	300 HA		0.5
Trifluralin §§ Treflan § Buckle	1582-09-8	Carcinogen				43 HA	43 HA	N/A	0.5
Trihalomethanes, total §§ § TTHMs	Multiple	Carcinogen				80 MCL	80 MCL	N/A	3
Triticonazole §§	131983-72-7	Toxic				1,100 HA	1,100 HA		0.1

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Uranium, natural §§ U § Uranium Metal, Pyrophoric	7440-61-1 YR 3490000	Carcinogen / Radioactive				30 MCL	30 MCL	N/A	0.2
Vinyl 2-Chloroethyl Ether §§ Vinyl ß-Chloroethyl Ether- § 2-Chloroethyl Vinyl Ether § (2-Chloroethoxy)Ethene § RCRA Waste Number U042	110-75-8 KN 6300000	Carcinogen			0.557			N/A	2
Vinyl Chloride §§ § VC § VCM § Chlorethene § Chloroethene § Chlorethylene § Chloroethylene § Ethylene, Chloro- § Monochloroethylene § Ethylene Monochloride § Vinyl Chloride Monomer § Vinyl C Monomer § Trovidur § RCRA Waste Number U043	75-01-4 KU 9625000	Carcinogen			1.17	0.22 PP	0.2 HA	N/A	0.4
Xylenes, total §§ § Xylol § Violet 3 § Mixed Xylenes § Methyl Toluene § Dimethylbenzene § NCI C55232 § Total equals the sum of meta, ortho, and para. § RCRA Waste Number U239	1330-20-7 ZE 2100000	Toxic			1.17	$1x10^4$ MCL	$1x10^4$ MCL	0.5	3

Pollutant Element / Chemical Compound or Condition §§ - Primary Synonym § - Other Names	CASRN numbers, NIOSH number (25) (26)	Category (1) (2)	Aquatic Life Standards (µg/L except where indicated)		Bio-concentration Factor (BCF) (µg/L) (5)	Human Health Standards (µg/L except where indicated) (17) (16)		Trigger Value (µg/L) (22)	Required Reporting Value (µg/L except where indicated) (19)
			Acute (3)	Chronic (4)		Surface Water	Ground Water		
Zinc §§ Zn § Blue Powder § C.I. 77945 § C.I. Pigment Black 16 § C.I. Pigment Metal 6 § Emanay Zinc Dust § Granular Zinc § Jasad § Merrillite § Pasco § Zinc, Powder or Dust, non-Pyrophoric § Zinc, Powder or Dust, Pyrophoric	7440-66-6 ZG 8600000	Toxic	37 @ 25 mg/L hardness (12) PP	37 @ 25 mg/L hardness (12) PP	47	7,400 PP	2,000 HA	5	8

FOOTNOTES

(1) Categories include toxic, carcinogen, and harmful. Parameters categorized as toxic and carcinogenic are based on EPA's Integrated Risk Information System (IRIS). Parameters categorized by the Department as harmful include biological agents (such as E. coli), parameters that cause taste and/or odor effects (such as MTBE), and parameters that generate physical effects (such as iron).

(2) Chemicals classified by EPA as carcinogens for an oral route of exposure in the drinking water regulations and health advisories (EPA 822-B-96-002 and EPA 820-R-11-002) and those listed as carcinogens in the EPA priority pollutants list. In 2005, the EPA added a new scale to describe carcinogens and both the 1986 and 2005 scales are now in simultaneous use. The classifications considered carcinogenic in the 1986 scale are as follows: A (human carcinogen); B1 or B2 (probable human carcinogens); and C (possible human carcinogen). In the 2005 scale, the following categories are considered carcinogens: H (human carcinogen); L (likely carcinogen); L/N (likely to be carcinogenic above a specified dose) and S (suggestive evidence of carcinogenic potential).

(3) The one-hour average concentration of these parameters in surface waters may not exceed these values more than once in any three year period, on average, with the exception of silver, which, at present, is interpreted as a "not to exceed" value.

(4) The 96 hour average concentration of these parameters in surface waters may not exceed these values more than once in any three year period, on average.

(5) All bioconcentration factors (BCFs) were developed by the EPA as part of the Standards development as mandated by Section 304(a) of the federal Clean Water Act. National Recommended Water Quality Criteria: 2002 Human Health Criteria Calculation Matrix (EPA-822-R-02-012).

(6) The 24 hour geometric mean value must not exceed these values.

(7) Freshwater Aquatic Life Standards for total ammonia nitrogen (mg/L NH_3-N plus NH_4-N).

Because these formulas are non-linear in pH and temperature, the Standard is the average of separate evaluations of the formulas reflective of the fluctuations of pH and temperature within the averaging period; it is not appropriate to apply the formula to average pH and temperature.

1. The one-hour average concentration of total ammonia nitrogen (in mg/L) does not exceed the CMC (acute criterion) calculated using the following equations.

Where salmonid fish are present:

$$\text{CMC} = \frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}}$$

Or where salmonid fish are not present:

$$\text{CMC} = \frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$$

ED_014374_00000318-00253

2. The thirty-day average concentration of total ammonia nitrogen (in mg/L) does not exceed the CCC (chronic criterion) calculated using the following equations.

When fish early life stages[1] are present:

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times MIN\left(2.85, 1.45 \times 10^{0.028 \times (25 - T)}\right)$$

When fish early life stages[1] are absent:

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times 1.45 \times 10^{0.028 \times (25 - MAX(T,7))}$$

[1] Includes all embryonic and larval stages and all juvenile forms of fish to 30-days following hatching.

3. In addition, the highest four-day average within the 30-day period should not exceed 2.5 times the CCC.

Table 1. pH-Dependent Values of the CMC (Acute Criterion) for Ammonia.

CMC, total ammonia nitrogen (µg/L NH_3-N plus NH_4-N)		
pH	**Salmonids Present**	**Salmonids Absent**
6.5	32600	48800
6.6	31300	46800
6.7	29800	44600
6.8	28100	42000
6.9	26200	39100
7.0	24100	36100
7.1	22000	32800
7.2	19700	29500
7.3	17500	26200
7.4	15400	23000
7.5	13300	19900
7.6	11400	17000
7.7	9650	14400
7.8	8110	12100
7.9	6770	10100
8.0	5620	8400
8.1	4640	6950
8.2	3830	5720
8.3	3150	4710
8.4	2590	3880
8.5	2140	3200
8.6	1770	2650
8.7	1470	2200
8.8	1230	1840
8.9	1040	1560
9.0	885	1320

ED_014374_00000318-00254

Table 2. Temperature and pH-Dependent Values of the CCC (Chronic Criterion) for *Fish Early Life Stages Present* and for *Fish Early Life Stages Absent*.

CCC for Fish Early Life Stages Present, total ammonia nitrogen (µg/L NH_3-N plus NH_4-N)										
pH	**Temperature, °C**									
	0	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**
6.5	6670	6670	6060	5333	4680	4120	3620	3180	2800	2460
6.6	6570	6570	5970	5250	4610	4050	3560	3130	2750	2420
6.7	6440	6440	5860	5150	4520	3980	3500	3070	2700	2370
6.8	6290	6290	5720	5030	4420	3890	3420	3000	2640	2320
6.9	6120	6120	5560	4890	4300	3780	3320	2920	2570	2250
7.0	5910	5910	5370	4720	4150	3650	3210	2820	2480	2180
7.1	5670	5670	5150	4530	3980	3500	3080	2700	2380	2090
7.2	5390	5390	4900	4310	3780	3330	2920	2570	2260	1990
7.3	5080	5080	4610	4060	3570	3130	2760	2420	2130	1870
7.4	4730	4730	4300	3780	3320	2920	2570	2260	1980	1740
7.5	4360	4360	3970	3490	3060	2690	2370	2080	1830	1610
7.6	3980	3980	3610	3180	2790	2450	2160	1900	1670	1470
7.7	3580	3580	3250	2860	2510	2210	1940	1710	1500	1320
7.8	3180	3180	2890	2540	2230	1960	1730	1530	1330	1170
7.9	2800	2800	2540	2240	1960	1730	1520	1330	1170	1030
8.0	2430	2430	2210	1940	1710	1500	1320	1160	1020	897
8.1	2101	2101	1910	1680	1470	1290	1140	1000	879	773
8.2	1790	1790	1630	1430	1260	1110	973	855	752	661
8.3	1520	1520	1390	1220	1070	941	827	727	639	562
8.4	1290	1290	1170	1030	906	796	700	615	541	475
8.5	1090	1090	990	870	765	672	591	520	457	401
8.6	920	920	836	735	646	568	499	439	386	339
8.7	788	788	707	622	547	480	422	371	326	287
8.8	661	661	601	528	464	408	359	315	277	244
8.9	565	565	513	451	397	349	306	269	237	208
9.0	486	486	442	389	342	300	264	232	204	179

*At 15 C and above, the criterion for fish *ELS absent* is the same as the criterion for fish *ELS present*

(8) A plant nutrient, excessive amounts of which may cause violations of Administrative Rules of Montana (ARM) 17.30.637 (1)(e).

(9) Approved methods of sample preservation, collection, and analysis for determining compliance with the standards set forth in DEQ-7 are found in the surface water quality standards (ARM17.30.601, et seq.) and the ground water rules (ARM 17.30.1001, et seq.).

Standards for metals (except aluminum) in surface water are based upon the analysis of samples following a "total recoverable" digestion procedure (EPA Method 200.2, Supplement I, Rev. 2.8, May, 1994).

Standards for alpha emitters, beta emitters and gamma emitters in surface waters are based upon the analysis of unfiltered samples and appropriate EPA approved analysis methods.

ED_014374_00000318-00255

Standards for metals in ground water are based upon the dissolved portion of the sample (after filtration through a 0.45 µm membrane filter, as specified in "Methods for Analysis of Water and Wastes" 1983, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, EPA-600/4-79-020, or equivalent). Standards for alpha emitters, beta emitters and gamma emitters in ground water are based upon the analysis of unfiltered samples and appropriate EPA approved analysis methods.

Standard for organic parameters in surface water and ground water are based on unfiltered samples.

(10) Calculation of an equivalent concentration of 2,3,7,8-TCDD is to be based on congeners of CDDs/CDFs and the toxicity equivalency factors (TEF) in van den Berg, M: et al. (2006) The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Toxicological Sciences 93(2):223-241. The analysis method to be used is EPA Method 1613, Revision B, Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS), EPA Method 8290, or other method approved by the department on case by case basis. The Required Reporting Value(s) (RRV) for Dioxin and congeners are to be the lowest detection level for the analysis method approved by the Department.

(11) Radionuclides consisting of alpha emitters, beta emitters and gamma emitters are classified as carcinogens. “Alpha emitters” means the total radioactivity due to alpha particle emission. “Beta emitters” means the total radioactivity due to beta particle emission. “Gamma emitters” means the total radioactivity due to gamma particle emission. The emitters covered under this Standard include but are not limited to: Cesium, radioactive Iodine, radioactive Strontium-89 and -90, radioactive Tritium Gamma photon emitters.

(12) Freshwater aquatic life standards for these metals are expressed as a function of total hardness (mg/L, $CaCO_3$). The values displayed in the chart correspond to a total hardness of 25 mg/L. The hardness relationships are:

	Acute = exp.{ma[ln(hardness)]+ba}			**Chronic = exp.{mc[ln(hardness)]+bc}**	
	ma	**ba**		**mc**	**Bc**
Cadmium	0.9789	-3.866		0.7977	-3.909
Copper	0.9422	-1.700		0.8545	-1.702
Chromium (III)	0.819	3.7256		0.819	0.6848
Lead	1.273	-1.46		1.273	-4.705
Nickel	0.846	2.255		0.846	0.0584
Silver	1.72	-6.52			
Zinc	0.8473	0.884		0.8473	0.884

Note: If the hardness is <25mg/L as $CaCO_3$, the number 25 must be used in the calculation. If the hardness is greater than or equal to 400 mg/L as $CaCO_3$, 400 mg/L must be used in the calculation.

(13) The surface water E. coli human health standards were adopted to protect recreational uses of surface waters in Montana and vary based on the water-use classification. See Administrative Rules of Montana (ARM), title 17, Chapter 30 - Water Quality, Sub-Chapter 6 - Surface Water Quality Standards.

