Draft Final - Local Limits Evaluation

South Platte Water Renewal Partners
2900 S. Platte River Drive
Englewood, Colorado 80110

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Submitted to EPA Region 8 for Review

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Acronyms/Abbreviations

ADRE	Average Daily Removal Efficiency
AHL	Allowable Headworks Loading
BCF	Bioconcentration Factor
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CFR	Code of Federal Regulations
CFS	Cubic feet per Second
CIU	Categorical Industrial User
COD	Chemical Oxygen Demand
DRE	Daily Removal Efficiency
EPA	United States Environmental Protection Agency
gpd	Gallons per Day
lbs/Day	Pounds per Day
MAHL	Maximum Allowable Headworks Loading
MAIL	Maximum Allowable Industrial Loading
MDL	Method Detection Limit
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MRE	Mean Removal Efficiency
NPDES	National Pollutant Discharge Elimination System
POC	Pollutant of Concern
POTW	Publicly Owned Treatment Works
RP	Reasonable Potential
SIU	Significant Industrial User
SPWRP	South Platte Water Renewal Partners (formerly Littleton/Englewood Wastewater Treatment Plant)
TBLL	Technically Based Local Limits
TSS	Total Suspended Solids

References

Code of Federal Regulations, 40 CFR Part 403.1 through 40 CFR Part 403.20

Code of Federal Regulations, 40 CFR Part 122 Appendix D, Tables II, III, IV, and V

USEPA Local Limits Development Guidance and Appendices, (July 2004)

USEPA - Region 8 Technically-Based Local Limits Development Strategy and Appendices, (April 11, 2003)

Authorization to Discharge Under the Colorado Discharge Permit System, Permit Number CO0032999 Issued to the Littleton/Englewood Wastewater Treatment Plant, Effective date December 1, 2017

Colorado Department of Public Health and Environment, Water Quality Control Commission Regulation No. 31, The Basic Standards And Methodologies For Surface Water

Colorado Department of Public Health and Environment, Water Quality Control Commission Regulation No. 38, Classifications and Numeric Standards For South Platte River Basin, Laramie River Basin Republican River Basin, Smoky Hill River Basin
EPA National Recommended Water Quality Criteria - Aquatic Life Criteria Table. (October 20, 2016)

EPA National Recommended Water Quality Criteria - Human Health Criteria Table. (July 29, 2016)

USEPA Technical Support Document for Water Quality-Based Toxics Control (1991)

Colorado Department of Public Health and Environment, Water Quality Control Division, Implementation Policy titled “Determination of the Requirement to Include Water Quality Standards-Based Limits in CDPS Permits Based on Reasonable Potential (November, 2013)

Code of Federal Regulations, 40 CFR Part 503

EPA "Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks", (June, 1989)

EPA “The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion”, (1996)

EPA ProUCL Version 5.1 User Guide (October, 2015)

EPA ProUCL Version 5.1 Technical Guide (October, 2015)

Local Limits Evaluation

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EXECUTIVE SUMMARY

The General Pretreatment Regulations per 40 CFR Part 403 require that every POTW develop and implement local limits to protect their treatment plant, sewage system, biosolids and receiving water from adverse impacts from industrial and commercial wastewater dischargers. Each POTW with an approved pretreatment program shall continue to develop these limits as necessary and effectively enforce such limits. EPA regulations require that POTWs must provide a written technical evaluation of the need to revise local limits following NPDES permit issuance or reissuance. Per the authorization to discharge under the Colorado Discharge Permit System, Permit CO003299, with effective date December 1, 2017, the technical evaluation shall be submitted to the Approval Authority within 12 months of the effective date of the permit. This technical evaluation has been conducted in accordance with EPA's "Local Limits Development Guidance" July 2004 and the USEPA - Region 8 "Technically-Based Local Limits Development Strategy" April 2003 including the associated appendices and the Region 8 Local Limits Spreadsheet.

All records of the monitoring data used in the development of these technically-based local limits, including sample custody, are on-file and available for review at the South Platte Water Renewal Partners. These records will be maintained on-file as long as the current local limits are in effect.

The development of this technically based local limits evaluation includes the following steps:

- Preliminary data collection
  - Plant characteristics including compliance history
  - Influent flows (domestic, non-domestic, SIUs, hauled wastes)
  - Sampling data (plant influent/effluent scans, domestic and commercial sampling, SIUs, hauled wastes, biosolids, and receiving stream)
  - Identification of addition required sampling
- Compilation of information
  - NPDES Permit limitations
  - Water Quality Standards
  - Sludge Quality Standards
- Preliminary identification of Pollutants of Concern (POC) from the preliminary data and compilation of information
- Calculation of plant removal efficiencies

- Calculation of Allowable Headworks Loading (AHL), Maximum Allowable Headworks Loadings (MAHL) and Maximum Allowable Industrial Loading (MAIL)
- Calculation of Uniform Local Limits
- Assessment of calculated Local Limits

In preparation for this technically-based study, SPWRP submitted a proposed Sampling Plan for EPA review on October 4, 2016. The plan contained an outline of current sampling practices conducted by SPWRP and identified additional monitoring of pollutant loading to determine potential Pollutants of concern (POCs). The EPA approved the Sampling Plan on December 13, 2016. SPWRP also submitted a proposed Pollutants of Concern report for EPA Review on January 5, 2018; this submittal provided information pertaining to the screening and evaluation of pollutants and proposed final determination of POCs to be included in the Local Limits evaluation. The EPA reviewed and agreed with the Pollutants of Concern Evaluation on February 5, 2018.

Based on EPA guidance, the following proposed local discharge limitations have been developed based on the Maximum Allowable Headworks Loading (MAHL), calculated in pounds per day, for each pollutant of concern. MAHLs estimate the maximum combined loadings that can be received at the POTW's headworks from all sources. A pollutants MAHL is determined by first calculating its Allowable Headworks Loading (AHL) for each environmental criterion; the most stringent AHL constitutes the MAHL. A safety factor is applied to protect the POTW from uncertainties in data. Region 8 requires a safety + growth factor of at least ten (10) percent. After the MAHL, adjusted with a safety factor, has been determined for each POC, the portion of the pollutant loading from non-controllable domestic sources and pollutant loading from commercial sources not operating under a discharge permit is subtracted leaving the Maximum Allowable Loading (MAL) available to Significant Industrial Users (SIUs). An additional growth allowance is applied to protect the POTW against growth and expansion of SIUs. Pollutant loading from hauled septic wastes is subtracted from the MAL adjusted with a safety factor to determine the Maximum Allowable Industrial Loading (MAIL). Reserve loading is subtracted from the MAIL to allow for loading from future SIUs. The MAIL less reserve loading is then converted to uniform pollutant concentrations and allocated to SIUs.

Current and Revised Legal Authority Language for Local Limits for both cities is provided in Attachment J.

Attachment K includes an attorney's statement confirming that the modified legal authority will:

- Allow the municipality to fully implement and enforce Pretreatment Standards and Requirements,
- Be processed and adopted by administrative procedures established in local laws and regulations and will include an opportunity for the public to participate,
- Assure the changes will be in compliance with state laws and established standards and requirements in the municipality's NPDES discharge permit.

The Table 1 lists the proposed Local Limits, MAHL, and MAIL applicable to SIUs discharging to the South Platte Water Renewal Partners.

Table 1: South Platte Water Renewal Partners Proposed Local Limits

Pollutant	Local Limit	Units	MAHL (lbs/day)	MAIL (lbs/day)
Arsenic (As)	**0.014** (5)	mg/L	0.5033	0.1347
Benzene	**0.14**	mg/L	1.6957	1.3735
BTEX (2)	**0.75** (6)	mg/L	N/A	N/A
Cadmium (Cd) (1)	**0.22**	mg/L	2.8396	2.1772
Chromium (Cr)(3)	**5.37**	mg/L	65.6080	52.3282
Copper (Cu) (1)	**3.42**	mg/L	65.9181	33.2969
Cyanide (4)	**0.31**	mg/L	4.1741	3.0603
Hexavalent Chromium (Cr VI) (1)	**1.97**	mg/L	24.4467	19.1578
Lead (Pb) (1)	**2.90**	mg/L	39.1292	28.2708
Mercury (Hg) (1)	**0.001**	mg/L	0.0289	0.0095
Molybdenum (Mo) (1)	**5.69**	mg/L	70.9986	55.3826
Nickel (Ni) (1)	**3.76**	mg/L	48.3418	36.5936
Selenium (Se) (1)	**0.24**	mg/L	3.3980	2.3066
Silver (Ag) (1)	**0.68**	mg/L	8.5060	6.6149
Zinc (Zn) (1)	**34.35**	mg/L	470.3177	334.4315

(1) Local Limit developed for Total metal concentration based on the more stringent of Dissolved or Total standards.
(2) This is the sum of measured concentrations for Benzene, Toluene, Ethylbenzene, and Xylene
(3) Local Limit developed based on Chromium III standards
(4) Local limit developed based on Free Cyanide standards
(5) Local Limits for Arsenic based on current conditions, see section 8.3
(6) Technology based Local Limit established for BTEX, see section 12.0

1.0 INTRODUCTION

South Platte Water Renewal Partners (SPWRP) (formerly Littleton/Englewood Wastewater Treatment Plant) is located at 2900 South Platte River Drive, Englewood, Colorado 80110. Jointly owned and operated by the Cities of Littleton and Englewood, SPWRP was commissioned in April 1977. To meet new regulatory requirements for water quality, this regional facility was designed to replace two, aging treatment plants which had been in operation since the 1950s. SPWRP was expanded to the current design capacity in 2008 (Phase 2 Construction Project). Funded by sewer fees, SPWRP provides wastewater treatment to approximately 300,000 residential, business, and industrial customers within the Cities of Littleton and Englewood and 19 connecting sanitation districts, in a service area covering approximately 108 square miles. The service area covers portions of Jefferson, Arapahoe and Douglas Counties in the southwest Denver metropolitan areas.