ED_014374_00000318-00256

(14) Freshwater aquatic life standard for pentachlorophenol is dependent on pH. Values displayed in the chart correspond to a pH of 6.5 and are calculated as follows:

Acute = exp[1.005(pH) - 4.869] Chronic = exp[1.005(pH) - 5.134]

(15) Freshwater aquatic life standards for dissolved oxygen in milligrams per liter are as follows:

	Standards for Waters Classified A-1, B-1, B-2, C-1, and C-2		**Standards for Waters Classified B-3, C-3, and I**	
	Early Life Stages[1,2]	**Other Life Stages**	**Early Life Stages[2]**	**Other Life Stages**
30 Day Mean	N/A[3]	6.5	N/A[3]	5.5
7 Day Mean	9.5 (6.5)	N/A[3]	6.0	N/A[3]
7 Day Mean Minimum	N/A[3]	5.0	N/A[3]	4.0
1 Day Minimum[4]	8.0 (5.0)	4.0	5.0	3.0

[1] These are water column concentrations recommended to achieve the required inter-gravel dissolved oxygen concentrations shown in parentheses. For species that have early life stages exposed directly to the water column, the figures in parentheses apply.
[2] Includes all embryonic and larval stages and all juvenile forms of fish to 30 days following hatching.
[3] N/A (Not Applicable).
[4] All minima should be considered as instantaneous concentrations to be achieved at all times.

(16) Surface or groundwater concentrations may not exceed these values.

(17) Source of the criteria used to derive the standard:
PP = priority pollutant criteria
NPP = non-priority pollutant criteria
OL= organoleptic pollutant criteria
MCL = Maximum contaminant level from the drinking water regulations
HA = health advisory developed from EPA's "Drinking Water Standards and Health Advisories" (October 1996) guidance, using recent scientific evidence and verified by EPA Region VIII toxicologist

(18) Reserved

(19) The required reporting value (RRV) is the Department's selection of a laboratory reporting limit that can be met by the majority of local laboratories. In most cases, the RRV is sufficiently sensitive to meet the most stringent numeric water quality standard. The RRV shall be used when reporting surface water or ground water monitoring or compliance data to the Department unless otherwise specified by the Department in a permit, approval or authorization issued by the Department.

Montana Pollutant Discharge Elimination System (MPDES) applicants and permittees must use EPA-approved analytical methods that are capable of detecting and measuring the pollutants at, or below, the applicable water quality standards or permit limits ("sufficiently sensitive methods"). If an RRV included in this document is not lower than the applicable water quality standard or permit limit but an EPA-approved analytical method is capable of detecting and measuring the pollutant

at, or below, the applicable water quality standard, then the minimum level for the sufficiently sensitive method supersedes the RRV.

It is the responsibility of the sampling entity to ensure that appropriate methods and reporting limits are requested from the laboratory to meet analytical and reporting limit needs.

(20) Applicable to surface waters only.

(21) Based on taste and odor thresholds given in EPA 822-f-97-008 December 1997.

(22) Trigger Values are used to determine if a given increase in the concentration of toxic parameters is significant or non-significant as per the nondegradation rules ARM 17.30.701 et seq. The acronym "N/A" means "not applicable".

(23) Reserved

(24) Reserved

(25) CASRN is an acronym for the American Chemical Society's Chemical Abstracts Service Registry Number.

(26) The NIOSH RTECS number is a unique number used for identification in the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances.

(27) Reserved

(28) The sum of the concentrations of tralkoxydim and its breakdown products shall not exceed the standards listed. For a list of known breakdown products, see EPA memorandum "EFED's Section 3 Review for Tralkoxydim (Chemical #121000; Case # 060780; DP Barcodes 0234682, 0234752, 0238697, 0235723 & 0239519)," and the associated "Environmental Fate Assessment for Tralkoxydim."

(29) Ground water human health standard is based on the relative potency for selected PAH compounds listed in Table 8 of the EPA “Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons” July 1993, EPA/600/R-93/089.

(30) The sum of the concentrations of acetochlor and the breakdown products, acetochlor ESA and acetochlor OA, shall not exceed the standards listed.

(31) The sum of the concentrations of alachlor and the breakdown products, alachlor ESA and alachlor OA, shall not exceed the standards listed.

(32) The sum of the concentrations of atrazine and the breakdown products, deethyl atrazine, deisopropyl atrazine, and deethyl deisopropyl atrazine, shall not exceed the standards listed.

(33) The sum of the concentrations of imazamethabenz-methyl ester and the breakdown product, imazamethabenz-methyl acid, shall not exceed the standards listed.

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(34) The sum of the concentrations of metolachlor and the breakdown products, metolachlor ESA and metolachlor OA, shall not exceed the standards listed.

(35) The sum of the concentrations of pinoxaden (NOA 407855) and the breakdown products, pinoxaden NOA 407854 and pinoxaden NOA 447204, shall not exceed the standards listed.

(36) The human health criterion for arsenic is the more restrictive of the risk based level of 1 in 1,000 [$1x10^{-3}$] or the MCL.

(37) The quantitative combination of two or more of aldicarb, aldicarb sulfone and aldicarb sulfoxide shall not exceed 7 µg/L because each has a similar mode of action.

(38) The quantitative sum of all listed haloacetic acids is used in determining the total haloacetic acid concentration.

(39) The sum of the concentrations of endosulfan and its isomers endosulfan I and endosulfan II shall not exceed the standards listed.

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Section 7

USEPA Region 8 Local Limits Spreadsheet

The **final** Local Limits Spreadsheet pages are included following this section.

The Local Limits Spreadsheet pages from the January 2019 submittal are included and marked with "2019 Submittal Not Final".

The City notes that EPA "continues to recommend the City develop daily-only local limits for ease of implementation in SIU permits" as stated in a September 8, 2020 email from EPA. After evaluating the two procedures, the City prefers to proceed with implementing both average monthly (chronic) and maximum daily (acute) local limits.

Enter Data in Blue Areas Only Values entered in Blue area are for examples only. Update these.

A	B	C
TABLE 1 - GENERAL DATA ENTRY		
POTW NAME:	ity of Helena Wastewater Treatment Plant	
POTW HIGHEST MONTHLY AVERAGE FLOW **(MGD)**:	4.39	
DOMESTIC FLOW **(MGD)**:	2.67026	
SIU FLOW **(MGD)**:	0.0255	
COMMERCIAL FLOW **(MGD)**:	1.69015	
TRUCKED AND HAULED WASTE FLOW **(MGD)**:	0.00409	
COMMERCIAL FLOW AS A % OF ALL NON-DOMESTIC	99	
TOTAL **COMMERCIAL** FLOW AS A % OF TOTAL POTW FLOW	39	
TOTAL NON-DOMESTIC FLOW AS A % OF TOTAL POTW FLOW	39	
SPECIFIC GRAVITY OF SLUDGE TO DISPOSAL (kg/l)	1.01	
SLUDGE FLOW TO DISPOSAL **(MGD)**:	0.0186	
% SOLIDS TO DISPOSAL **(%)**	1.9	
BIOSOLIDS TABLE (**1,3 OR "O"THER**) BASED ON DISPOSAL OPTION:	3	
ARE YOU USING TABLE 2 FOR BIOSOLIDS **(Y/N)**?:	N	
SITE AREA **(ACRES)**:	Not Using Table 2	
SITE LIFE **(YEARS)**:	Not Using Table 2	
CHRONIC RECEIVING WATER FLOW **(MGD)**:	0	
ACUTE RECEIVING WATER FLOW **(MGD)**:	0	
HARDNESS FOR METALS CALCULATIONS **(MG/L)**:	134	
IS YOUR RECEIVING WATER A DRINKING WATER SUPPLY **(Y/N)**?:	Y	
APPLICABLE STANDARDS (ACUTE, CHRONIC, BOTH):	B	**A,C OR B**

Spreadsheet

Please email Curt A McCormick at mccormick.curt@epa.gov with any comments if you are in Region 8 Not supported outside of Region 8 Pretreatment Programs

See Appendix M of the Strategy

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B	C	D	E	F	G	H	I
Daily TABLE 2: CRITERIA AND STANDARDS POLLUTANT	Daily Max/7 Day NPDES PERMIT LIMITS MG/L	STATE ACUTE WQ STDS MG/L	EPA ACUTE H2O QUAL CRITERIA MG/L	FINAL ACUTE CRITERIA MG/L	MCLs MG/L	OTHER CRITERIA	POLLUTANT
ARSENIC		0.01		0.0100	0.05		ARSENIC
CADMIUM		0.0025	0.0029	0.0025	0.005		CADMIUM
CHROMIUM - TOTAL		2.2914	2.2914	0.1000	0.1		CHROMIUM - TOTAL
CHROMIUM (III)		2.29	2.2914	0.1000	0.1		CHROMIUM (III)
CHROMIUM (VI)		0.016	0.0160	0.0160			CHROMIUM (VI)
COPPER	0.013	0.018	0.0184	0.0184	1		COPPER
LEAD		0.119	0.1185	0.0150	0.015		LEAD
MERCURY		0.00005	0.0024	0.0001	0.002		MERCURY
MOLYBDENUM						0.08	MOLYBDENUM
NICKEL		0.601	0.6010	0.6010			NICKEL
SELENIUM		0.02	0.02	0.0200	0.05		SELENIUM
SILVER		0.007	0.0063	0.0067	0.1		SILVER
ZINC	0.11	0.154	0.1535	0.1535	5		ZINC

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B	C	D	E	F	G	H	I	J	K	L
Monthly TABLE 3: CRITERIA AND STANDARDS POLLUTANT	Monthly NPDES PERMIT LIMITS MG/L	STATE CHRONIC WQ STDS MG/L	EPA CHRONIC H2O QUAL CRITERIA MG/L	FINAL CHRONIC CRITERIA MG/L	POLLUTANT	STATE HUMAN HEALTH CRITERIA MG/L	EPA HUMAN HEALTH CRITERIA MG/L	Final HUMAN HEALTH CRITERIA MG/L	OTHER CRITERIA State Chronic Agriculture mg/l	POLLUTANT
ARSENIC		0.01		0.0100	ARSENIC	0.01		0.01		ARSENIC
CADMIUM		0.0010	0.000336	0.0010	CADMIUM	0.005		0.005		CADMIUM
CHROMIUM - TOTAL		0.110		0.1095	CHROMIUM - TOTAL	0.1		0.1		CHROMIUM - TOTAL
CHROMIUM (III)		0.110	0.1095	0.1095	CHROMIUM (III)					CHROMIUM (III)
CHROMIUM (VI)		0.011	0.011	0.0110	CHROMIUM (VI)					CHROMIUM (VI)
COPPER	0.009	0.0120	0.0120	0.0120	COPPER	1.3		1.3		COPPER
LEAD		0.005	0.0046	0.0046	LEAD	0.015		0.015		LEAD
MERCURY		0.00091	0.000012	0.0009	MERCURY	0.002		0.002		MERCURY
MOLYBDENUM				0.0800	MOLYBDENUM		0.08	0.08		MOLYBDENUM
NICKEL		0.067	0.0668	0.0668	NICKEL	0.1		0.1		NICKEL
SELENIUM		0.005	0.005	0.0050	SELENIUM	0.05		0.05		SELENIUM
SILVER		0.1		0.1000	SILVER	0.1		0.1		SILVER
ZINC	0.11	0.154	0.1535	0.1535	ZINC	2		2		ZINC

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THIS INFORMATION IS ONLY NECESSARY IF YOU ARE CALCULATING REMOVAL EFFICIENCY FROM POTW INF AND EFF DATA ONLY (See Rem Eff TABLE)

B	C	D	E	F	G	H	I	J	K
TABLE 4: INFLUENT AND EFFLUENT DATA									
POLLUTANT	AVERAGE POTW INFLUENT MG/L	POTW FLOW MGD	COMMENT AND NOTES	POTW INFLUENT LBS/DAY	AVERAGE POTW EFFLUENT MG/L	POTW FLOW MGD	COMMENT AND NOTES	POTW EFFLUENT LBS/DAY	POLLUTANT
ARSENIC	0.005	4.39	where ND, assume 1/2*detection limit	0.183063	0.004	4.39	where ND, assume 1/2*detection limit	0.1464504	ARSENIC
CADMIUM	0.00016	4.39	where ND, assume 1/2*detection limit	0.00585802	0.0001	4.39	where ND, assume 1/2*detection limit	0.00366126	CADMIUM
CHROMIUM - TOTAL	0.0024	4.39	where ND, assume 1/2*detection limit	0.08787024	0.001	4.39	where ND, assume 1/2*detection limit	0.0366126	CHROMIUM - TOTAL
CHROMIUM (III)	0.0022	4.39	where ND, assume 1/2*detection limit	0.08054772	0.0011	4.39	where ND, assume 1/2*detection limit	0.04027386	CHROMIUM (III)
CHROMIUM (VI)	0.001	4.39	where ND, assume 1/2*detection limit	0.0366126	0.0005	4.39	where ND, assume 1/2*detection limit	0.0183063	CHROMIUM (VI)
COPPER	0.09	4.39	where ND, assume 1/2*detection limit	3.295134	0.009	4.39	where ND, assume 1/2*detection limit	0.3295134	COPPER
LEAD	0.006	4.39	where ND, assume 1/2*detection limit	0.2196756	0.00049	4.39	where ND, assume 1/2*detection limit	0.01794017	LEAD
MERCURY	0.000063	4.39	where ND, assume 1/8*detection limit	0.00230659	0.0000102	4.39	where ND, assume 1/8*detection limit	0.00037345	MERCURY
MOLYBDENUM	0.0057	4.39	where ND, assume 1/2*detection limit	0.20869182	0.0046	4.39	where ND, assume 1/2*detection limit	0.16841796	MOLYBDENUM
NICKEL	0.0084	4.39	where ND, assume 1/2*detection limit	0.30754584	0.006	4.39	where ND, assume 1/2*detection limit	0.2196756	NICKEL
SELENIUM	0.002	4.39	where ND, assume 1/2*detection limit	0.0732252	0.0017	4.39	where ND, assume 1/2*detection limit	0.06224142	SELENIUM
SILVER	0.0001	4.39	where ND, assume 1/2*detection limit	0.00366126	0.00028	4.39	where ND, assume 1/2*detection limit	0.01025153	SILVER
ZINC	0.158	4.39	where ND, assume 1/2*detection limit	5.7847908	0.077	4.39	where ND, assume 1/2*detection limit	2.8191702	ZINC

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Purple Areas are Optional Data Entry Columns

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
TABLE 5: POLLUTANT LOADING AND RECEIVING WATER POLLUTANT	TOTAL CURRENT SIU LOADING TO POTW LBS/D		DOMESTIC CONTRIBUTION TO POTW MG/L	USER ENTERED DOMESTIC LOADING TO POTW LBS/DAY		FINAL CALCULATED DOMESTIC CONTRIBUTION LBS/DAY	POLLUTANT		COMMERCIAL USER DISCHARGE TO POTW MG/L	USER ENTERED COMMERCIAL LOADING TO POTW LBS/DAY		CALCULATED COMMERCIAL CONTRIBUTION LBS/DAY	TOTAL DOMESTIC PLUS COMMERCIAL LOADING LBS/D	USER ENTERED TRUCKED AND HAULED WASTE LOADING TO POTW LBS/DAY	UPSTREAM RECEIVING WATER MG/L	POLLUTANT
ARSENIC	0.00042534		0.005	0.111349842		0.111349842	ARSENIC		0.008	0.112766808		0.112766808	0.22411665	0.001876083	0.006	ARSENIC
CADMIUM	0.00106335		0.0005	0.011134984		0.011134984	CADMIUM		0.0004	0.00563834		0.00563834	0.016773325	7.50433E-05	0.00028	CADMIUM
CHROMIUM - TOTAL	0.00552942		0.003	0.066809905		0.066809905	CHROMIUM - TOTAL		0.003	0.042287553		0.042287553	0.109097458	0.002455963	0.0008	CHROMIUM - TOTAL
CHROMIUM (III)	0.00404073		0.002	0.044539937		0.044539937	CHROMIUM (III)		0.003	0.042287553		0.042287553	0.08682749	0.002387742	0.0008	CHROMIUM (III)
CHROMIUM (VI)	0.001680093		0.001	0.022269968		0.022269968	CHROMIUM (VI)		0.001	0.014095851		0.014095851	0.036365819	0.000211486	0.0005	CHROMIUM (VI)
COPPER	0.07911324		0.103	2.293806745		2.293806745	COPPER		0.059	0.831655209		0.831655209	3.125461954	0.060716868	0.010	COPPER
LEAD	0.00276471		0.009	0.200429716		0.200429716	LEAD		0.003	0.042287553		0.042287553	0.242717269	0.002524184	0.01172	LEAD
MERCURY	1.59503E-05		0.00002	0.000445399		0.000445399	MERCURY		0.00002	0.000281917		0.000281917	0.000727316	4.0578E-05	0.000013	MERCURY
MOLYBDENUM	0.000786879		0.007	0.155889779		0.155889779	MOLYBDENUM		0.007	0.098670957		0.098670957	0.254560736	0.003660067	0.0047	MOLYBDENUM
NICKEL	0.02637108		0.011	0.244969652		0.244969652	NICKEL		0.01	0.14095851		0.14095851	0.385928162	0.003172286	0.005	NICKEL
SELENIUM	0.00063801		0.002	0.044539937		0.044539937	SELENIUM		0.002	0.028191702		0.028191702	0.072731639	0.000920986	0.0012	SELENIUM
SILVER	0.000106335		0.0002	0.004453994		0.004453994	SILVER		0.0003	0.004228755		0.004228755	0.008682749	0.000122798	0.00025	SILVER
ZINC	0.09314946		0.216	4.810313174		4.810313174	ZINC		0.152	2.142569352		2.142569352	6.952882526	0.19443042	0.082	ZINC
Lbs/day calculated. Result not rounded to minimize rounding errors																

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B	C	D	E	F	G	H	I	J
TABLE 6: BIOSOLIDS POLLUTANT	POTW BIOSOLIDS TO DISPOSAL MG/KG DRY WT.	TABLE 1 MAXIMUM LAND APP SLUDGE CRITERIA MG/KG	TABLE 3 "CLEAN" LAND APP SLUDGE CRITERIA MG/KG	TABLE 2 (CAR) CUMULATIVE APPLICATION RATE LBS/ACRE	TABLE 2 CALC. SLUDGE DISPOSAL CRITERIA MG/KG	ENTER DEFAULT BIOSOLIDS DISPOSAL CRITERIA MG/KG	FINAL SLUDGE CRITERIA MG/KG	POLLUTANT
ARSENIC	9.06		41				41.00	ARSENIC
CADMIUM	1.29		39				39.00	CADMIUM
CHROMIUM - TOTAL	12.5						No Criteria	CHROMIUM - TOTAL
CHROMIUM (III)	12.5						No Criteria	CHROMIUM (III)
CHROMIUM (VI)	0.76						No Criteria	CHROMIUM (VI)
COPPER	568		1500				1500.00	COPPER
LEAD	27		300				300.00	LEAD
MERCURY	0.57		17				17.00	MERCURY
MOLYBDENUM	10.5		75				75.00	MOLYBDENUM
NICKEL	26.1		420				420.00	NICKEL
SELENIUM	2.97		100				100.00	SELENIUM
SILVER	2.47						No Criteria	SILVER
ZINC	585		2800				2800.00	ZINC

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Purple Areas are Optional Data Entry Columns

B	C	D	E	F	G	H	I	J	K	L	M	N	O
TABLE 7: REMOVAL EFFICIENCY CALCULATIONS	INFEFF	ADRE	MRE	DECILE	LIT		ENTER THE NAME OF THE REMOVAL EFFICIENCY TO BE USED: INFEFF, ADRE, MRE, DECILE, OR LIT		USER ENTERED SLUDGE REMOVAL EFFICIENCY %	USE SLUDGE REMOVAL EFFICIENCY? Y/N		FINAL POTW REMOVAL %	
Removal Efficiency must be Positive	Influent/Effluent Method Removal Efficiency %	ADRE METHOD REMOVAL EFFICIENCY %	MRE METHOD REMOVAL EFFICIENCY %	DECILE METHOD REMOVAL EFFICIENCY %	LITERATURE REMOVAL EFFICIENCY %	SOURCE OF LITERATURE REMOVAL EFFICIENCY DATA							
POLLUTANT													POLLUTANT
ARSENIC	20	21.4	24.8	20.0	49	EPA Region 8 Appendix K	INFEFF			N		20	ARSENIC
CADMIUM	38	41.2	34.8	61.8	64	EPA Region 8 Appendix K	LIT			N		64	CADMIUM
CHROMIUM - TOTAL	58	62.3	58.9	75.0	77	EPA Region 8 Appendix K	INFEFF			N		58	CHROMIUM - TOTAL
CHROMIUM (III)	50	63.2	49.6	75.0	77	EPA Region 8 Appendix K	INFEFF			N		50	CHROMIUM (III)
CHROMIUM (VI)	50	84.4	44.2		77	EPA Region 8 Appendix K	INFEFF			N		50	CHROMIUM (VI)
COPPER	90	88.9	89.8	90.7	86	EPA Region 8 Appendix K	DECILE			N		91	COPPER
LEAD	92	83.6	91.3	88.9	63	EPA Region 8 Appendix K	DECILE			N		89	LEAD
MERCURY	84	75.0	83.9	90.0	62	EPA Region 8 Appendix K	INFEFF			N		84	MERCURY
MOLYBDENUM	19	22.6	19.4	14.3	29	EPA Region 8 Appendix K	INFEFF			N		19	MOLYBDENUM
NICKEL	29	34.5	30.4	46.4	40	EPA Region 8 Appendix K	INFEFF			N		29	NICKEL
SELENIUM	15	21.8	26.4	0.0	48	EPA Region 8 Appendix K	INFEFF			N		15	SELENIUM
SILVER	-180		0.0		77	EPA Region 8 Appendix K	LIT			N		77	SILVER
ZINC	51	47.4	49.0	47.8	73	EPA Region 8 Appendix K	INFEFF			N		51	ZINC

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B	C	D	E	F	G	H	I
DAILY TABLE 8: MAHL CALCULATIONS POLLUTANT	Daily/7 day NPDES LOADING LBS/DAY	ACUTE LOADING LBS/DAY	LOADING FOR MCL LBS/DAY	OTHER CRITERIA FROM Daily Criteria&Stds COLUMN H	MOST STRINGENT CRITERIA LBS/DAY	NAME OF MAHL FOR DAILY MAX LIMITS	POLLUTANT
ARSENIC	999999	0.4576575	2.2882875	999999	0.4576575	WQ-ACUTE	ARSENIC
CADMIUM	999999	0.257376263	0.508508333	999999	0.257376263	WQ-ACUTE	CADMIUM
CHROMIUM - TOTAL	999999	8.787024	8.787024	999999	8.787024	WQ-ACUTE	CHROMIUM - TOTAL
CHROMIUM (III)	999999	7.32252	7.32252	999999	7.32252	WQ-ACUTE	CHROMIUM (III)
CHROMIUM (VI)	999999	1.1716032	999999	999999	1.1716032	WQ-ACUTE	CHROMIUM (VI)
COPPER	5.117890323	7.26114558	393.683871	999999	5.117890323	NPDES Daily	COPPER
LEAD	999999	4.94319532	4.94319532	999999	4.94319532	WQ-ACUTE	LEAD
MERCURY	999999	0.011306832	0.452273294	999999	0.011306832	WQ-ACUTE	MERCURY
MOLYBDENUM	999999	999999	999999	3.629422957	3.629422957	OTHER	MOLYBDENUM
NICKEL	999999	30.80514963	999999	999999	30.80514963	WQ-ACUTE	NICKEL
SELENIUM	999999	0.861472941	2.153682353	999999	0.861472941	WQ-ACUTE	SELENIUM
SILVER	999999	1.06886527	15.91852174	999999	1.06886527	WQ-ACUTE	SILVER
ZINC	8.263986857	11.53477561	375.6357662	999999	8.263986857	NPDES Daily	ZINC

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B	C	D	E	F	G	H	I	J
MONTHLY TABLE 9: MAHL CALCULATIONS POLLUTANT	Monthly NPDES LOADING LBS/DAY	CHRONIC Toxicity Loading LBS/DAY	LOADING FOR HUMAN HEALTH LBS/DAY	OTHER CRITIERIA FROM Mo Criteria&Stds Column K State Chronic Agriculture mg/l	TABLE 1, 2, 3 OR OTHER SLUDGE LOADING LBS/DAY	MOST STRINGENT CRITERIA LBS/DAY	NAME OF MAHL For Monthly Limits	POLLUTANT
ARSENIC	999999	0.4576575	0.4576575	999999	0.61025006	0.4576575	WQ-CHRONIC	ARSENIC
CADMIUM	999999	0.101499158	0.508508333	999999	0.181400551	0.101499158	WQ-CHRONIC	CADMIUM
CHROMIUM - TOTAL	999999	9.623775949	8.787024	999999	999999	8.787024	HH	CHROMIUM - TOTAL
CHROMIUM (III)	999999	8.019813291	999999	999999	999999	8.019813291	WQ-CHRONIC	CHROMIUM (III)
CHROMIUM (VI)	999999	0.8054772	999999	999999	999999	0.8054772	WQ-CHRONIC	CHROMIUM (VI)
COPPER	3.543154839	4.716170141	511.7890323	999999	4.923091885	3.543154839	NPDES Monthly	COPPER
LEAD	999999	1.521827343	4.94319532	999999	1.004667418	1.004667418	Biosolids	LEAD
MERCURY	999999	0.205784349	0.452273294	999999	0.060382281	0.060382281	Biosolids	MERCURY
MOLYBDENUM	999999	3.629422957	3.629422957	999999	1.156904215	1.156904215	Biosolids	MOLYBDENUM
NICKEL	999999	3.424932871	5.125764	999999	4.375939453	3.424932871	WQ-CHRONIC	NICKEL
SELENIUM	999999	0.215368235	2.153682353	999999	1.98455304	0.215368235	WQ-CHRONIC	SELENIUM
SILVER	999999	15.91852174	15.91852174	999999	999999	15.91852174	WQ-CHRONIC	SILVER
ZINC	8.263986857	11.53477561	150.2543065	999999	16.25863454	8.263986857	NPDES Monthly	ZINC