SPWRP is a permitted facility regulated by the Colorado Department of Public Health and Environment (CDPHE) and Water Quality Control Division (WQCD).

SPWRP is authorized to discharge under Colorado Discharge Permit System (CDPS) Permit CO0032999. This permit became effective on December 1, 2017. Under the current CDPS permit, the SPWRP is rated at a hydraulic capacity of 50 million gallons per day (mgd) and treated effluent is permitted for discharge to the South Platte River Stream Segment 14 (COSPUS14). Segment 14 of the South Platte River is classified for the following uses:

- Recreation Class E
- Aquatic Life, Warm Water, Class 1
- Water Supply
- Agriculture

Biosolids produced at SPWRP is recycled as a fertilizer and soil amendment and land applied per EPA Biosolids Permit Number COG-650019. Utilizing farm land jointly owned by the Cities, biosolids are beneficially applied to the fields using an effective management program, which allows safe reuse without environmental damage.

The purpose and goals of an Industrial Pretreatment Program are:

- To prevent the introduction of pollutants into the Publicly-Owned Treatment Works (POTW) that will interfere with the operation of the system or contaminate the resulting sludge;
- To prevent the introduction of pollutants into the POTW which will pass through the system, inadequately treated, into receiving waters or the atmosphere or otherwise be incompatible with the system;
- To improve the opportunity to recycle and reclaim wastewaters and sludges from the system;
- To provide for equitable distribution among users of the cost of the POTW;
- To provide for and promote the general health, safety and welfare of the citizens residing within the City and connecting jurisdictions;
- To enable the City to comply with its Colorado Discharge Permit System (CDPS) permit conditions, sludge use and disposal requirements, and any other Federal or State laws to which the POTW is subject; and
- To prevent adverse impacts to worker health and safety due to the discharge of pollutants from industrial users.

These goals are accomplished through administering:

- National Categorical Standards (industry-specific effluent limits)
- Prohibited Discharge Standards (general and specific prohibitions)
- Enforceable Technically Based Local Limits (TBLLs)

The development and adoption of TBLLs based on site specific conditions protects the treatment plant, collection system, biosolids, and receiving stream from adverse impacts from industrial and commercial dischargers.

The development of the proposed TBLLs have been based on site conditions, sampling data collected over the previous four years, current regulations pertaining to water quality and biosolids standards, and the best professional judgement of SPWRP.

2.0 FACILITY DESCRIPTION

2.1 Plant Schematic

The following schematic provides an overview of the SPWRP processes and equipment

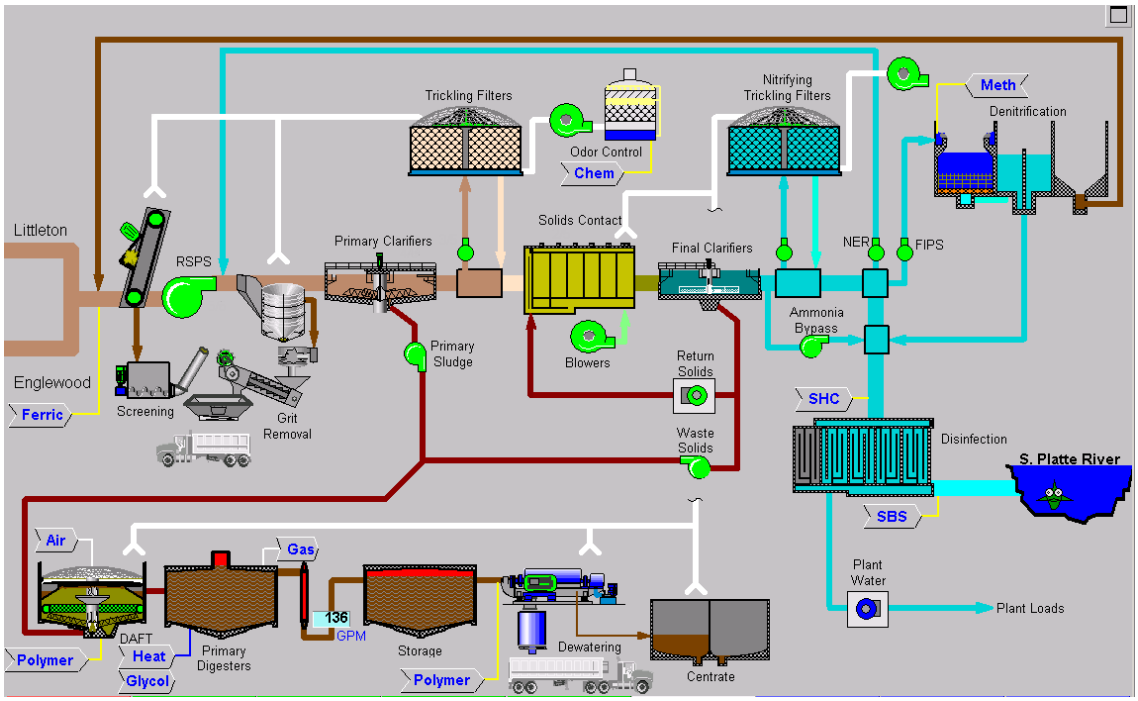

Figure 1: South Platte Water Renewal Partners Processes and Equipment Schematic

2.2 Process Descriptions

South Platte Water Renewal Partners is a 50.0 MGD design capacity wastewater treatment facility currently treating approximately 21.0 MGD. The plant serves the cities of Littleton, Englewood and other surrounding communities. The facility treats raw wastewater through physical and biological processes. Treatment processes include:

Headworks-- Raw sewage enters the plant treatment process at the headworks influent, where the Englewood and Littleton interceptors discharge untreated sewage into the influent structure. The flowrate from each interceptor is measured in Parshall flumes as it enters the influent structure.

Primary--Primary Treatment is the gravity removal of settleable and floatable suspended solids from the influent wastewater so organic loading to downstream processes is essentially soluble.

Trickling Filter--Trickling Filters (TFs) are fixed-film biological processes that convert soluble BOD5 and colloidal material in the primary clarifier effluent into TF humus (biomass), reducing BOD5 loading to downstream processes

Secondary--Secondary Treatment consists of RA/SCT system, Aeration blowers, Diffused air systems, RSS system, WSS system, Tank drain system, Foam control system, Final clarifiers

Nitrifying Trickling Filter-- The nitrogen removal process at the facility involves two biological reactions that occur in separate parts of the plant. Nitrification is the reaction that oxidizes ammonia-nitrogen to nitrate-nitrogen in the presence of free dissolved oxygen. This is known as an aerobic environment.

Dewatering--The dewatering building houses the equipment for polymer addition to both the DAFT units and the Sludge Dewatering Centrifuges. Dewatered biosolids are taken to agricultural application sites in a beneficial reuse program.

Dissolved Air Flotation-- Dissolved Air Flotation Thickeners (DAFT) are the unit process by which the suspended solids concentration of Primary Sludge and Scum (PS/PSC) and Waste Secondary Sludge (WSS) is increased. This results in a more concentrated sludge feed to the digesters, increasing residence time and enhancing volatile solids destruction.

Digestion Treatment/ Anaerobic-- The purpose of the digesters is to stabilize and reduce the volume of solid residuals from the wastewater treatment processes. This process also generates biogas (predominately methane and carbon dioxide) used for process heating requirements. Excess gas produced is flared to atmosphere.

Centrate-- The function of the centrate storage and pumping system is to store centrate from dewatering operations and pump the centrate to the Trickling Filter Pump Station following a centrate management plan. This plan is followed to better manage ammonia loading to the plant process.

Disinfection-- The final unit process is Disinfection, where the disinfectant, chlorine (as sodium hypochlorite, SHC) is applied to the plant effluent to destroy or inactivate pathogenic organisms. Chlorine residual cannot be discharged to the environment because of its toxicity to aquatic organisms. Therefore, immediately prior to discharge to the South Platte River, the plant effluent is dechlorinated using sodium bisulfite (SBS). The final element of the Disinfection unit process is the 3W Pump Station, which distributes 3W throughout the facility for irrigation, pump seal water and process needs.

Denitrification-- The nitrate-nitrogen is converted to nitrogen gas through a biological reaction known as denitrification. This takes place in the absence of dissolved oxygen and the presence of a readily biodegradable carbon source (methanol). This is known as an anoxic environment.