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1000000

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
TABLE 12: DAILY LOCAL LIMITS where also calc monthly POLLUTANT	Daily MAHL	FINAL MAHL FOR DAILY LOCAL LIMITS	Name FOR MAHL	SAFETY/ EXPANSION FACTOR % FOR DAILY MAX LIMITS	MAHL WITH SAFETY - EXPANSION FACTOR LBS/DAY	ENTER "Y" FOR for a SIU and a Commercial Limit ENTER A "N" FOR SIU Limit Only	MAHL minus DOM + COM LOADING LBS/DAY	**Maximum Allowable Load MAL LBS/DAY**	**MAL is for**	MASS **RESERVED** FOR HAULED WASTE lbs/d	**MAL** MINUS THE HAULED WASTE LBS/DAY	POLLUTANT	If you are adopting a Commercial Limit, then these are the loadings from Table 5 lbs/day	If setting **SIU and Commercial limits** Enter % of MAL to allocate to SIUs **Enter 100% if no Commercial Limit** %	Percentage of MAL that will be allocated to Commercial Users %	MACL Calculated ALLOCATION FOR COMMERCIAL LBS/DAY	MAIL Calculated ALLOCATION FOR SIUs LBS/DAY	CALCULATED UNIFORM LOCAL LIMITS FOR SIUs MG/L	POLLUTANT
ARSENIC	0.4576575	0.4576575	WQ-ACUTE	20	0.366126	n	0.14200935	0.14200935	SIUs	0.000	0.14200935	ARSENIC		100.0	n/a	n/a	0.14200935	0.670	ARSENIC
CADMIUM	0.257376263	0.257376263	WQ-ACUTE	20	0.20590101	n	0.189127686	0.189127686	SIUs	0.000	0.189127686	CADMIUM		100.0	n/a	n/a	0.189127686	0.892	CADMIUM
CHROMIUM - TOTAL	8.787024	8.787024	WQ-ACUTE	90	0.8787024	n	0.769604942	0.769604942	SIUs	0.000	0.769604942	CHROMIUM - TOTAL		100.0	n/a	n/a	0.769604942	3.629	CHROMIUM - TOTAL
CHROMIUM (III)	7.32252	7.32252	WQ-ACUTE	90	0.732252	n	0.64542451	0.64542451	SIUs	0.000	0.64542451	CHROMIUM (III)		100.0	n/a	n/a	0.64542451	3.044	CHROMIUM (III)
CHROMIUM (VI)	1.1716032	1.1716032	WQ-ACUTE	70	0.35148096	n	0.315115141	0.315115141	SIUs	0.000	0.315115141	CHROMIUM (VI)		100.0	n/a	n/a	0.315115141	1.486	CHROMIUM (VI)
COPPER	5.117890323	5.117890323	NPDES Daily	<5	4.350206774	n	1.22474482	1.22474482	SIUs	0.225	1	COPPER		100.0	n/a	n/a	1	4.716	COPPER
LEAD	4.94319532	4.94319532	WQ-ACUTE	60	2.47159766	n	2.228880391	2.228880391	SIUs	1.229	1	LEAD		100.0	n/a	n/a	1	4.716	LEAD
MERCURY	0.011306832	0.011306832	WQ-ACUTE	20	0.009045466	n	0.008318149	0.008318149	SIUs	0.000	0.008318149	MERCURY		100.0	n/a	n/a	0.008318149	0.0392	MERCURY
MOLYBDENUM	3.629422957	3.629422957	OTHER	70	1.088826887	n	0.834266151	0.834266151	SIUs	0.000	0.834266151	MOLYBDENUM		100.0	n/a	n/a	0.834266151	3.934	MOLYBDENUM
NICKEL	30.80514963	30.80514963	WQ-ACUTE	70	9.24154489	n	8.855616727	8.855616727	SIUs	7.856	1	NICKEL		100.0	n/a	n/a	1	4.716	NICKEL
SELENIUM	0.861472941	0.861472941	WQ-ACUTE	20	0.689178353	n	0.616446714	0.616446714	SIUs	0.000	0.616446714	SELENIUM		100.0	n/a	n/a	0.616446714	2.907	SELENIUM
SILVER	1.06886527	1.06886527	WQ-ACUTE	70	0.320659581	n	0.311976832	0.311976832	SIUs	0.000	0.311976832	SILVER		100.0	n/a	n/a	0.311976832	1.471	SILVER
ZINC	8.263986857	8.263986857	NPDES Daily	<5	7.024388829	n	0.071506302	0.071506302	SIUs	0.000	0.071506302	ZINC		100.0	n/a	n/a	0.071506302	0.3372	ZINC

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B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
TABLE 13: MONTHLY LOCAL LIMITS POLLUTANT	MONTHLY MAHL	FINAL MAHL FOR Monthly LOCAL LIMITS	NAME FROM TABLE 6 FOR MAHL	SAFETY/ EXPANSION FACTOR % FOR DAILY MAX LIMITS	MAHL WITH SAFETY - EXPANSION FACTOR LBS/DAY	ENTER "Y" FOR for a SIU and a Commercial Limit ENTER A "N" FOR SIU Limit Only	MAHL minus DOM + COM LOADING LBS/DAY	**Maximum Allowable Load MAL LBS/DAY**	**MAL is for**	POLLUTANT	If you are adopting a Commercial Limit, then these are the loadings from Table 5 lbs/day	Percentage of MAL to allocate to SIUs Only %	Percentage of MAL that will be allocated to Commercial Users %	MACL Calculated ALLOCATION FOR COMMERCIAL LBS/DAY	MAIL Calculated ALLOCATION FOR SIUs LBS/DAY	CALCULATED UNIFORM LOCAL LIMITS FOR SIUs MG/L	POLLUTANT
ARSENIC	0.4576575	0.4576575	WQ-CHRONIC	20	0.366126	n	0.14200935	0.14200935	SIUs	ARSENIC		100.0	n/a	0 Discharge due to SIU Allocation	0.14200935	0.670	ARSENIC
CADMIUM	0.101499158	0.101499158	WQ-CHRONIC	20	0.081199326	n	0.064426002	0.064426002	SIUs	CADMIUM		100.0	n/a	0 Discharge due to SIU Allocation	0.064426002	0.304	CADMIUM
CHROMIUM - TOTAL	8.787024	8.787024	HH	90	0.8787024	n	0.769604942	0.769604942	SIUs	CHROMIUM - TOTAL		100.0	n/a	0 Discharge due to SIU Allocation	0.769604942	3.629	CHROMIUM - TOTAL
CHROMIUM (III)	8.019813291	8.019813291	WQ-CHRONIC	90	0.801981329	n	0.715153839	0.715153839	SIUs	CHROMIUM (III)		100.0	n/a	0 Discharge due to SIU Allocation	0.715153839	3.372	CHROMIUM (III)
CHROMIUM (VI)	0.8054772	0.8054772	WQ-CHRONIC	70	0.24164316	n	0.205277341	0.205277341	SIUs	CHROMIUM (VI)		100.0	n/a	0 Discharge due to SIU Allocation	0.205277341	0.968	CHROMIUM (VI)
COPPER	3.543154839	3.543154839	NPDES Monthly	11	3.153407806	n	0.027945852	0.027945852	SIUs	COPPER		100.0	n/a	0 Discharge due to SIU Allocation	0.027945852	0.132	COPPER
LEAD	1.004667418	1.004667418	Biosolids	50	0.502333709	n	0.25961644	0.25961644	SIUs	LEAD		100.0	n/a	0 Discharge due to SIU Allocation	0.25961644	1.224	LEAD
MERCURY	0.060382281	0.060382281	Biosolids	20	0.048305825	n	0.047578509	0.047578509	SIUs	MERCURY		100.0	n/a	0 Discharge due to SIU Allocation	0.047578509	0.224	MERCURY
MOLYBDENUM	1.156904215	1.156904215	Biosolids	20	0.925523372	n	0.670962636	0.670962636	SIUs	MOLYBDENUM		100.0	n/a	0 Discharge due to SIU Allocation	0.670962636	3.164	MOLYBDENUM
NICKEL	3.424932871	3.424932871	WQ-CHRONIC	70	1.027479861	n	0.641551699	0.641551699	SIUs	NICKEL		100.0	n/a	0 Discharge due to SIU Allocation	0.641551699	3.025	NICKEL
SELENIUM	0.215368235	0.215368235	WQ-CHRONIC	20	0.172294588	n	0.099562949	0.099562949	SIUs	SELENIUM		100.0	n/a	0 Discharge due to SIU Allocation	0.099562949	0.470	SELENIUM
SILVER	15.91852174	15.91852174	WQ-CHRONIC	90	1.591852174	n	1.583169425	1.583169425	SIUs	SILVER		100.0	n/a	0 Discharge due to SIU Allocation	1.583169425	7.466	SILVER
ZINC	8.263986857	8.263986857	NPDES Monthly	15	7.024388829	n	0.071506302	0.071506302	SIUs	ZINC		100.0	n/a	0 Discharge due to SIU Allocation	0.071506302	0.337	ZINC

B	C	D	E	F	G	H	I	J	K	L	M	N
TABLE 14: LOCAL LIMIT SUMMARY FOR DAILY AND MONTHLY LL	**DAILY MAXIUM LOCAL LIMIT INFORMATION**						**MONTHLY AVERAGE LOCAL LIMIT INFORMATION**					
POLLUTANT	MAIL FOR SIUs LBS/DAY	UNIFORM CONCENTRATION FOR SIUs (MG/L)	MACL FOR COMMERCIAL USERS (LBS/DAY)	PROPOSED DAILY MAX LIMIT	PROPOSED MACL FOR COMMERCIAL USERS	POLLUTANT	MAIL FOR SIUs LBS/DAY	UNIFORM CONCENTRATION FOR SIUs (MG/L)	MACL FOR COMMERCIAL USERS (LBS/DAY)	PROPOSED MONTHLY AVERAGE LIMIT	PROPOSED MACL FOR COMMERCIAL USERS	POLLUTANT
				mg/L						mg/L		
ARSENIC	0.1420	0.6697	n/a	0.66	n/a	ARSENIC	0.142009	0.669672	Discharge due to SIU Allocatio	0.66	n/a	ARSENIC
CADMIUM	0.1891	0.8919	n/a	0.89	n/a	CADMIUM	0.064426	0.303813	Discharge due to SIU Allocatio	0.30	n/a	CADMIUM
CHROMIUM - TOTAL	0.7696	3.6292	n/a	3.62	n/a	CHROMIUM - TOTAL	0.769605	3.629219	Discharge due to SIU Allocatio	3.62	n/a	CHROMIUM - TOTAL
CHROMIUM (III)	0.6454	3.0436	n/a	3.04	n/a	CHROMIUM (III)	0.715154	3.372445	Discharge due to SIU Allocatio	3.37	n/a	CHROMIUM (III)
CHROMIUM (VI)	0.3151	1.4860	n/a	1.48	n/a	CHROMIUM (VI)	0.205277	0.968025	Discharge due to SIU Allocatio	0.96	n/a	CHROMIUM (VI)
COPPER	1.0000	4.7157	n/a	4.71	n/a	COPPER	0.027946	0.131784	Discharge due to SIU Allocatio	0.027 lb/day	n/a	COPPER
LEAD	1.0000	4.7157	n/a	4.71	n/a	LEAD	0.259616	1.224271	Discharge due to SIU Allocatio	1.22	n/a	LEAD
MERCURY	0.0083	0.0392	n/a	0.039	n/a	MERCURY	0.047579	0.224366	Discharge due to SIU Allocatio	0.22	n/a	MERCURY
MOLYBDENUM	0.8343	3.9341	n/a	3.93	n/a	MOLYBDENUM	0.670963	3.164052	Discharge due to SIU Allocatio	3.16	n/a	MOLYBDENUM
NICKEL	1.0000	4.7157	n/a	4.71	n/a	NICKEL	0.641552	3.025360	Discharge due to SIU Allocatio	3.02	n/a	NICKEL
SELENIUM	0.6164	2.9070	n/a	2.90	n/a	SELENIUM	0.099563	0.469508	Discharge due to SIU Allocatio	0.46	n/a	SELENIUM
SILVER	0.3120	1.4712	n/a	1.47	n/a	SILVER	1.583169	7.465738	Discharge due to SIU Allocatio	7.46	n/a	SILVER
ZINC	0.0715	0.3372	n/a	0.33	n/a	ZINC	0.071506	0.337202	Discharge due to SIU Allocatio	0.33	n/a	ZINC

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A	B	C
TABLE 1 - GENERAL DATA ENTRY		
POTW NAME:	ity of Helena Wastewater Treatment Plant	
POTW HIGHEST MONTHLY AVERAGE FLOW **(MGD)**:	4.39	
DOMESTIC FLOW **(MGD)**:	2.6953764	
SIU FLOW **(MGD)**:	0.0003830	
COMMERCIAL FLOW **(MGD)**:	1.69[illegible]	
TRUCKED AND HAULED WASTE FLOW **(MGD)**:	0.[illegible]409	
COMMERCIAL FLOW AS A % OF ALL NON-DOMESTIC	100	
TOTAL **COMMERCIAL** FLOW AS A % OF TOTAL POTW FLOW	39	
TOTAL NON-DOMESTIC FLOW AS A % OF TOTAL POTW FLOW	39	
SPECIFIC GRAVITY OF SLUDGE TO DISPOSAL (kg/L)	1.0	See Appendix M of the Strategy
SLUDGE FLOW TO DISPOSAL **(MGD)**:	0.0[illegible]	
% SOLIDS TO DISPOSAL **(%)**	1.9	
BIOSOLIDS TABLE (**1,3 OR "O"THER**) BASED ON DISPOSAL OPTION:	3	
ARE YOU USING TABLE 2 FOR BIOSOLIDS **(Y/N)**?:	N	
SITE AREA **(ACRES)**:	Not Using Table 2	
SITE LIFE **(YEARS)**:	Not Using Table 2	
CHRONIC RECEIVING WATER FLOW **(MGD)**:	0	
ACUTE RECEIVING WATER FLOW **(MGD)**:	0	
HARDNESS FOR METALS CALCULATIONS **(MG/L)**:	104	
IS YOUR RECEIVING WATER A DRINKING WATER SUPPLY **(Y/N)**?:	Y	
APPLICABLE STANDARDS (ACUTE, CHRONIC, BOTH):	B	**A,C OR B**

Spreadsheet

Please email Curt A McCormick at mccormick.curt@epa.gov with any comments if you are in Region 8 Not supported outside of Region 8 Pretretment Programs

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B	C	D	E	F	G	H	I
Daily TABLE 2: CRITERIA AND STANDARDS POLLUTANT	Daily Max/7 Day NPDES PERMIT LIMITS MG/L	STATE ACUTE WQ STDS MG/L	EPA ACUTE H2O QUAL CRITERIA MG/L	FINAL ACUTE CRITERIA MG/L	MCLs MG/L	OTHER CRITERIA	POLLUTANT
ARSENIC		0.01	[illegible]	0.100[illegible]	0.05		ARSENIC
CADMIUM		0.00[illegible]	0.002[illegible]	0.0020	0.005		CADMIUM
CHROMIUM - TOTAL		1.86[illegible]	1.8619[illegible]	0.1000	0.1		CHROMIUM - TOTAL
CHROMIUM (III)		1.86	1.8619	0.1000	0		CHROMIUM (III)
CHROMIUM (VI)		0.016	0.0160	0.01[illegible]			CHROMIUM (VI)
COPPER	0.01[illegible]	0.015	0.0145	0.045	1		COPPER
LEAD		0.086	0.0858	0.0150	0.015		LEAD
MERCURY		0.00005	0.0024	0.0001	0.002		MERCURY
MOLYBDENUM						0.08	MOLYBDENUM
NICKEL		0.485	0.4850	0.4850			NICKEL
SELENIUM		0.02	0.02	0.0200	0.05		SELENIUM
SILVER		0.004	0.0040	0.0043	0.1		SILVER
ZINC	0.11	0.124	0.1239	0.1239	5		ZINC

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B	C	D	E	F	G	H	I	J	K	L
Monthly TABLE 3: CRITERIA AND STANDARDS									OTHER CRITERIA	
	Monthly NPDES PERMIT LIMITS	STATE CHRONIC WQ STDS	EPA CHRONIC H2O QUAL CRITERIA	FINAL CHRONIC CRITERIA		STATE HUMAN HEALTH CRITERIA	EPA HUMAN HEALTH CRITERIA	Final HUMAN HEALTH CRITERIA	State Chronic Agriculture	
POLLUTANT	MG/L	MG/L	MG/L	MG/L	POLLUTANT	MG/L	MG/L	MG/L	mg/l	POLLUTANT
ARSENIC		0.01		0.0100	ARSENIC	0.01		0.01		ARSENIC
CADMIUM		0.0008	0.000279	0.0008	CADMIUM	0.005		0.005		CADMIUM
CHROMIUM - TOTAL		0.089		0.0890	CHROMIUM - TOTAL	0.1		0.1		CHROMIUM - TOTAL
CHROMIUM (III)		0.089	0.0890	0.0890	CHROMIUM (III)					CHROMIUM (III)
CHROMIUM (VI)		0.011	0.011	0.0110	CHROMIUM (VI)					CHROMIUM (VI)
COPPER	0.009	0.0096	0.0096	0.0096	COPPER	1.3		1.3		COPPER
LEAD		0.013	0.0033	0.0033	LEAD	0.015		0.015		LEAD
MERCURY		0.00091	0.000012	0.0009	MERCURY	0.002		0.002		MERCURY
MOLYBDENUM				0.0800	MOLYBDENUM		0.08	0.08		MOLYBDENUM
NICKEL		0.05	0.0539	0.0539	NICKEL	0.1		0.1		NICKEL
SELENIUM		0.005	0.005	0.0050	SELENIUM	0.05		0.05		SELENIUM
SILVER		0.1		0.1000	SILVER	0.1		0.1		SILVER
ZINC	0.11	0.124	0.1239	0.1239	ZINC	2		2		ZINC

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THIS INFORMATION IS ONLY NECESSARY IF YOU ARE CALCULATING REMOVAL EFFICIENCY FROM POTW INF AND EFF DATA ONLY (See Rem Eff TABLE)

B	C	D	E	F	G	H	I	J	K
TABLE 4: INFLUENT AND EFFLUENT DATA									
POLLUTANT	AVERAGE POTW INFLUENT MG/L	POTW FLOW MGD	COMMENT AND NOTES	POTW INFLUENT LBS/DAY	AVERAGE POTW EFFLUENT MG/L	POTW FLOW MGD	COMMENT AND NOTES	POTW EFFLUENT LBS/DAY	POLLUTANT
ARSENIC	0.005	4.39	where ND, assume 1/2*detection limit	0.183063	0.004	4.39	where ND, assume 1/2*detection limit	0.1464504	ARSENIC
CADMIUM	0.00016	4.39	where ND, assume 1/2*detection limit	0.00585802	0.0001	4.39	where ND, assume 1/2*detection limit	0.00366126	CADMIUM
CHROMIUM - TOTAL	0.0024	4.39	where ND, assume 1/2*detection limit	0.08787024	0.001	4.39	where ND, assume 1/2*detection limit	0.0366126	CHROMIUM - TOTAL
CHROMIUM (III)	0.0022	4.39	where ND, assume 1/2*detection limit	0.08054772	0.0011	4.39	where ND, assume 1/2*detection limit	0.04027386	CHROMIUM (III)
CHROMIUM (VI)	0.001	4.39	where ND, assume 1/2*detection limit	0.03661126	0.0005	4.39	where ND, assume 1/2*detection limit	0.0183063	CHROMIUM (VI)
COPPER	0.09	4.39	where ND, assume 1/2*detection limit	3.29513	0.09	4.39	where ND, assume 1/2*detection limit	0.3295134	COPPER
LEAD	0.006	4.39	where ND, assume 1/2*detection limit	0.21937756	0.00049	4.39	where ND, assume 1/2*detection limit	0.01794017	LEAD
MERCURY	0.000063	4.39	where ND, assume 1/8*detection limit	0.00230659	0.0000102	4.39	where ND, assume 1/8*detection limit	0.00037345	MERCURY
MOLYBDENUM	0.0057	4.39	where ND, assume 1/2*detection limit	0.20869182	0.0046	4.39	where ND, assume 1/2*detection limit	0.16841796	MOLYBDENUM
NICKEL	0.0084	4.39	where ND, assume 1/2*detection limit	0.30754584	0.006	4.39	where ND, assume 1/2*detection limit	0.2196756	NICKEL
SELENIUM	0.002	4.39	where ND, assume 1/2*detection limit	0.07322253	0.0017	4.39	where ND, assume 1/2*detection limit	0.06224142	SELENIUM
SILVER	0.0001	4.39	where ND, assume 1/2*detection limit	0.00366126	0.00028	4.39	where ND, assume 1/2*detection limit	0.01025153	SILVER
ZINC	0.158	4.39	where ND, assume 1/2*detection limit	5.78479[illegible]	0.07[illegible]	4.39	where ND, assume 1/2*detection limit	2.8191702	ZINC

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Purple Areas are Optional Data Entry Columns

B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
TABLE 5: POLLUTANT LOADING AND RECEIVING WATER POLLUTANT	TOTAL CURRENT SIU LOADING TO POTW LBS/D		DOMESTIC CONTRIBUTION TO POTW MG/L	USER ENTERED DOMESTIC LOADING TO POTW LBS/DAY		FINAL CALCULATED DOMESTIC CONTRIBUTION LBS/DAY	POLLUTANT		COMMERCIAL USER DISCHARGE TO POTW MG/L	USER ENTERED COMMERCIAL LOADING TO POTW LBS/DAY		CALCULATED COMMERCIAL CONTRIBUTION LBS/DAY	TOTAL DOMESTIC PLUS COMMERCIAL LOADING LBS/D	USER ENTERED TRUCKED AND HAULED WASTE LOADING TO POTW LBS/DAY	UPSTREAM RECEIVING WATER MG/L	POLLUTANT
ARSENIC	6.39845E-06		0.003	0.067438318		0.067438318	ARSENIC		0.005	0.070479255		0.070479255	0.137917573	[illegible]	0.006	ARSENIC
CADMIUM	1.59961E-05		0.0002	[illegible]		0.004495888	CADMIUM		0.0002	0.00281917		0.00281917	0.007315058	[illegible]	0.00028	CADMIUM
CHROMIUM - TOTAL	8.31798E-05		0.002	[illegible]		0.044958878	CHROMIUM - TOTAL		0.003	0.042287553		0.042287553	0.087246431	[illegible]	0.0008	CHROMIUM - TOTAL
CHROMIUM (III)	6.07853E-05		[illegible]	[illegible]		0.044958878	CHROMIUM (III)		0.003	0.042287553		0.042287553	[illegible]	0.002387742	0.0008	CHROMIUM (III)
CHROMIUM (VI)	2.52739E-05		[illegible]	0.01123972		0.01123972	CHROMIUM (VI)		0.0005	0.007047926		[illegible]	[illegible]	0.000211486	0.0005	CHROMIUM (VI)
COPPER	[illegible]		[illegible]	1.708437377		1.708437377	COPPER		0.077	1.085380527		1.085380527	[illegible]	0.060716868	0.010	COPPER
LEAD	4.15891E-[illegible]		0.002	0.044958878		0.044958878	LEAD		0.003	0.042287553		[illegible]	0.087246431	0.002[illegible]184	0.01172	LEAD
MERCURY	2.39[illegible]		0.0000075	0.000168596		0.000168596	MERCURY		0.0000018	2.537255-05		2.537[illegible]25E-05	0.000193968	[illegible]285[illegible]05	0.000013	MERCURY
MOLYBDENUM	[illegible]371E-05		0.0087	[illegible]571121		0.195571121	MOLYBDENUM		0.0083	[illegible]6[illegible]556		0.1[illegible]995563	0.31[illegible]0[illegible]84	[illegible]30[illegible]67	0.0047	MOLYBDENUM
NICKEL	0.000396704		0.01[illegible]	[illegible]794392		0.224794392	NICKEL		0.009	0.1[illegible]862659		0.126862659	0.3[illegible]657051	[illegible]172286	0.005	NICKEL
SELENIUM	9.597675-06		0.002	[illegible]4958878		0.044958878	SELENIUM		0.003	0.042287[illegible]		0.042287553	0.087246431	0.000920986	0.0012	SELENIUM
SILVER	1.5991E-06		0.00[illegible]25	0.00561986		0.00561986	SILVER		0.0005	[illegible]047926		0.007[illegible]7926	0.012[illegible]7785	0.000122798	0.00025	SILVER
ZINC	0.001[illegible]0126		0.138	3.102162606		3.102162606	ZINC		0.217	3.058799667		3.058[illegible]99667	6.160962273	0.19443042	0.082	ZINC
Lbs/day calculated. Result not rounded to minimize rounding errors																