2.3 Service Area

The following Map provides an overview of the SPWRP Service Area

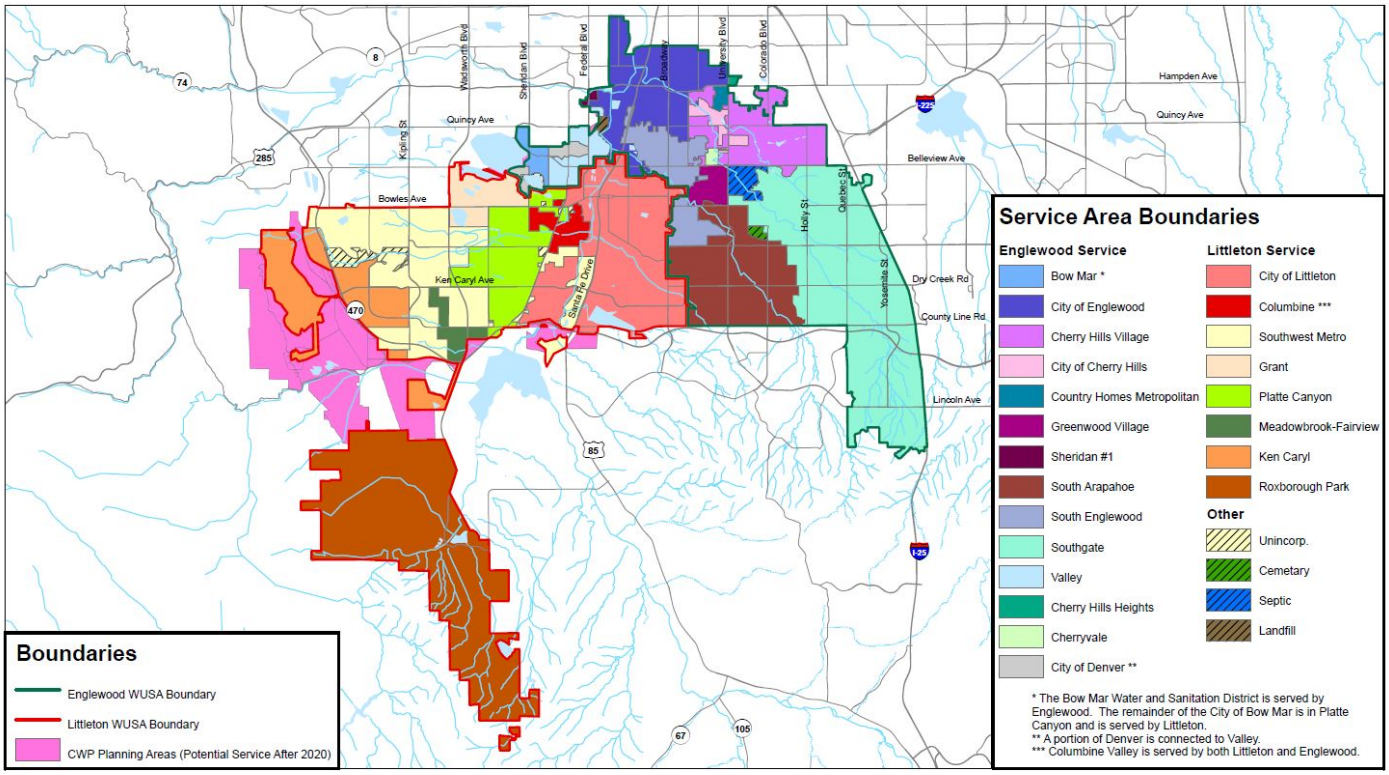

Figure 2: South Platte Water Renewal Partners Service Area

3.0 SAMPLING PLAN

A formal sampling plan was submitted to USEPA Region 8 for review on October 4, 2016. The EPA approved the Sampling Plan on December 13, 2016.

3.1 Influent and Effluent Sampling

Per permit requirements; SPWRP must analyze the treatment plant influent and effluent for the presence of the toxic pollutants listed in 40 CFR Part 122, Appendix D, Table II at least two (2) times per year and pollutants listed in Table III at least four (4) times per year. If based upon information available, there is reason to suspect the presence of any toxic or hazardous pollutant listed in Table V, analysis for these pollutants shall be performed at least four (4) times per year on both the influent and effluent.

SPWRP monitors Table II pollutants four (4) times per year, Table III pollutants four (4) times per year, and Table V (Xylene only) four (4) times per year.

SPWRP also monitors plant influent and effluent for numerous pollutants on a daily or weekly basis to meet permit requirements and to obtain additional information. A comprehensive listing of sampling results was provided in the Pollutants of Concern Evaluation and formed the basis for final determination of POCs to be included in the Local Limits evaluation.

A listing of the parameters in which analysis provided a result at or above the Method Detection Limit (MDL) in the plant's influent or effluent from January 1, 2013 through the 3rd quarter of 2017 has been compiled and is provided in Attachment A.

3.2 Hauled Wastes Sampling

SPWRP receives Trucked and Hauled Septage by permit only. Acceptable wastes include portable toilet waste, chemical toilets, and septic tank waste. Septage is sampled monthly by random selection of waste deliveries. Septage is monitored for Arsenic, BOD, Cadmium, Chromium, COD, Copper, Lead, Mercury, Molybdenum, Nickel, Oil and Grease, Phosphorus, Selenium, Silver, TSS, and Zinc. Compiled Trucked and Hauled Septage sampling results from January 1, 2014 through September 30, 2017 is provided in Attachment B.

3.3 Biosolids Sampling

SPWRP produced Class "B" Biosolids which are used in an agricultural land application program. Per permit requirements; SPWRP must analyze biosolids prior to disposal for the presence of toxic pollutants listed in 40 CFR Part 122, Appendix D, Table III at least once per year.

SPWRP monitors the Biosolids for the 15 listed pollutants in Table III along with Aluminum, Barium, Iron, Manganese, Molybdenum, Potassium, Phosphorus, and Total Nitrogen (Kjeldahl) monthly.

Per permit requirements; SPWRP must review influent sampling results for pollutants listed in 40 CFR Part 122, Appendix D, Tables II and V. If any pollutants in these tables have been reported above detection the POTW must sample and analyze the biosolids for these pollutants at least once per year. SPWRP performs Biosolids samples for Table II pollutants once per year. Biosolids sampling results from January 1, 2013 through September 30, 2017 is provided in Attachment C.

3.4 Significant Industrial User Sampling

Per 40 CFR Part 403 requirements; Significant Industrial Users (SIUs) must have their effluent sampled at least once per year.

SPWRP typically performs authority monitoring sampling at all discharging SIUs twice per year.

Per 40 CFR Part 403 requirements; SIUs subject to categorical Pretreatment Standards and SIUs not subject to categorical Pretreatment Standards must submit to the control authority, twice per year, a report indicating the nature and concentration of pollutants in their effluent.

SPWRP requires all discharging SIUs to perform, at a minimum quarterly, self-monitoring sampling and report all sampling results four (4) times per year. See Table 2 for SIU Sampling frequency. Attachment D provides the average and maximum pollutant concentrations from Significant Industrial users based on sampling data from January 1, 2013 through September 30, 2017.

Table 2: Significant Industrial User Sampling

Permitted SIU	Permit #	Description	Self-Monitoring Frequency
Meadow Gold Dairies	88-04	SIU	Monthly
Service Uniform	88-11	SIU	Monthly
Viasystems Denver, Inc.	00-02	CIU	Quarterly
Karcher North America	02-02	CIU	Quarterly
Unicircuit, Inc.	99-01	CIU	Monthly
Pioneer Metal Finishing	13-01	CIU	Quarterly
Preferred Medical Products	97-03	CIU	Quarterly
Breckenridge Brewery	15-01	SIU	Monthly
Premier Coatings, LLC.	14-01	CIU	Quarterly
Raritan CWT	07-01	CIU	Quarterly
Lockheed Martin Space Systems	07-02	CIU	Quarterly
Mile High Powder Coating	17-01	CIU	Quarterly
Closed County Line Landfill	17-02	SIU	Quarterly

3.5 Commercial and Domestic Sampling

EPA Local Limits Development Guidance, recommends that POTWs base their local discharge limitations on maximum allowable headworks loading (MAHL) for each pollutant of concern. To determine maximum allowable industrial loading, the POTW must determine pollutant loadings from controllable (commercial) sources and non-controllable (domestic) sources. Domestic/residential sources can contribute significant pollutant loading and can therefore have a profound effect on the allowable pollutant loadings from controllable permitted sources.

To determine the relative contributions of non-controllable versus controllable sources; SPWRP has established a sampling program consisting of four (4) sampling locations in the service area collection system. Two sampling locations (8602-003 and 8602-004) are representative of residential (non-controllable) pollutant loading and two locations (8603-003 and 8603-004) are representative of commercial/industrial pollutant loadings. See Figure below for locations.

All four locations are sampled on the same day on a quarterly basis. Each location is sampled for metals (As, Cd, Cr, Cr+6, CU, Pb, Hg, Mo, Ni, Se, Ag, Zn), Cyanide, Phosphorus. Conventional pollutants including BOD, COD, and TSS sampling has occurred on a periodic basis.

Through initial influent/effluent data scans, SPWRP identified several potential pollutant of concern that required further evaluation during the technically-based local limits study. Additional sampling and analysis was conducted for Total Phenols, Oil and Grease, and the toxic pollutants listed in 40 CFR Part 122, Appendix D, Table II. Commercial and Residential sampling results from January 1, 2013 through September 30, 2017 are provided in Attachment E.

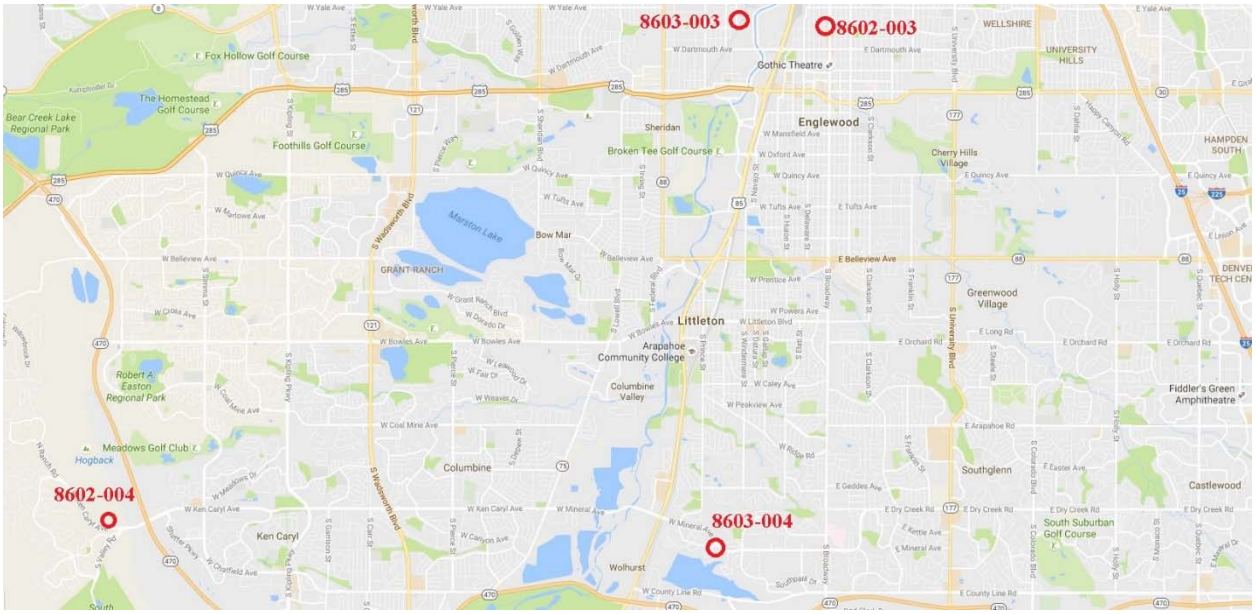

Figure 3: Commercial and Residential Sampling Locations

3.6 Receiving Stream Sampling

SPWRP has collected upstream background pollutant concentrations to determine ambient water quality. Sampling was performed at a permitted location approximately ½ mile upstream from the POTW. The SPWRP performs sampling for numerous parameters upstream of the plant's discharge point. This data is provided to the Colorado Data Sharing Network (CDSN). Receiving Stream sampling results from January 1, 2014 through September 30, 2017 are provided in Attachment F.