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TABLE 6: BIOSOLIDS POLLUTANT	POTW BIOSOLIDS TO DISPOSAL MG/KG DRY WT.	TABLE 1 MAXIMUM LAND APP SLUDGE CRITERIA MG/KG	TABLE 3 "CLEAN" LAND APP SLUDGE CRITERIA MG/KG	TABLE 2 (CAR) CUMULATIVE APPLICATION RATE LBS/ACRE	TABLE 2 CALC. SLUDGE DISPOSAL CRITERIA MG/KG	ENTER DEFAULT BIOSOLIDS DISPOSAL CRITERIA MG/KG	FINAL SLUDGE CRITERIA MG/KG	POLLUTANT
ARSENIC	9.06		41				41.00	ARSENIC
CADMIUM	1.29		39				39.00	CADMIUM
CHROMIUM - TOTAL	12.5						No Criteria	CHROMIUM - TOTAL
CHROMIUM (III)	12.5						No Criteria	CHROMIUM (III)
CHROMIUM (VI)	0.76						No Criteria	CHROMIUM (VI)
COPPER	568		1500				1500.00	COPPER
LEAD	27		300				300.00	LEAD
MERCURY	0.57		17				17.00	MERCURY
MOLYBDENUM	10.5		75				75.00	MOLYBDENUM
NICKEL	26.1		420				420.00	NICKEL
SELENIUM	2.97		100				100.00	SELENIUM
SILVER	2.47						No Criteria	SILVER
ZINC	585		2800				2800.00	ZINC

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Purple Areas are Optional Data Entry Columns

B	C	D	E	F	G	H	I	J	K	L	M	N	O
TABLE 7: REMOVAL EFFICIENCY CALCULATIONS Removal Efficiencies must be 1-99%	INFEFF **Influent/Effluent Method** Removal Efficiency	ADRE **ADRE METHOD** REMOVAL EFFICIENCY	MRE **MRE METHOD** REMOVAL EFFICIENCY	DECILE **DECILE METHOD** REMOVAL EFFICIENCY	LIT **LITERATURE** REMOVAL EFFICIENCY	SOURCE OF LITERATURE REMOVAL EFFICIENCY DATA	ENTER THE NAME OF THE REMOVAL EFFICIENCY TO BE USED: **INFEFF, ADRE, MRE,** **DECILE**, OR **LIT**		USER ENTERED SLUDGE REMOVAL EFFICIENCY	USE SLUDGE REMOVAL EFFICIENCY?		FINAL POTW REMOVAL	
POLLUTANT	%	%	%	%	%				%	Y/N		%	POLLUTANT
ARSENIC	20	21.4	24.8	20.0	49	EPA Region 8 Appendix K	INFEFF					20	ARSENIC
CADMIUM	38	41.2	34.8	61.8	64	EPA Region 8 Appendix K	LIT			N		64	CADMIUM
CHROMIUM - TOTAL	58	62.3	[illegible]	75.0	77	EPA Region 8 Appendix K	LIT			N		77	CHROMIUM - TOTAL
CHROMIUM (III)	50	63.2	[illegible]	75.0	77	EPA Region 8 Appendix K	LIT			N		77	CHROMIUM (III)
CHROMIUM (VI)	50	84.4	[illegible]		77	EPA Region 8 Appendix K	LIT			N		77	CHROMIUM (VI)
COPPER	90	88.9	[illegible]	90.7	86	EPA Region 8 Appendix K	INFEFF			N		90	COPPER
LEAD	92	[illegible]	91.3	88.9	63	EPA Region 8 Appendix K	DECILE			N		89	LEAD
MERCURY	84	[illegible]	83.9	90.0	62	EPA Region 8 Appendix K	INFEFF			N		84	MERCURY
MOLYBDENUM	19	22.6	19.4	14.3	[illegible]	EPA Region 8 Appendix K	LIT			N		29	MOLYBDENUM
NICKEL	29	34.5	30.4	46.4	40	EPA Region 8 Appendix K	INFEFF			N		29	NICKEL
SELENIUM	[illegible]	21.8	26.4	0.0	48	EPA Region 8 Appendix K	INFEFF			N		15	SELENIUM
SILVER	[illegible]		0.0		77	EPA Region 8 Appendix K	LIT			N		77	SILVER
ZINC	[illegible]	[illegible]	49.0	47.8	73	EPA Region 8 Appendix K	INFEFF			N		51.266	ZINC

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DAILY TABLE 8: MAHL CALCULATIONS POLLUTANT	Daily/7 day NPDES LOADING LBS/DAY	ACUTE LOADING LBS/DAY	LOADING FOR MCL LBS/DAY	OTHER CRITERIA FROM Daily Criteria&Stds COLUMN H	MOST STRINGENT CRITERIA LBS/DAY	NAME OF MAHL FOR DAILY MAX LIMITS	POLLUTANT
ARSENIC	999999	0.4576575	2.2882875	999999	0.4576575	WQ-ACUTE	ARSENIC
CADMIUM	999999	0.200825815	0.508508333	999999	0.200825815	WQ-ACUTE	CADMIUM
CHROMIUM - TOTAL	999999	15.91852174	15.91852174	999999	15.91852174	WQ-ACUTE	CHROMIUM - TOTAL
CHROMIUM (III)	999999	15.91852174	15.91852174	999999	15.91852174	WQ-ACUTE	CHROMIUM (III)
CHROMIUM (VI)	999999	2.546963478	999999	999999	2.546963478	WQ-ACUTE	CHROMIUM (VI)
COPPER	4.759638	5.318372644	366.126	999999	4.759638	NPDES Daily	COPPER
LEAD	999999	4.94319532	4.94319532	999999	4.94319532	WQ-ACUTE	LEAD
MERCURY	999999	0.011306832	0.452273292	999999	0.011306832	WQ-ACUTE	MERCURY
MOLYBDENUM	999999	999999	999999	4.12536338	4.12536338	OTHER	MOLYBDENUM
NICKEL	999999	24.86009983	999999	999999	24.86009983	WQ-ACUTE	NICKEL
SELENIUM	999999	0.861472941	2.152932353	999999	0.861472941	WQ-ACUTE	SELENIUM
SILVER	999999	0.691194154	15.91852174	999999	0.691194154	WQ-ACUTE	SILVER
ZINC	8.263986857	9.305626195	375.6357662	999999	8.263986857	NPDES Daily	ZINC

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MONTHLY TABLE 9: MAHL CALCULATIONS POLLUTANT	Monthly NPDES LOADING LBS/DAY	CHRONIC Toxicity Loading LBS/DAY	LOADING FOR HUMAN HEALTH LBS/DAY	OTHER CRITIERIA FROM Mo Criteria&Stds Column K State Chronic Agriculture mg/l	TABLE 1, 2, 3 OR OTHER SLUDGE LOADING LBS/DAY	MOST STRINGENT CRITERIA LBS/DAY	NAME OF MAHL For Monthly Limits	POLLUTANT
ARSENIC	999999	0.4576575	0.4576575	999999	0.61025006	0.4576575	WQ-CHRONIC	ARSENIC
CADMIUM	999999	0.082919836	0.508508333	999999	0.181400551	0.082919836	WQ-CHRONIC	CADMIUM
CHROMIUM - TOTAL	999999	14.16634783	15.91852174	999999	999999	14.16634783	WQ-CHRONIC	CHROMIUM - TOTAL
CHROMIUM (III)	999999	14.16634783	999999	999999	999999	14.16634783	WQ-CHRONIC	CHROMIUM (III)
CHROMIUM (VI)	999999	1.751037391	999999	999999	999999	1.751037391	WQ-CHRONIC	CHROMIUM (VI)
COPPER	3.295134	3.531964673	475.9638	999999	4.3613926	3.295134	NPDES Monthly	COPPER
LEAD	999999	1.102159417	4.94319532	999999	1.004667418	1.004667418	Biosolids	LEAD
MERCURY	999999	0.205784349	0.45227329	999999	0.060382281	0.060382281	Biosolids	MERCURY
MOLYBDENUM	999999	4.12536338	4.12536338	999999	0.769868714	0.769868714	Biosolids	MOLYBDENUM
NICKEL	999999	2.763959082	5.125364	999999	4.315939453	2.763959082	WQ-CHRONIC	NICKEL
SELENIUM	999999	0.215368235	2.153683353	999999	1.98[illegible]504	0.215368235	WQ-CHRONIC	SELENIUM
SILVER	999999	15.91852174	15.91852174	999999	999999	15.91852174	WQ-CHRONIC	SILVER
ZINC	8.263986857	9.305626195	150.2543065	999999	16.25863454	8.263986857	NPDES Monthly	ZINC

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TABLE 12: DAILY LOCAL LIMITS where also calc monthly POLLUTANT	Daily MAHL	FINAL MAHL FOR DAILY LOCAL LIMITS	Name FOR MAHL	SAFETY/ EXPANSION FACTOR % FOR DAILY MAX LIMITS	MAHL WITH SAFETY - EXPANSION FACTOR LBS/DAY	ENTER "Y" FOR for a SIU and a Commercial Limit ENTER A "N" FOR SIU Limit Only	MAHL Minus DOM LOADING LBS/DAY	**Maximum Allowable Load MAL LBS/DAY**	**MAL is for**	MASS **RESERVED** FOR HAULED WASTE lbs/d	**MAL** MINUS THE HAULED WASTE LBS/DAY	POLLUTANT	If you are adopting a Commercial Limit, then these are the loadings from Table 5 lbs/day	If setting **SIU and Commercial limits** Enter % of MAL to allocate to SIUs **Enter 100% if no Commercial Limit** %	Percentage of MAL that will be allocated to Commercial Users %	**MACL** Calculated ALLOCATION FOR COMMERCIAL LBS/DAY	**MAIL** Calculated ALLOCATION FOR SIUs LBS/DAY	CALCULATED UNIFORM LOCAL LIMITS FOR SIUs MG/L	POLLUTANT
ARSENIC	0.4576575	0.4576575	WQ-ACUTE	15	[illegible]	n	0.251091302	0.251091302	SIUs	0.000	0.251091302	ARSENIC		100.0	n/a	n/a	[illegible]1091302	78.712	ARSENIC
CADMIUM	0.200825815	0.200825815	WQ-ACUTE	15	[illegible]	n	0.163386885	0.163386885	SIUs	0.000	0.163386885	CADMIUM		100.0	n/a	n/a	0.163386885	51.218	CADMIUM
CHROMIUM - TOTAL	15.91852174	15.91852174	WQ-ACUTE	15	[illegible]	n	13.44349705	13.44349705	SIUs	0.000	13.44349705	CHROMIUM - TOTAL		100.0	n/a	n/a	13.44349705	4214.239	CHROMIUM - TOTAL
CHROMIUM (III)	15.91852174	[illegible]	WQ-ACUTE	15	[illegible]	n	13.44349705	13.44349705	SIUs	0.000	13.44349705	CHROMIUM (III)		100.0	n/a	n/a	13.44349705	4214.239	CHROMIUM (III)
CHROMIUM (VI)	2.546963478	[illegible]	WQ-ACUTE	15	2.164918957	n	2.146631311	2.146631311	SIUs	0.000	2.146631311	CHROMIUM (VI)		100.0	n/a	n/a	2.146631311	672.921	CHROMIUM (VI)
COPPER	[illegible]	[illegible]	[illegible]	15	4.0456923	n	1.251874396	1.251874396	SIUs	0.000	1.251874396	COPPER		100.0	n/a	n/a	1.251874396	392.435	COPPER
LEAD	[illegible]	[illegible]	WQ-ACUTE	15	[illegible]	n	4.11446959	4.11446959	SIUs	0.000	4.11446959	LEAD		100.0	n/a	n/a	4.11446959	1289.795	LEAD
MERCURY	[illegible]	[illegible]	WQ-ACUTE	15	[illegible]	n	0.009416839	0.009416839	SIUs	0.000	0.009416839	MERCURY		100.0	n/a	n/a	0.009416839	2.952	MERCURY
MOLYBDENUM	[illegible]	4.12536338	OTHER	15	[illegible]	n	3.193992189	3.193992189	SIUs	0.000	3.193992189	MOLYBDENUM		100.0	n/a	n/a	3.193992189	1001.246	MOLYBDENUM
NICKEL	[illegible]	24.86009983	WQ-ACUTE	15	[illegible]	n	20.7794278	20.7794278	SIUs	0.000	20.7794278	NICKEL		100.0	n/a	n/a	20.7794278	6513.891	NICKEL
SELENIUM	[illegible]	0.861472941	WQ-ACUTE	15	[illegible]	n	0.645005569	0.645005569	SIUs	0.000	0.645005569	SELENIUM		100.0	n/a	n/a	0.645005569	202.195	SELENIUM
SILVER	0.691194154	[illegible]	WQ-ACUTE	15	[illegible]	n	0.574847246	0.574847246	SIUs	0.000	0.574847246	SILVER		100.0	n/a	n/a	0.574847246	180.202	SILVER
ZINC	8.263986857	[illegible]	NODES Daily	15	7.024388829	n	0.863426555	0.863426555	SIUs	0.000	0.863426555	ZINC		100.0	n/a	n/a	0.863426555	270.665	ZINC