4.0 ANALYTICAL METHODS

All sampling data collection and analysis including hold times and sample preservation has been performed in accordance with the procedures established in 40 CFR Part 136 and 40 CFR Part 503. Tables 3 and 4 provide the analytical testing and collection methods used during sampling data collection.

Table 3: Analytical Methods - Wastewater
40 CFR Part 136

Parameter	Collection Method	Analytical Testing Method
Metals, Total	Composite/Grab*	EPA 200.8
Mercury	Composite/Grab*	EPA 245.1
Phosphorus, Total	Composite/Grab*	HACH8190/SM4500P-B/E
Cyanide, Total	Grab	EPA 335.4/SW9012
Cyanide, WAD	Grab	SM4500CN
Hexavalent Chromium	Grab	SM3500-Cr B
Phenols, Total	Grab	EPA 420.4
Biological Oxygen Demand (BOD)	Composite/Grab*	SM 5210B

Chemical Oxygen Demand (COD)	Composite/Grab*	SM 5220D
Total Suspended Solids (TSS)	Composite/Grab*	SM2540D
Volatile Organics	Lab Composite	EPA 624
Semi-volatile Organics	Composite	EPA 625
Pesticides/PCBs	Composite	EPA 608
PCBs	Composite	SW-846-8082

* Composite/grab sample collection method per discharging permit requirements or approved sampling methods.

Table 4: Analytical Methods - Sludge and Biosolids

40 CFR Part 503.8

Parameter	Collection Method	Analytical Testing Method
Metals, Total	Composite	SW-846-6020
Mercury	Composite	SW-846-7471
Phosphorus, Total	Composite	SM-4500 PC
Cyanide, Total	Composite	SW-846-9010
Iron, Total	Composite	SW-846-7000b
Potassium, Total	Composite	SW-846-7000b
Phenols, Total	Composite	SW-846-9065
Volatile Organics	Composite	SW-846-8260C
Semi-volatile Organics	Composite	SW-846-8270C
Pesticides	Composite	SW-846-8081A
PCBs	Composite	SW-846-8082

5.0 DETERMINATION OF FLOW VOLUMES

5.1 SPWRP Influent Flow

Based on plant influent flow recorded data from 2013 through 2016, the average monthly influent flow is 21.94 mgd. The highest monthly flow observed during this time period was 28.7 mgd (May, 2015). Per the SPWRP Master Plan, October 2013, prepared by Brown and Caldwell; SPWRP should anticipate a maximum monthly influent increase of 2.0 mgd by the year 2020 due to anticipated population growth in the service area, resulting in a projected maximum monthly wastewater flow of 30.7 mgd. An Infiltration/Inflow Study was prepared by Camp Dresser & McKee Inc. (CDM), May 13, 2011, the study results indicate Infiltration and Inflow is not considered excessive for any of the monitoring sewer sheds within the service area. Table 5 provides the SPWRP Influent flow volumes from 2013 – 2016.

Table 5: SPWRP Influent Flow Volumes

	2013	2014	2015	2016
MONTHLY AVERAGE				
January	20.25	21.60	21.30	20.30
February	19.95	20.96	21.40	21.40
March	20.45	20.95	22.10	21.90
April	20.90	21.03	23.20	25.20
May	21.60	22.45	28.70	25.40
June	21.11	21.68	28.10	23.10
July	20.96	21.64	24.20	22.20
August	21.50	22.32	22.90	21.60
September	22.60	21.51	21.40	20.90
October	21.29	21.65	21.40	20.50
November	20.85	21.39	22.10	20.70
December	21.70	21.10	20.80	21.00
Yearly Average	**21.10**	**21.52**	**23.13**	**22.02**
Yearly Maximum Month	**22.60**	**22.45**	**28.70**	**25.40**

5.2 Hauled Wastes

SPWRP calculates hauled septage volumes received at the plants septic receiving station based on pre-recorded truck capacities and completed receiving station receipts. Access to the receiving station is controlled by permit issued gate cards. Based on January 1, 2014 through September 30, 2017 receiving station records, the maximum daily flow volume received was 0.0451 mgd (September 2016).

5.3 Significant Industrial User Flow

Industrial Wastewater Discharge Permits issued by SPWRP to SIUs include the requirement to monitor, record, and report discharge volumes. Discharge volumes have been calculated using data from January 1, 2015 through September 30, 2017. Table 6 provides the daily maximum discharge and the daily discharge average from SIUs.

Table 6: SIU Discharge Volumes

Industry	Maximum Daily Discharge (gpd)	Average Daily Discharge (gpd)
Meadow Gold Dairies	200,858	81,465
Service Uniform	76,585	37,555
Viasystems Denver, Inc.	56,220	31,787
Karcher North America	3,560	1,644
Unicircuit Inc.	55,847	33,768
Pioneer Metal Finishing	1,350	1,037
Preferred Medical Products, Inc	1,693	789
Breckenridge Brewery	287,139	30,271
Premier Coatings LLC	760	463

Raritan CWT	2,3052	9,044
Lockheed Martin Space Systems	333,175	91,462
Mile High Powder Coating	2,370	942
Closed County Line Landfill	8,051	7,752
Totals:	**1,050,660**	**327,979**

5.4 Domestic and Commercial Flow

Water consumption data was used as a basis for determining the percentage of total wastewater flow from residential (domestic) sources versus commercial sources. Water consumption data, defined as residential or commercial accounts, was collected from the City of Englewood Utilities Department and Denver Water for the “Dry” months (October through April) of 2016. Dry month data were used to minimize the contribution of water for land application. The data collected provided a sound estimate of the percentage of total plant influent from domestic sources (65%) and commercial sources (35%). As provided in section 5.1 the projected maximum monthly wastewater flow to SPWRP is 30.7 mgd. Subtracting out the contribution from hauled wastes and SIUs results in a calculated contribution of 29.6 mgd from uncontrolled sources. Using the estimated percentages of commercial versus domestic contributions results in a calculated contribution of 19.24 mgd from domestic sources and 10.36 mgd from commercial sources.

5.5 Sludge Flow to Disposal

SPWRP records flow volumes as sludge exits the secondary digesters and enters the scroll centrifuges which are used for final dewatering of the sludge prior to disposal. Based on plant data from 2013 – 2016 the average sludge flow to disposal was 0.142 mgd. Based on daily laboratory analysis of the hauled biosolids cake during this time period, the average percentage of solids (% solids to disposal) was 18.4%. Using methods provided in the Local Limits Development Guidance Appendices, the specific gravity of sludge to disposal was calculated to be is 1.06 kg/L.

5.6 Receiving Stream Flows

Colorado Regulations specify the use of low flow conditions when establishing water quality based effluent limitations. Acute low flow (1E3) represents the one day low flow recurring in a three year interval. Chronic low flow (30E3) represents the 30 day average low flow recurring in a three year interval. Acute and chronic low flow conditions for the South Platte River, stream segment 14 were provided to SPWRP by CDPHE in the Water Quality Assessment (Appendix to the SPWRP Discharge Permit). Per the Water quality Assessment, Acute low flow is 16 cfs (10.34 mgd) and the Chronic low flow is 24 cfs (15.51 mgd).

6.0 POLLUTANTS OF CONCERN

SPWRP submitted a proposed Pollutants of Concern Evaluation for EPA Review on January 5, 2018. This submittal provided information pertaining to the screening and evaluation of pollutants and proposed final determination of POCs to be included in the Local Limits evaluation. The EPA reviewed and agreed with the Pollutants of Concern Evaluation on February 5, 2018.

Pollutants of Concern (POC) are pollutants that must be carried through the local limits evaluation. A POC is any pollutant that might reasonably be expected to be discharged to the POTW in sufficient amounts to cause pass through or interference, cause problems in its collection system, cause operational problems, or jeopardize its workers.

USEPA Region 8 Technically-Based Local Limits Development Strategy identifies POCs as any pollutants falling into the following categories:

1. National POCs - Arsenic, cadmium, copper, cyanide, lead, mercury, molybdenum, nickel, selenium, silver, and zinc; AND
   - Chromium (total) and Chromium (VI), OR Chromium (VI) and Chromium (III)
2. Any pollutant listed in your State Water Quality Standards for your receiving water or are listed in your NPDES permit;
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;
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 Bioconcentration Factor (BCF) of 300 or greater;
5. Any other pollutant not covered by category 3 or 4, that is determined to be present at 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;
6. Any pollutant with a current average influent (headworks) loading greater than 70% of the POTW design loading.
7. Any pollutant identified through WET characterization studies as being present and suspected or responsible for toxicity.
8. Any pollutant identified in biosolids analytical results which is not a pollutant that would be expected or is at a concentration that would be considered atypical;
9. Any other pollutant specifically designated by the POTW Pretreatment Program and/or Approval Authority as a pollutant of concern.