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TABLE 13: MONTHLY LOCAL LIMITS POLLUTANT	MONTHLY MAHL	FINAL MAHL FOR Monthly LOCAL LIMITS	NAME FROM TABLE 6 FOR MAHL	SAFETY/ EXPANSION FACTOR % FOR DAILY MAX LIMITS	MAHL WITH SAFETY - EXPANSION FACTOR LBS/DAY	ENTER "Y" FOR for a SIU and a Commercial Limit ENTER A "N" FOR SIU Limit Only	MAHL minus DOM + COM LOADING LBS/DAY	**Maximum Allowable Load MAL LBS/DAY**	**MAL is for**	POLLUTANT	If you are adopting a Commercial Limit, then these are the loadings from Table 5 lbs/day	Percentage of MAL to allocate to SIUs Only %	Percentage of MAL that will be allocated to Commercial Users %	MACL Calculated ALLOCATION FOR COMMERCIAL LBS/DAY	MAIL Calculated ALLOCATION FOR SIUs LBS/DAY	CALCULATED UNIFORM LOCAL LIMITS FOR SIUs MG/L	POLLUTANT
ARSENIC	0.4576575	0.4576575	WQ-CHRONIC	15	[illegible]	n	0.251091302	0.251091302	SIUs	ARSENIC		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	78.712	ARSENIC
CADMIUM	0.082919836	0.082919836	WQ-CHRONIC	15	[illegible]	n	0.063166803	0.063166803	SIUs	CADMIUM		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	19.801	CADMIUM
CHROMIUM - TOTAL	14.16634783	14.16634783	WQ-CHRONIC	15	[illegible]	n	11.95414922	11.95414922	SIUs	CHROMIUM - TOTAL		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	3747.362	CHROMIUM - TOTAL
CHROMIUM (III)	14.16634783	14.16634783	WQ-CHRONIC	15	12.04139566	n	11.95414922	11.95414922	SIUs	CHROMIUM (III)		100.0	n/a	0 Discharge due to SIU Allocation	11.95414922	3747.362	CHROMIUM (III)
CHROMIUM (VI)	1.751037391	[illegible]	WQ-CHRONIC	15	1.488381783	n	1.470094138	1.470094138	SIUs	CHROMIUM (VI)		100.0	n/a	0 Discharge due to SIU Allocation	1.470094138	460.842	CHROMIUM (VI)
COPPER	3.295134	[illegible]	NPDES Mo	15	2.8008629	n	0.007045996	0.007045996	SIUs	COPPER		100.0	n/a	0 Discharge due to SIU Allocation	0.007045996	2.209	COPPER
LEAD	[illegible]	1.0046674	Biosolids	15	[illegible]	n	0.766720874	0.766720874	SIUs	LEAD		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	240.350	LEAD
MERCURY	[illegible]	[illegible]	Biosolids	15	[illegible]	n	0.051130971	0.051130971	SIUs	MERCURY		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	16.028	MERCURY
MOLYBDENUM	[illegible]	0.769869714	Biosolids	15	[illegible]	n	0.931577209	0.931577209	SIUs	MOLYBDENUM		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	292.029	MOLYBDENUM
NICKEL	[illegible]	2.763959082	WQ-CHRONIC	15	[illegible]	n	1.997708169	1.997708169	SIUs	NICKEL		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	626.237	NICKEL
SELENIUM	0.215368235	0.215368235	WQ-CHRONIC	15	[illegible]	n	0.095816569	0.095816569	SIUs	SELENIUM		100.0	n/a	0 Discharge due to SIU Allocation	[illegible]	30.036	SELENIUM
SILVER	15.91852174	[illegible]	WQ-CHRONIC	15	13.53074348	n	13.51807569	13.51807569	SIUs	SILVER		100.0	n/a	0 Discharge due to SIU Allocation	13.51807569	4237.618	SILVER
ZINC	8.263986857	[illegible]	NPDES Month	15	7.024388829	n	0.863426555	0.863426555	SIUs	ZINC		100.0	n/a	0 Discharge due to SIU Allocation	0.863426555	270.665	ZINC

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TABLE 14: LOCAL LIMIT SUMMARY FOR DAILY AND MONTHLY LL	**DAILY MAXIUM LOCAL LIMIT INFORMATION**						**MONTHLY AVERAGE LOCAL LIMIT INFORMATION**					
POLLUTANT	MAIL FOR SIUs LBS/DAY	UNIFORM CONCENTRATION FOR SIUs (MG/L)	MACL FOR COMMERCIAL USERS (LBS/DAY)	PROPOSED DAILY MAX LIMIT	PROPOSED MACL FOR COMMERCIAL USERS	POLLUTANT	MAIL FOR SIUs LBS/DAY	UNIFORM CONCENTRATION FOR SIUs (MG/L)	MACL FOR COMMERCIAL USERS (LBS/DAY)	PROPOSED MONTHLY AVERAGE LIMIT	PROPOSED MACL FOR COMMERCIAL USERS	POLLUTANT
				mg/L						mg/L		
ARSENIC	0.2511	78.7116	n/a	52.47	n/a	ARSENIC	0.251091	78.711573	Discharge due to SIU Allocatio	52.47	n/a	ARSENIC
CADMIUM	0.1634	51.2182	n/a	[illegible]	n/a	CADMIUM	0.063167	19.801396	Discharge due to SIU Allocatio	13.20	n/a	CADMIUM
CHROMIUM - TOTAL	13.4435	4214.2391	n/a	[illegible]	n/a	CHROMIUM - TOTAL	11.954149	3747.361527	Discharge due to SIU Allocatio	2498.24	n/a	CHROMIUM - TOTAL
CHROMIUM (III)	13.4435	4214.2391	n/a	[illegible]	n/a	CHROMIUM (III)	11.954149	3747.361527	Discharge due to SIU Allocatio	2498.24	n/a	CHROMIUM (III)
CHROMIUM (VI)	2.1466	672.9215	n/a	448.61	n/a	CHROMIUM (VI)	1.470094	460.842015	Discharge due to SIU Allocatio	307.23	n/a	CHROMIUM (VI)
COPPER	1.2519	[illegible]	n/a	261.62	n/a	COPPER	0.007046	2.208764	Discharge due to SIU Allocatio	[illegible]	n/a	COPPER
LEAD	4.1145	[illegible]9.7953	n/a	859.86	n/a	LEAD	0.766721	240.350045	Discharge due to SIU Allocatio	[illegible]	n/a	LEAD
MERCURY	0.0094	2.9520	n/a	1.97	n/a	MERCURY	0.051131	16.028429	Discharge due to SIU Allocatio	[illegible]	n/a	MERCURY
MOLYBDENUM	3.1940	[illegible]	n/a	667.50	n/a	MOLYBDENUM	0.931577	292.028862	Discharge due to SIU Allocatio	194.69	n/a	MOLYBDENUM
NICKEL	[illegible]	6513.8913	n/a	4342.59	n/a	NICKEL	1.997708	626.237350	Discharge due to SIU Allocatio	417.49		NICKEL
SELENIUM	[illegible]	202.1950	n/a	134.80	n/a	SELENIUM	0.095817	[illegible]	Discharge due to SIU Allocatio	[illegible]	n/a	SELENIUM
SILVER	[illegible]	180.2019	n/a	120.13	n/a	SILVER	13.518076	[illegible]	Discharge due to SIU Allocatio	825.08	n/a	SILVER
ZINC	0.8634	[illegible]	n/a	180.44	n/a	ZINC	0.863427	[illegible]	Discharge due to SIU Allocatio	[illegible]	n/a	ZINC

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Section 8
Proposed Local Limits

8.1 Industrial Allocation Approach

The approach used for determining industrial allocation is as follows: EPA Region 8 Local Limits Spreadsheet was used to calculate maximum allowable headworks loadings (MAHL) which represent the maximum amount of pollutant which can enter the headworks from all sources (domestic, commercial, and industrial) and still meet applicable discharge limits. From this MAHL, the domestic and commercial portions are subtracted leaving a mass loading available to industrial users. The Maximum Allowable Industrial Loading (MAIL) is available to be divided between significant industrial users.

8.2 Maximum Allowable Headworks Loading (MAHL)

The Region 8 LL Spreadsheet Tables are included in Section 7 and summarized in the following tables. ~~There are no local, state, or federal criteria for molybdenum daily limits; therefore, no acute MAHL for molybdenum exists.~~

~~Table 8-1 Maximum Allowable Headworks Loading~~

~~Pollutant~~	**~~Acute MAHL~~** **~~Table 8, Columns G & H~~** **~~(Daily Limit)~~**		**~~Chronic MAHL~~** **~~Table 9, Columns H & I~~** **~~(Monthly Limit)~~**	
	~~MAHL (lb/day)~~	~~Most Stringent Criteria~~	~~MAHL (lb/day)~~	~~Most Stringent Criteria~~
~~Arsenic~~	~~0.45~~	~~WQ-ACUTE~~	~~0.45~~	~~WQ-CHRONIC~~
~~Cadmium~~	~~0.20~~	~~WQ-ACUTE~~	~~0.08~~	~~WQ-CHRONIC~~
~~Chromium~~	~~15.91~~	~~MCL[1]~~	~~14.16~~	~~WQ-CHRONIC~~
~~Chromium (III)~~	~~15.91~~	~~MCL[1]~~	~~14.16~~	~~WQ-CHRONIC~~
~~Chromium (VI)~~	~~2.54~~	~~WQ-ACUTE~~	~~1.75~~	~~WQ-CHRONIC~~
~~Copper~~	~~4.75~~	~~NPDES Daily~~	~~3.29~~	~~NPDES Monthly~~
~~Lead~~	~~4.94~~	~~MCL[1]~~	~~1.00~~	~~Biosolids~~
~~Mercury~~	~~0.01~~	~~WQ-ACUTE~~	~~0.06~~	~~Biosolids~~
~~Molybdenum~~	~~4.12~~	~~No Criteria~~	~~0.76~~	~~Biosolids~~
~~Nickel~~	~~24.86~~	~~WQ-ACUTE~~	~~2.76~~	~~WQ-CHRONIC~~
~~Selenium~~	~~0.86~~	~~WQ-ACUTE~~	~~0.21~~	~~WQ-CHRONIC~~
~~Silver~~	~~0.69~~	~~WQ-ACUTE~~	~~15.91~~	~~WQ-CHRONIC~~
~~Zinc~~	~~8.26~~	~~NPDES Daily~~	~~8.26~~	~~NPDES Permit~~
~~[1]Manually updated to reflect assumptions in Section 6.4.2.~~				

Table 8-1 on the following page replaces, in entirety, the Table 8-1 presented in the January 2019 submission (above). The table on the following page captures the updates to the uncontrollable sector data set explained in Section 6.4.5, updates Table 7 explained in

Section 6.4.7, updates to Table 12 Column F and L explained in Section 6.4.12, and updates to Table 13, Column F explained in Section 6.4.13.