EPA recommends that any pollutant that has a “reasonable potential” to be discharged in amounts that could exceed water quality standards or criteria should be considered a POC and evaluated accordingly.

To further identify pollutants of concern, SPWRP performed quantitative statistical analyses to determine if a Reasonable Potential (RP) exists to violate a state water quality standard or permit limit. The RP evaluation was based upon EPA’s guidance for establishing reasonable potential as found in Chapter 3 of the Technical Support Document for Water Quality-based Toxics Control (USEPA 1991). SPWRP also referenced Colorado Department of Public Health and Environment Water Quality Control Division Implementation Policy titled Determination of the Requirement to Include Water Quality Standards-Based Limits in CDPS Permits Based on Reasonable Potential in the RP analysis. With the exception of Endosulfan-I, the Pollutants of Concern identified in Table 7 have been carried through the Local Limits Evaluation.

Table 7: Pollutants of Concern

Pollutant	Comments
Arsenic (As)	Existing Local Limit / National POC
Benzene	Existing Local Limit (1)
BTEX	Existing Local Limit (1)
Cadmium (Cd)	Existing Local Limit / National POC
Chromium (Cr)	Existing Local Limit / National POC
Copper (Cu)	Existing Local Limit / National POC
Cyanide (CN)	Reasonable Potential to Exceed Environmental Criteria
Endosulfan-I	Reasonable Potential to Exceed Environmental Criteria
Hexavalent Chromium (Cr VI)	Existing Local Limit / National POC
Lead (Pb)	Existing Local Limit / National POC
Mercury (Hg)	Existing Local Limit / National POC
Molybdenum (Mo)	Existing Local Limit / National POC
Nickel (Ni)	Existing Local Limit / National POC
Selenium (Se)	Existing Local Limit / National POC
Silver (Ag)	Existing Local Limit / National POC
Zinc (Zn)	Existing Local Limit / National POC

(1) Existing Local Limits is technically-based established on treatment technology per EPA guidance

Reasonable potential analysis identified Endosulfan-I as a potential pollutant of concern. As provided in Attachment A, Endosulfan-I was detected above the method detection limit in four of nineteen influent sampling events with an average concentration of 0.000037 mg/L and maximum concentration of 0.000055 mg/L. Endosulfan-I was also detected above the method detection limit in eight of nineteen effluent sampling events with an average concentration of 0.000031 mg/L and maximum concentration of 0.000059 mg/L. As provided in Attachment C, Endosulfan-I has not been detected in Biosolids sampling events. Research indicates that the primary source of Endosulfan-I in industrial wastewater discharge is from facilities that formulate, package, and repackage pesticides. These types of industries are subject to

regulation under 40 CFR part 455 Subpart C – Pesticide Chemicals Formulating and Packaging Subcategory. There are no known industries in the SPWRP service area that meet this Categorical definition. A review of sampling data of the significant industrial users in the service area shows that since 2009, one permitted industry had an Endosulfan-I detection above the method detection limit. As provided in Attachment E, wastewater samples collected throughout the service area at locations comprised primarily of either commercial or residential sources resulted in non-detections for Endosulfan-I in all samples. Due to the inability to determine the loading from controllable (commercial) sources and the loading from non-controllable (residential) sources (an essential step in determining the maximum allowable industrial loading), Endosulfan-I has been has been removed from further headworks analysis and Local Limit determination. SPWRP will continue to monitor for Endosulfan-I during permit required influent and effluent sampling events, investigate further through a review of the Industrial User inventory, inspections, and increased sampling to determine potential sources of Endosulfan-I. Additional sampling locations will include the residential and commercial local limits sampling locations on a semi-annual basis and the sampling of the septic receiving station on a quarterly basis.

7.0 MINIMUM DETECTION LEVELS AND BELOW DETECTION LEVELS

Environmental data sets frequently contain values that are below analytical detection methods. In the TBLL evaluation, SPWRP is following the EPA conservative position that a pollutant is present in some concentration even if the analysis provides a non-detection. Method Detection Limit (MDL) is an estimate of the minimum amount of a substance that an analyte process can reliably detect. An MDL is analyte specific and laboratory dependent. An MDL is often defined as the minimum concentration that can be measured with 99% confidence that the analyte concentration is greater than zero.

The USEPA-Region 8 Technically-Based Local Limits Development Strategy provides guidance for handling data measured at below detection limits. SPWRP used a conservative approach for managing sampling data results below detection limits. In these cases, one-half (1/2) the MDL as provided by the Certified Laboratory has been used in this evaluation. The substitution of ½ the MDL is an allowable alternative per EPA guidance.

8.0 ENVIRONMENTAL CRITERIA

8.1 Acute Water Quality Criteria

Attachment G provides limitations or standards to address acute risk (short term effects such as survival and growth) for the protection of aquatic life or how much chemical can be present in surface water before it is likely to harm plant and animal life.

8.2 Chronic Water Quality Criteria

Attachment H provides limitations or standards to address chronic risk (longer term effects such as reproduction) for the protection of aquatic life or human health or how much of a specific chemical can be present in surface water before it is likely to aquatic life or harm human health.

8.3 Limitation Established for Arsenic

Per SPWRP authorization to discharge under the Colorado Discharge Permit System, Permit CO0032999, with effective date December 31, 2017, and CDPHE Regulation No. 38 - Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin, a temporary modification for chronic Arsenic has been applied to the receiving stream. The temporary modification was established by the State to allow for a temporarily less stringent application of the chronic arsenic standard in control requirements for both existing discharges and new or increased discharges. For discharges existing on or before 6/1/2013, the temporary modification adopted for chronic arsenic is “current condition”.

Per CDPHE Regulation No. 38 “Maintaining the current condition will include maintaining permitted total arsenic loading to a treatment facility from arsenic contributors at the levels existing on the effective date of the temporary modification, while expressly allowing for variability in such loading due to changes in effluent quality as described above and due to changes in the influent flow and concentration over time within the permitted design flow of that facility”.

Per EPA recommendations and clarification, “Current Conditions” shall be defined as the SPWRP current influent loading. The current loading establishes the Maximum Allowable Headworks Loading or the maximum combined loadings that can be received at the SPWRP headworks from all sources. The established MAHL will be used in in the calculated the Maximum Allowable Industrial Loading (MAIL) and developed uniform pollutant concentrations and allocation to SIUs.

The equation used to determine the MAHL for Arsenic using average influent concentration per Attachment A and maximum plant influent flow rate per section 5.1:

$$MAHL = 0.0019657 \text{ mg/L} \times 30.7 \text{ mgd} \times 8.34$$

Based on influent sampling data for Arsenic and influent flow volumes, the maximum allowable headworks loading or combined loadings deemed ‘current conditions” has been calculated as 0.5033 lbs/Day.

8.4 Metals Translator

Water Quality Standards for some metals are expressed in the dissolved form. Most metals measurements, however, are reported in the total or total recoverable form. Total and total recoverable metals concentrations are always at least as high as dissolved metals concentrations because a fraction of the metal has sorbed to particulate matter in the water. Per EPA Local limits Development Guidance (2004), if dissolved metals Water Quality Standards or Water Quality Criteria are used to develop local limits that are expressed as total metals, local limits will be more stringent than if total metals concentrations are used for the WQS. Therefore, POTWs should convert dissolved metals WQS or WQC into the total metals form before using them to calculate water quality-based AHLs.

SPWRP created a metals translator following EPA Guidance: “The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion”, 1996. Plant effluent sampling data from January 1, 2014 through September 30, 2017 was used to create the conversion factors for the following pollutants: Arsenic, Chromium, Copper, Lead, Molybdenum, Nickel, Selenium, and Zinc for both acute and chronic sampling data. Matched data pairs from effluent sampling results for dissolved and total recoverable analysis was used in the translator.

Per guidance; the fraction of total recoverable metal in water that is dissolved can be computed using the following formula: Fraction dissolve (F_d) = Concentration Dissolved (C_d) divided by the Concentration Total Recoverable (C_t) or $F_d = C_d/C_t$.

The general statistics were generated using ProUCL Software Version 5.1 which was developed for the EPA by Lockheed Martin. Results are provided in Table 8.

EPA metals translator guidance also provides table values that provide acute and chronic conversion factors for several metals. SPWRP used the table values to convert the Dissolved criteria to Total Recoverable criteria when there was insufficient sampling results above the method detection limit. The table values are included in Table 9.

Table 8: General Statistics from ProUCL Software

ACUTE						
Variable	**Number of Obs.**	**Minimum**	**Maximum**	**Mean**	**Geo-Mean**	**Std. Dev.**
Arsenic CD/CT	106	0.48	1	0.924	**0.917**	0.0991
Chromium CD/CT	84	0.112	1	0.701	**0.637**	0.246
Copper CD/CT	156	0.607	1	0.796	**0.793**	0.0711
Lead CD/CT	70	0.297	1	0.768	**0.744**	0.17
Molybdenum CD/CT	151	0.852	1	0.947	**0.946**	0.0397
Nickel CD/CT	134	0.665	1	0.934	**0.932**	0.0641
Selenium CD/CT	80	0.7	1	0.941	**0.938**	0.0672
Zinc CD/CT	116	0.705	1	0.943	**0.941**	0.0619
CHRONIC						
Variable	**Number of Obs**	**Minimum**	**Maximum**	**Mean**	**Geo-Mean**	**Std. Dev.**
Arsenic CD/CT	29	0.216	1	0.853	**0.819**	0.195
Chromium CD/CT	23	0.461	1	0.742	**0.72**	0.179
Copper CD/CT	41	0.653	0.957	0.8	**0.798**	0.0545
Lead CD/CT	27	0.41	0.957	0.752	**0.733**	0.161
Molybdenum CD/CT	40	0.89	1	0.952	**0.952**	0.0301
Nickel CD/CT	38	0.644	1	0.938	**0.936**	0.0645
Selenium CD/CT	29	0.587	1	0.944	**0.938**	0.0969
Zinc CD/CT	38	0.755	1	0.965	**0.964**	0.0467

EPA metals translator guidance states that the geometric mean of the data, provided above, should be used to determine the conversion factor. Table 9 provides the final conversion factors that have been used to convert dissolved criteria to total recoverable criteria. Calculated conversion factors are shown bolded in Table 9.

Table 9: Metal Translator Conversion Factors

	Geo-Mean Acute	**Geo-Mean Chronic**	**Table Value Acute**	**Table Value Chronic**
Arsenic	***0.917***	***0.819***	1.0	1.0
Cadmium	N/A	N/A	***0.9****	***0.865****
Chromium	***0.637***	***0.72***	0.316	0.86
Copper	***0.793***	***0.798***	0.96	0.96
Hexavalent Chromium	N/A	N/A	***0.982***	***0.962***
Lead	***0.744***	***0.733***	0.638*	0.638*
Mercury	N/A	N/A	***0.85***	N/A
Molybdenum	***0.946***	***0.952***	N/A	N/A
Nickel	***0.932***	***0.936***	0.998	0.997
Selenium	***0.938***	***0.938***	N/A	N/A
Silver	N/A	N/A	***0.85***	N/A
Zinc	***0.941***	***0.964***	0.978	0.986
* Hardness dependent based on Receiving Stream Hardness of 286 mg/L as CaCO3				

8.5 Determination of Acute and Chronic Environmental Criteria With Metals Translator Conversions

SPWRP applied the metals translator conversion factors from Table 9 to criteria expressed as dissolved in Attachments G and H resulting in the criteria expressed as total recoverable.

$$EC_t = EC_d * [(1.0 – CF) +1.0]$$

EC_t = Environmental Criteria (Total Recoverable)

EC_d = Environmental Criteria (expressed as Dissolved)

CF = Conversion Factor per Table 9

The bolded data shown in Tables 10 and 11 provide the environmental criteria converted to total recoverable using the formula above. The limitations shown in Tables 10 and 11 have been used in the calculated TBLL for each pollutant of concern.

Table 10: Acute Environmental Criteria with Metals Translator Conversions

	State Aquatic Life Acute mg/L	EPA Aquatic Life Acute mg/L	State Stream Segment Specific WQS Acute mg/L	NPDES Permit Acute mg/L	Drinking Water Supply Acute mg/L
Arsenic	***0.368***	***0.368***	***0.368***	**-**	-
Benzene	5.300	-	**-**	-	-
Cadmium	***0.0075***	***0.0053***	***0.0075***	-	0.005
Chromium	***1.8360***	***1.8360***	0.05	-	0.05
Copper	***0.0437***	***0.0437***	***0.0380***	**-**	-
Cyanide	0.005	0.022	0.005	-	0.2
Hexavalent Chromium	***0.0163***	***0.0163***	***0.0163***	-	0.05
Lead	***0.2487***	***0.2487***	***0.2487***	-	0.05
Mercury	-	***0.0016***	-	-	0.002
Molybdenum	-	-	-	-	-
Nickel	***1.2165***	***1.2165***	***1.2165***	-	-
Selenium	***0.0195***	-	***0.0195***	-	-
Silver	***0.0143***	***0.0225***	***0.0143***	-	0.1
Zinc	***0.4405***	***0.3018***	***0.4405***	-	-

Table 11: Chronic Environmental Criteria with Metals Translator Conversions

	State Aquatic Life Chronic mg/L	EPA Aquatic Life Chronic mg/L	State Human Health Chronic mg/L	EPA Human Health Chronic mg/L	State Stream Segment Specific WQS Chronic mg/L	NPDES Permit Chronic mg/L	State Agriculture Chronic mg/L	Drinking Water Supply Chronic mg/L
Arsenic	***0.17715***	***0.17715***	0.00002		0.00002	-	0.1	0.00002
Benzene	-	-	0.0022	0.0021	-	-	-	0.0023
Cadmium	***0.0010669***	***0.0017933***	-	-	***0.0010669***	-	0.01	-
Chromium	***0.224***	***0.224***	-	-	***0.224***	-	0.1	-
Copper	***0.026444***	***0.026444***	1.3	1.3	***0.0250016***	-	0.2	1.0
Cyanide	-	0.0052	-	0.004	-	-	-	-
Hexavalent Chromium	***0.011418***	***0.011418***	0.1	-	-	-	0.1	-
Lead	***0.0097559***	***0.0097559***	-	-	***0.0097559***	-	0.1	-
Mercury	0.00001	0.00077	-	-	0.00001	-	-	-
Molybdenum	-	-	-	-	0.15	-	0.3	0.21
Nickel	***0.134596***	***0.134596***	0.61	0.61	***0.134596***	-	0.2	0.1
Selenium	***0.0048852***	***0.0032922***	0.17	0.17	-	-	0.02	0.05
Silver	0.002	-	-	-	0.002	-	-	-
Zinc	***0.32634***	***0.298368***	7.4	7.4	***0.32634***	-	2.0	5.0

8.6 Sludge (Biosolids) Land Application Criteria

The following table provides limitations or standards per 40 CFR Part 503.13 to protect public health and the environment from any reasonably anticipated adverse effects of certain pollutants and contaminants that may be present in biosolids.

Table 12: Biosolids Land Application Criteria

	Biosolids (mg/kg) (1)		Biosolids (mg/kg) (1)
Arsenic (total)	41	Molybdenum (total)	75
Cadmium (total)	39	Nickel (total)	420
Copper (total)	1500	Selenium (total)	100
Lead (total)	300	Zinc (total)	2800
Mercury (total)	17		

(1) EPA 40 CFR Part 503.13 Allowable Pollutant Concentrations for Land Application

8.7 Literature Process Inhibition Criteria

Per USEPA-Region 8 Technically-Based Local Limits Development Strategy, the inclusion of process inhibition criteria in the local limits development process is optional unless inhibition has been identified as a problem in the past and/or is currently a problem. In the development of the EPA approved Pollutants of Concern submittal, pollutants detected in the influent were evaluated versus the literature inhibition concentration thresholds provided by the EPA. The evaluation determined that pollutant loadings are below the literature thresholds. SPWRP has not experienced operational or maintenance problems (process interference/inhibition); as such, inhibition based allowable headworks loading calculations were not performed as part of this evaluation.

9.0 REMOVAL EFFICIENCY CALCULATIONS

Removal efficiency is the fraction or percentage of the influent pollutant loading that is removed from the waste stream across an entire wastewater treatment works or specific processes. Per EPA guidance, there are four removal efficiency calculation methodologies commonly used by POTWs the Daily Removal Efficiency (DRE), Average Daily Removal Efficiency (ADRE) method, the Mean Removal Efficiency (MRE) method, and the Decile method. Removal efficiency methodologies vary by degree of data quality and calculation method. A review of the data quality was performed, per EPA guidance, influent/effluent paired sampling events in which the influent level was zero were removed from the data set before calculating removal efficiencies. No data outliers were identified using statistical analysis. Because plant influent flows are relatively consistent, SPWRP calculated the removal efficiencies based on pollutant concentrations versus influent/effluent pollutant loadings. Data used in the removal efficiency calculations was obtained from influent/effluent pollutant scans (January 2013 through September 2017).

9.1 DRE Method

The Daily Removal Efficiency (DRE) is calculated using matched pairs of influent/effluent sampling results. Influent/effluent paired sampling events in which either the influent or effluent samples provided results below the MDL were removed from the data set.

The DRE (removal percentage) is calculated as:
[Influent Concentration – Effluent Concentration] / Influent Concentration x 100

The set of valid individual DREs is then averaged to determine the DRE for a pollutant. Removal efficiencies were not calculated using the DRE method for Benzene, Cadmium, Cyanide, Hexavalent Chromium, and Mercury due to the

limited number of matched influent or effluent samples with detections above the MDL. Removal efficiency calculations using the DRE method are provided in Table 13.

9.2 ADRE Method

The ADRE is calculated similar to the DRE method. The DRE for each matched pair of influent/effluent sampling results are averaged to calculate the removal efficiency for the pollutant.

The ADRE method allows for the use of censored data, (1/2 the MDL) was substituted for effluent results reported as below the MDL threshold in the removal efficiency Removal efficiencies were not calculated for Benzene, Cadmium, Cyanide, Hexavalent Chromium, and Mercury due to the limited number of influent or effluent samples with detections above the MDL. Removal efficiency calculations using the ADRE method are provided in Table 13.

9.3 MRE Method

The MRE is calculated by using the same formula as for the DRE, but instead of using individual influent and effluent values from sampling days/events, the set of influent values is first averaged to determine the average influent value and the same is done for the set of effluent values. These average values are then used in the DRE equation to result in the MRE for a pollutant. The MRE can be based on Influent and effluent sample values that are not always paired. Censored data (1/2 MDL) was substituted for influent and effluent results reported as below the MDL threshold and the adjusted average pollutant concentrations were used in the MRE calculations. Removal efficiencies were not calculated for Benzene, Cyanide, and Hexavalent Chromium due to the limited number of influent or effluent samples with detections above the MDL. Removal efficiency calculations using the MRE method are provided in Table 13.

9.4 Decile Method

The Decile Method, unlike the ADRE and MRE methods, considers how often the actual plant daily removal efficiency will be above or below a specified removal rate, thereby taking into account the variability of POTW removal efficiencies over time. Each decile is the value below which a certain percentage of the DREs fall. For example, the first decile is the value below which 10% of the DREs fall. Similarly, the second decile is the value below which 20% of the DREs fall, on up to the ninth decile, which is the value below which 90% of the DREs fall. The fifth decile is the median and half of the DREs fall below this number. The main value of the decile approach is that it provides an estimate of how often a POTW is expected to exceed certain removal values,

such as the ADRE and MRE. For the example, assuming the MRE is 53%; if the MRE falls in the fourth decile the plant's actual removal rate will exceed the MRE 60% of the time. If an Allowable Headworks Loading (Section 10) for Copper is based on sludge land application criteria and used the 53% MRE and the plant has an actual removal efficiency of 70% more Copper may end up in the sludge than allowed for thus resulting in a potential exceedance. To apply the decile approach, a minimum of nine "matched pairs" of DREs are required. With this limitation, SPWRP was able to calculate Decile Removal Efficiencies for Arsenic, Copper, Lead, Molybdenum, Nickel, Selenium, and Zinc. Removal efficiency calculations using the Decile method are provided in Table 13.