Table 8-1 Maximum Allowable Headworks Loading

Pollutant	Acute MAHL Table 8, Columns G & H (Daily Limit)		Chronic MAHL Table 9, Columns H & I (Monthly Limit)	
	MAHL (lb/day)	Most Stringent Criteria	MAHL (lb/day)	Most Stringent Criteria
Arsenic	0.45	WQ-ACUTE	0.45	WQ-CHRONIC
Cadmium	0.25	WQ-ACUTE	0.10	WQ-CHRONIC
Chromium	8.78	WQ-ACUTE	8.78	HH
Chromium (III)	7.32	WQ-ACUTE	8.01	WQ-CHRONIC
Chromium (VI)	1.17	WQ-ACUTE	0.80	WQ-CHRONIC
Copper	5.11	NPDES Daily	3.54	NPDES Monthly
Lead	4.94	WQ-ACUTE	1.00	Biosolids
Mercury	0.01	WQ-ACUTE	0.06	Biosolids
Molybdenum	3.62	OTHER	1.15	Biosolids
Nickel	30.80	WQ-ACUTE	3.42	WQ-CHRONIC
Selenium	0.86	WQ-ACUTE	0.21	WQ-CHRONIC
Silver	1.06	WQ-ACUTE	15.91	WQ-CHRONIC
Zinc	8.26	NPDES Daily	8.26	NPDES Monthly

8.3 Maximum Allowable Industrial Loading (MAIL)

After the Maximum Allowable Headworks Loading (MAHL) is determined, a growth factor of safety is applied which represents all growth of residential, commercial, industrial, and hauled waste both as infill within the existing service area and expansion of the service area. The purpose of this growth factor of safety is to reserve headworks loading capacity for anticipated growth. The City of Helena does not anticipate growth by infill within the existing service area or expansion of the service area. ~~Therefore, the City of Helena believes that the minimum EPA recommended value of 10% is more than adequate to cover growth.~~ The City of Helena's actual WWTP influent flows have increased by less than 0.5% per year for more than 10 years. At this growth rate, it would take 20 years to realize 10% growth. ~~The City of Helena is choosing to assign an additional factor of safety of 5% for a total Safety/Expansion Factor % of 15 percent.~~

~~Next, the total loading from all domestic and commercial sources is subtracted from the MAHL to determine the loading which can be allocated to industrial users, the Maximum Allowable Industrial Load (MAIL).~~

~~Table 8-2 Acute (Daily) Maximum Allowable Headworks Loading~~

~~Pollutant~~	~~MAHL (lb/day) Table 12, Column D~~	~~MAHL with Safety Expansion Factor (lb/day) Table 12, Column G~~	~~MAHL minus DOM + COM Loading (lb/day) Table 12, Column I~~	~~MAIL (lb/day) Table 12, Column S~~
~~Arsenic~~	~~0.45~~	~~0.38~~	~~0.25~~	~~0.25~~
~~Cadmium~~	~~0.20~~	~~0.17~~	~~0.16~~	~~0.16~~
~~Chromium~~	~~15.91~~	~~13.53~~	~~13.44~~	~~13.44~~
~~Chromium (III)~~	~~15.91~~	~~13.53~~	~~13.44~~	~~13.44~~
~~Chromium (VI)~~	~~2.54~~	~~2.16~~	~~2.14~~	~~2.14~~
~~Copper~~	~~4.75~~	~~4.04~~	~~1.25~~	~~1.25~~
~~Lead~~	~~4.94~~	~~4.20~~	~~4.11~~	~~4.11~~
~~Mercury~~	~~0.01~~	~~0.009~~	~~0.009~~	~~0.009~~
~~Molybdenum~~	~~4.12~~	~~3.50~~	~~3.19~~	~~3.19~~
~~Nickel~~	~~24.86~~	~~21.13~~	~~20.77~~	~~20.77~~
~~Selenium~~	~~0.86~~	~~0.73~~	~~0.64~~	~~0.64~~
~~Silver~~	~~0.69~~	~~0.58~~	~~0.57~~	~~0.57~~
~~Zinc~~	~~8.26~~	~~7.02~~	~~0.86~~	~~0.86~~

Table 8-2 below replaces, in entirety, the Table 8-2 presented in the January 2019 submission (above). The table below captures updates to the uncontrollable sector data set explained in Section 6.4.5 and updates to Table 12, Column F and L explained in Section 6.4.12.

Pollutant	MAHL (lb/day) Table 12, Column D	MAHL with Safety Expansion Factor (lb/day) Table 12, Column G	MAHL minus DOM + COM Loading (lb/day) Table 12, Column I	MAL (lb/day) Table 12, Column M	MAIL (lb/day) Table 12, Column S
Arsenic	0.45	0.36	0.14	0.14	0.14
Cadmium	0.25	0.20	0.18	0.18	0.18
Chromium	8.78	0.87	0.76	0.76	0.76
Chromium (III)	7.32	0.73	0.64	0.64	0.64
Chromium (VI)	1.17	0.35	0.31	0.31	0.31
Copper	5.11	4.35	1.22	1.00	1.00
Lead	4.94	2.47	2.22	1.00	1.00
Mercury	0.01	0.009	0.0083	0.0083	0.0083
Molybdenum	3.62	1.08	0.83	0.83	0.83
Nickel	30.80	9.24	8.85	1.00	1.00
Selenium	0.86	0.68	0.61	0.61	0.61
Silver	1.06	0.32	0.31	0.31	0.31
Zinc	8.26	7.02	0.07	0.07	0.07

~~Table 8-3 Chronic (Monthly) Maximum Allowable Headworks Loading~~

~~Pollutant~~	~~MAHL (lb/day) Table 13, Column D~~	~~MAHL with Safety Expansion Factor (lb/day) Table 13, Column G~~	~~MAHL minus DOM + COM Loading (lb/day) Table 13, Column I~~	~~MAIL (lb/day) Table 13, Column Q~~
~~Arsenic~~	~~0.45~~	~~0.38~~	~~0.25~~	~~0.25~~
~~Cadmium~~	~~0.08~~	~~0.07~~	~~0.06~~	~~0.06~~
~~Chromium~~	~~14.16~~	~~12.04~~	~~11.95~~	~~11.95~~
~~Chromium (III)~~	~~14.16~~	~~12.04~~	~~11.95~~	~~11.95~~
~~Chromium (VI)~~	~~1.75~~	~~1.48~~	~~1.47~~	~~1.47~~
~~Copper~~	~~3.29~~	~~2.80~~	~~0.007~~	~~0.007~~
~~Lead~~	~~1.00~~	~~0.85~~	~~0.76~~	~~0.76~~
~~Mercury~~	~~0.06~~	~~0.05~~	~~0.05~~	~~0.05~~
~~Molybdenum~~	~~0.76~~	~~0.65~~	~~0.93~~	~~0.93~~
~~Nickel~~	~~2.76~~	~~2.34~~	~~1.99~~	~~1.99~~
~~Selenium~~	~~0.22~~	~~0.18~~	~~0.09~~	~~0.09~~
~~Silver~~	~~15.91~~	~~13.5~~	~~13.5~~	~~13.51~~
~~Zinc~~	~~8.26~~	~~7.02~~	~~0.86~~	~~0.86~~

Table 8-3 below replaces, in entirety, the Table 8-3 presented in the January 2019 submission (above). The table below captures updates to the uncontrollable sector data set explained in Section 6.4.5 and updates to Table 13, Column F explained in Section 6.4.13.

Table 8-3 Chronic (Monthly) Maximum Allowable Headworks Loading

Pollutant	MAHL (lb/day) Table 13, Column D	MAHL with Safety Expansion Factor (lb/day) Table 13, Column G	MAHL minus DOM + COM Loading (lb/day) Table 13, Column I	MAIL (lb/day) Table 13, Column Q
Arsenic	0.45	0.36	0.14	0.14
Cadmium	0.10	0.08	0.06	0.06
Chromium	8.78	0.87	0.76	0.76
Chromium (III)	8.01	0.80	0.71	0.71
Chromium (VI)	0.80	0.24	0.20	0.20
Copper	3.54	3.15	0.02	0.02
Lead	1.00	0.50	0.25	0.25
Mercury	0.06	0.04	0.04	0.04
Molybdenum	1.15	0.92	0.67	0.67
Nickel	3.42	1.02	0.64	0.64
Selenium	0.21	0.17	0.09	0.09
Silver	15.91	1.59	1.58	1.58
Zinc	8.26	7.02	0.07	0.07

~~Given the extremely small flows from the current SIUs, the MAIL allocated across existing SIU flows results in very large allowable uniform local limits as shown in Table 8-4.~~

~~Table 8-4 Maximum Allowable Industrial Loading~~

~~Pollutant~~	**~~Acute MAIL Table 12, Columns S & T (Daily Limit)~~**		**~~Chronic MAIL Table 13, Columns Q & R (Monthly Limit)~~**	
	~~MAIL (lb/day)~~	~~Uniform Local Limit (mg/L)~~	~~MAIL (lb/day)~~	~~Uniform Local Limit (mg/L)~~
~~Arsenic~~	~~0.25~~	~~78~~	~~0.25~~	~~78~~
~~Cadmium~~	~~0.16~~	~~51~~	~~0.06~~	~~19~~
~~Chromium~~	~~13.44~~	~~4,214~~	~~11.95~~	~~3,747~~
~~Chromium (III)~~	~~13.44~~	~~4,214~~	~~11.95~~	~~3,747~~
~~Chromium (VI)~~	~~2.14~~	~~672~~	~~1.47~~	~~460~~
~~Copper~~	~~1.25~~	~~392~~	~~0.007~~	~~2.20~~
~~Lead~~	~~4.11~~	~~1,289~~	~~0.76~~	~~240~~
~~Mercury~~	~~0.009~~	~~2.95~~	~~0.05~~	~~16~~
~~Molybdenum~~	~~3.19~~	~~1,001~~	~~0.93~~	~~292~~
~~Nickel~~	~~20.77~~	~~6,513~~	~~1.99~~	~~626~~
~~Selenium~~	~~0.64~~	~~202~~	~~0.09~~	~~30~~
~~Silver~~	~~0.57~~	~~180~~	~~13.51~~	~~4,238~~
~~Zinc~~	~~0.86~~	~~270~~	~~0.86~~	~~270~~

Table 8-4 below replaces, in entirety, the Table 8-4 presented in the January 2019 submission (previous page). The table below captures updates to the uncontrollable sector data set explained in Section 6.4.5 and updates previously noted in Tables 8-2 and 8-3.

Table 8-4 Maximum Allowable Industrial Loading

Pollutant	Acute MAIL Table 12, Columns S & T (Daily Limit)		Chronic MAIL Table 13, Columns Q & R (Monthly Limit)	
	MAIL (lb/day)	Uniform Local Limit (mg/L)	MAIL (lb/day)	Uniform Local Limit (mg/L)
Arsenic	0.14	0.67	0.14	0.67
Cadmium	0.18	0.89	0.06	0.30
Chromium	0.76	3.62	0.76	3.62
Chromium (III)	0.64	3.04	0.71	3.37
Chromium (VI)	0.31	1.48	0.20	0.96
Copper	1.00	4.71	0.02	0.13
Lead	1.00	4.71	0.25	1.22
Mercury	0.0083	0.039	0.04	0.22
Molybdenum	0.83	3.93	0.67	3.16
Nickel	1.00	4.71	0.64	3.02
Selenium	0.61	2.90	0.09	0.47
Silver	0.31	1.47	1.58	7.46
Zinc	0.07	0.33	0.07	0.33

8.4 Proposed Local Limits

~~Although the City is not anticipating any new SIUs, the City is choosing not to assign the entire MAIL to the existing industrial users. The City has allocated 2/3 of the MAIL to the existing industrial users. The resulting local limits for the existing users are shown in Table 8-5 below.~~

~~**Table 8-5 Proposed Local Limits**~~

~~**Pollutant**~~	~~**Daily Limit (mg/L)**~~	~~**Monthly Limit (mg/L)**~~
~~**Arsenic**~~	~~52.47~~	~~52.47~~
~~**Cadmium**~~	~~34.15~~	~~13.20~~
~~**Chromium**~~	~~2,809.49~~	~~2,498.24~~
~~**Chromium (III)**~~	~~2,809.49~~	~~2,498.24~~
~~**Chromium (VI)**~~	~~448.61~~	~~307.23~~
~~**Copper**~~	~~261.62~~	~~1.47~~
~~**Lead**~~	~~859.86~~	~~160.23~~
~~**Mercury**~~	~~1.97~~	~~10.69~~
~~**Molybdenum**~~	~~667.50~~	~~194.69~~
~~**Nickel**~~	~~4,342.59~~	~~417.49~~
~~**Selenium**~~	~~134.80~~	~~20.02~~
~~**Silver**~~	~~120.13~~	~~2,825.08~~
~~**Zinc**~~	~~180.44~~	~~180.44~~

Table 8-5 on the following page replaces, in entirety, the Table 8-5 presented in the January 2019 submission (above). Due to the more conservative assumptions to calculate local limits, the City will assign the calculated MAIL as the local limit. The City's conservative approach allows capacity for future Industrial Users. The documented assumptions result in a monthly concentration limit for copper that is likely not achievable for Industrial Users. Therefore, copper will be assigned a load-based limit.

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Table 8-5 Final Local Limits

Pollutant	Daily Limit (mg/L)	Monthly Limit (mg/L)
Arsenic	0.67	0.67
Cadmium	0.89	0.30
Chromium	3.62	3.62
Chromium (III)	3.04	3.37
Chromium (VI)	1.48	0.96
Copper	4.71	0.027 lb/day
Lead	4.71	1.22
Mercury	0.039	0.22
Molybdenum	3.93	3.16
Nickel	4.71	3.02
Selenium	2.90	0.46
Silver	1.47	7.46
Zinc	0.33	0.33

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