9.5 Literature Values

Removal efficiencies are based largely on site-specific conditions such as climate, POTW design, operation and maintenance, plant conditions, and sewage characteristics. Therefore, EPA strongly suggests that site-specific data be used to calculate removal efficiencies. However, after conducting site-specific sampling, there are some pollutants that do not have adequate data (observations above the method detection limit) to calculate removals. In these instances, POTWs may selectively use removal efficiencies (Literature Values) reported by other POTWs or by studies that have been published in professional journals or by EPA. EPA urges POTWs to use performance data from plants employing the same treatment technology and similar contributing sources. The EPA guidance provides a listing of removal efficiency data for priority pollutants gathered from other POTWs. The EPA Literature Value removal efficiency based POTWs with similar treatment processes was used for Benzene. An EPA literature value has not been developed for Hexavalent Chromium, SPWRP will use a removal efficiency value developed through multiple local limit studies including the SPWRP 2009 TBLL study by the consulting firm of CWA Consulting Services. Literature Values are by values are provided in Table 13.

Table 13: Removal Efficiency Calculation Results

				Decile					Literature Values		
	DRE %	ADRE %	MRE %	25%ile	50%ile	75%ile	80%ile	90%ile	20%ile	50%ile	80%ile
Arsenic	48.35	62.76	82.75	41.89	51.67	91.59	93.13	94.55	N/A	N/A	N/A
Benzene	N/A	N/A	N/A	N/A					40	50	54
Cadmium	N/A	N/A	85.52	N/A					33	68	93
Chromium	80.74	87.36	74.09	N/A					34	55	71
Copper	85.14	85.14	87.43	83.33	86.36	87.09	87.6	88.92	32	61	89
Cyanide	N/A	N/A	N/A	N/A					33	59	79
Hexavalent Chromium	N/A	N/A	N/A	N/A						82*	
Lead	80.36	89.53	92.82	73.95	82.69	90.65	91.17	91.5	25	55	70
Mercury	N/A	N/A	86.65	N/A					33	50	62
Molybdenum	19.22	19.22	13.02	11.81	18.96	24.4	25.86	35.98	N/A		
Nickel	17.68	34.90	40.47	10.66	15.22	20.7	22.63	34.95	11	29	57
Selenium	48.13	48.13	57.48	42.25	46.88	52.1	54.23	59.92	N/A		
Silver	85.59	93.80	91.70	N/A					38	66	86
Zinc	68.93	68.93	77.79	62.24	69	73.68	75.55	79.21	34	67	81

*Median POTW removal efficiency for Hexavalent Chromium from CWA Consulting Services as provided in SPWRP Local Limits study, 2009.

9.6 Determination of Final Removal Efficiencies

Per EPA guidance, in developing local limits, appropriate removal efficiencies must be selected for calculation of AHLs for each pollutant. EPA recommends the MRE over the ADRE method if less than ten data pairs are available, because it is generally less sensitive to variation in daily removal efficiencies. EPA also recommends that POTWs consider using the decile approach or the MRE method because they better account for variabilities in removal efficiencies over time. In the final determination of removal efficiencies used in the Allowable Headworks Calculations, SPWRP, using EPA recommendations and best professional judgement, will use the Decile method at the 75%ile for pollutants that are subject to biosolids land application limitations per 40 CFR Part 503, with the exception of Cadmium and Mercury. The decile method will adequately protect against exceedances of sludge disposal standards. The Mean Removal Efficiency (MRE) will be used for pollutants not subject to land application limitations or have less than ten data pairs. The MRE has also been used for Cadmium and Mercury due to insufficient matched pair of influent/effluent sampling results (see section 9.4). Removal efficiencies based on 50%ile Literature Values provided by the EPA for similar POTWs or values provided by other professional research will be used when data quality prohibits the use of the DRE, ADRE, MRE, and Decile methods.

Table 14: Final Determination of Percent Removal Efficiencies

	Removal Efficiency	Criteria
Arsenic, Total	91.59	Decile
Benzene	50	Literature
Cadmium, Total	85.52	MRE
Chromium, Total	74.09	MRE
Copper, Total	87.09	Decile
Cyanide	59	Literature
Hexavalent Chromium	82	Literature
Lead, Total	90.65	Decile
Mercury, Total	86.65	MRE
Molybdenum, Total	24.4	Decile
Nickel, Total	20.7	Decile
Selenium, Total	52.1	Decile
Silver, Total	91.7	MRE
Zinc, Total	73.68	Decile

10.0 CALCULATION OF ALLOWABLE HEADWORKS LOADING

EPA guidance recommends that POTWs base their TBLLs on Maximum Allowable Headworks Loading (MAHL) calculated for each pollutant of concern. A MAHL is the upper limit of pollutant loading at which a POTW will not violate any treatment plant or environmental criteria developed to prevent process inhibition or interference, or violation of effluent, or sludge quality standards. MAHLs are the basis for local limits. A pollutants MAHL is determined by first calculating the Allowable Headworks Loading (AHL) for each limiting criterion; the most stringent AHL would be the MAHL. The AHL for each pollutant is a function of limiting criteria (environmental or process), plant flows, and plant removal efficiency.

10.1 Allowable Headworks Loading Based on Acute and Chronic NPDES Permit Criteria

As provided in Attachment G, there are no numeric maximum effluent limitations listed in the SPWRP discharge permit for the pollutants being evaluated in this TBLL study; as such, AHL calculations based on acute and chronic permit criteria have not been performed.

10.2 Allowable Headworks Loading Based on Acute Water Quality Criteria

Per EPA guidance, the standard equation used to determine AHLs based on Acute Water Quality Criteria, including State Stream Segment Criteria, Limitations based on State Drinking Water Supply, and State and Federal Acute Aquatic Life Water Quality limitations:

$AHL = (8.34 [C_{WQ} (Q_{STR} + Q_{POTW}) – (Q_{STR} * C_{STR}]) / (1 – RE)$

AHL = Allowable Headworks Loading in lbs/Day
C_{WQ} = Acute Environmental Criteria, in mg/L (from Table 10)
Q_{STR} = Acute Receiving Stream (upstream) Flow Rate, in mgd
Q_{POTW} = Maximum Projected Plant Influent Flow Rate, in mgd
C_{STR} = Average Receiving Stream Background Concentration, in mg/L (from Attachment F)
RE = Removal Efficiency from Headworks to Effluent, in decimal (from Table 14)

Per Section 5.1, the Maximum Projected Plant Influent Rate (Q_{POTW}) = 30.7 mgd.
Per Section 5.6, the Acute Receiving Stream Flow Rate (Q_{STR}) = 10.34 mgd.
Per EPA guidance, Federal limitations should be used only in the absence of State criteria.

Table 15: Allowable Headworks Loading Based on Acute Water Quality Criteria

	State Aquatic Life Acute (lbs/Day)	EPA Aquatic Life Acute (lbs/Day)	State Stream Segment Specific WQS Acute (lbs/Day)	Drinking Water Supply Acute (lbs/Day)
Arsenic	**1321.5242**	**1321.5242**	**1321.5242**	**-**
Benzene	**3628.1002**	**-**	**-**	**-**
Cadmium	**17.72826**	**12.52797**	**17.72826**	**11.81884**
Chromium	**2424.9248**	**2424.9248**	**65.601581**	**65.601581**
Copper	**110.05**	**110.05**	**94.94**	**-**
Cyanide	**4.17406829**	**18.3659**	**4.17406829**	**166.9627**
Hexavalent Chromium	**30.994776**	**30.994776**	**30.994776**	**95.076**
Lead	**909.69**	**909.69**	**909.69**	**182.31**
Mercury	**-**	**4.1021555**	**-**	**5.1276944**
Molybdenum	**-**	**-**	**-**	**-**
Nickel	**525.11**	**524.89**	**524.89**	**-**
Selenium	**13.58**	**-**	**13.58**	**-**
Silver	**58.450538**	**92.26552**	**58.450538**	**411.85834**
Zinc	**567.82**	**387.45**	**567.82**	**-**

10.3 Allowable Headworks Loading Based on Chronic Water Quality Criteria

Per EPA guidance, the standard equation used to determine AHLs based on Chronic Water Quality Criteria, including State Stream Segment Criteria, Limitations based on State Drinking Water Supply, State Agricultural Criteria, and State and Federal Chronic Aquatic Life and Human Health Water Quality limitations:

$AHL = (8.34 [C_{WQ} (Q_{STR} + Q_{POTW}) – (Q_{STR} * C_{STR}]) / (1 – RE)$

AHL = Allowable Headworks Loading in lbs/Day
C_{WQ} = Chronic Environmental Criteria, in mg/L (from Table 11)
Q_{STR} = Chronic Receiving Stream (upstream) Flow Rate, in mgd
Q_{POTW} = Maximum Projected Plant Influent Flow Rate, in mgd
C_{STR} = Average Receiving Stream Background Concentration, in mg/L (from Attachment F)
RE = Removal Efficiency from Headworks to Effluent, in decimal (from Table 14)

Per Section 5.1, the Maximum Projected Plant Influent Rate (Q_{POTW}) = 30.7 mgd.
Per Section 5.6, the Chronic Receiving Stream Flow Rate (Q_{STR}) = 15.51 mgd.
Per EPA guidance, Federal limitations should be used only in the absence of State criteria.

Table 16: Allowable Headworks Loading Based on Chronic Water Quality Criteria

	State Aquatic Life Chronic (lbs/Day)	EPA Aquatic Life Chronic (lbs/Day)	State Human Health Chronic (lbs/Day)	EPA Human Health Chronic (lbs/Day)	State Stream Segment Specific WQS Chronic (lbs/Day)	State Agriculture Chronic (lbs/Day)	Drinking Water Supply Chronic (lbs/Day)
Arsenic	**547.53**	**547.53**	**(1)**		**-264.17**	**193.99**	**-264.17**
Benzene			**1.70**	**1.62**			**1.77**
Cadmium	**2.84**	**4.77**			**2.84**	**26.62**	
Chromium	**332.51**	**332.51**			**332.51**	**148.07**	
Copper	**70.22**	**70.22**	**3872.06**	**3872.06**	**65.92**	**588.33**	**2976.50**
Cyanide		**4.89**					
Hexavalent Chromium	**24.45**	**24.45**	**214.11**			**214.11**	
Lead	**39.13**	**39.13**			**39.13**	**411.10**	
Mercury	**0.030**	**2.22**			**0.029**		
Molybdenum					**70.97**	**142.54**	**99.60**
Nickel	**65.16**	**65.16**	**296.20**	**296.20**	**66.16**	**96.94**	**48.34**
Selenium	**3.40**	**2.12**	**136.25**	**136.25**		**15.56**	**39.70**
Silver	**8.51**				**8.51**		
Zinc	**470.32**	**429.36**	**10827.95**	**10827.95**	**470.32**	**2920.98**	**7313.74**

(1) State Human Health Chronic headworks loading is established as “current conditions” per a temporary modification under CDPHE Regulation 38.

10.4 Allowable Headworks Loading Based on Land Application Criteria

Per EPA guidance, the standard equation used to determine AHLs based on biosolids Land Application and Surface Disposal:

$AHL = [(8.34) (C_{SLDSTD}) (PS/100) (Q_{SLDG}) (G_{SLDG})] / (1 – RE)$

AHL = Allowable Headworks Loading in lbs/Day
C_{SLDSTD} = Sludge Standard, in mg/kg dry sludge (from Table 17)
PS = Percent Solids of Sludge to Disposal
Q_{SLDG} = Total Sludge Flow Rate to Disposal, in mgd
G_{SLDG} = Specific Gravity of Sludge, in kg/L
RE = Removal Efficiency from Headworks to Effluent, in decimal (from Table 14)

Per Section 5.5, the Percent Solids of Sludge (PS) = 18.4, the Total Sludge Flow Rate to Disposal (Q_{SLDG}) = 0.142 mgd, and Specific gravity of Sludge = 1.06 kg/L.

Table 17: Allowable Headworks Loading Based on Land Application Criteria

	40 CFR Part 503.13 Sewage Sludge Pollutant Concentration Limitations (mg/kg)	Allowable Headworks Loading (lbs/Day)
Arsenic	41	**10.34**
Cadmium	39	**10.53**
Copper	1500	**397.83**
Lead	300	**76.44**
Mercury	17	**4.53**
Molybdenum	75	**71.00**
Nickel	420	**468.66**
Selenium	100	**44.33**
Zinc	2800	**877.78**

11.0 MAXIMUM OF ALLOWABLE HEADWORKS LOADING (MAHL)

The Maximum Allowable Headworks Loading (MAHL) for each pollutant of concern is defined as the most stringent AHL. The following table provides the MAHL based on the AHL calculations provided in Section 10.0.

Table 18: Maximum Allowable Headworks Loadings (MAHL)

	Maximum Allowable Headworks Loading (lbs/Day)	Limiting Criteria
Arsenic	**0.503317**	State Human Health - Chronic, CDPHE Regulation 38, Temporary Modification "Current Conditions"
Benzene	**1.6957222**	State Human Health - Chronic
Cadmium	**2.8396**	State Aquatic Life - Chronic
Chromium	**65.60158**	State Aquatic Life - Acute & WS
Copper	**65.9181**	State Stream Segment Specific WQS - Chronic
Cyanide	**4.1740683**	State Aquatic Life - Acute
Hexavalent Chromium	**24.44666**	State Aquatic Life - Chronic
Lead	**39.1292**	State Aquatic Life - Chronic
Mercury	**0.028868**	State Aquatic Life - Chronic
Molybdenum	**70.998556**	Biosolids
Nickel	**48.341823**	State Drinking Water Supply - Chronic
Selenium	**3.398042**	State Aquatic Life - Chronic
Silver	**8.505953**	State Aquatic Life - Chronic
Zinc	**470.31771**	State Aquatic Life - Chronic

12.0 TECHNOLOGY BASED LIMITATION FOR BTEX

BTEX is the sum of measured concentrations for Benzene, Toluene, Ethylbenzene, and Xylene.

Per USEPA-Region 8 Technically-Based Local Limits Development Strategy, The POTW may establish local limits for BTEX on a variety of criteria including fume toxicity, aquatic life protection, etc. An additional alternative exists for the POTW. This includes establishing technically-based limits for BTEX based on treatment technology. Information on this may be found in the EPA publication "Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks", June, 1989. The Technology based limit for POTWs to accept ground water cleanup wastes is 750 ug/l (0.75 mg/L)

The BTEX limit- is achievable by current technology. The overall technology assumed approximately 15 mg/l of dissolved product is treated to a removal efficiency of 95% (commercially available stripper unit).

Based on EPA guidance, SPWRP will maintain currently established wastewater discharge limitation (Local Limit) for **BTEX: 0.75 mg/L**

13.0 MAXIMUM ALLOWABLE INDUSTRIAL LOADING (MAIL)

MAHLs estimate the maximum combined loadings that can be received at the POTW's headworks from all sources and represents the upper limit of pollutant loading at which a POTW will not violate any treatment plant or environmental criteria developed to prevent process inhibition or interference, or violation of effluent, or sludge quality standards.

The Maximum Allowable Industrial Loading (MAIL) developed for each pollutant of concern represents the amount of pollutant loading the POTW chooses to control through local limits. Consistent with the City's Municipal Codes, Local Limits developed by the SPWRP are enforced upon Significant Industrial Users (SIUs) or Industrial Users issued a discharge permit.

The equation for calculating the MAIL is as follows:

$$MAIL = [(MAHL\ Less\ Safety\ Factor - L_{UNC}) * (1\text{-}GA)] - L_{HW}$$

MAIL = Maximum Allowable Industrial Loading in lbs/Day
L_{UNC} = Loading from uncontrolled sources (domestic + commercial) in lbs/Day
GA = Growth and Expansion Allowance in lbs/day, a portion of the loading held in reserve to protect the POTW against expansion of current permitted industries and additional permitted industries moving into the service area
L_{HW} = Loading from Hauled Wastes received at the SPWRP Septic Receiving Station in lbs/day

13.1 Maximum Allowable Headworks Loading Safety Factor

EPA Region 8 requires that a safety + growth factor of at least ten (10) percent to be subtracted from the calculated MAHL. The main purpose of a safety factor is to address data "uncertainties" that can affect the ability of the POTW to calculate accurate local limits such as variability and quality of the POTW's data, potential for industrial user slug loadings (e.g., as a result of a chemical spill), and potential service area growth. The MAHL minus a 10% safety factor is provided in Table 19

Table 19: MAHL minus 10% Safety Factor

	Maximum Allowable Headworks Loading Less 10% Safety Factor (lbs/Day)
Arsenic	0.452985
Benzene	1.52615
Cadmium	2.55564
Chromium	59.041422
Copper	59.32629
Cyanide	3.7566615
Hexavalent Chromium	22.001994
Lead	35.21628
Mercury	0.0259812
Molybdenum	63.8987
Nickel	43.507641
Selenium	3.0582378
Silver	7.6553577
Zinc	423.28594

13.2 Loading From Uncontrolled Sources

As noted in section 13.0, some sources of pollutant loadings to the POTW are considered uncontrolled. They include domestic users and commercial dischargers not operating under a discharge permit. Because the POTW does not control the loadings that these users discharge (except through the general and specific prohibitions in the city's sewer use ordinance), the POTW needs to subtract these loadings from its MAHLs before it can determine the MAIL (see the equation for calculating the MAIL above).

As provided in section 3.5 and Attachment E, commercial and residential sampling results from January 1, 2013 through September 30, 2017 were used to determine the average pollutant concentrations for the pollutants of concern.

As provided in section 5.0 the projected maximum monthly wastewater flow to the SPWRP is 30.7 mgd of which, 29.6 mgd is from uncontrolled sources; (30.7 mgd - (SIU flows + Hauled Wastes received at the plants septic receiving station). Per section 5.4, the percentage of plant influent assumed from domestic sources is 65% or 19.24 mgd and assumed from commercial sources is 35% or 10.36 mgd.

The equation for calculating the Loading from domestic and commercial sources is as follows:

$L_{UNC} = (C_{UNC})(Q_{UNC})(8.34)$

L_{UNC} = Loading from uncontrolled sources (domestic or commercial) in lbs/Day
C_{UNC} = Uncontrolled pollutant concentration, mg/L
Q_{UNC} = Uncontrolled flow rate, mgd
8.34 = Unit conversion factor.

The loading from uncontrolled sources is provided in Table 20.

Table 20: Domestic and Commercial Loading

Domestic				
	C_{UNC} = Uncontrolled Pollutant Concentration, mg/L	**Q_{UNC} = Uncontrolled Flow Rate, mgd**	**Unit Conversion Factor**	**L_{UNC} = Loading in lbs/Day**
Arsenic	0.00103	19.24	8.34	**0.1625**
Benzene	0	19.24	8.34	**0**
Cadmium	0.00032	19.24	8.34	**0.0517**
Chromium	0.00155	19.24	8.34	**0.2491**
Copper	0.05899	19.24	8.34	**9.4663**
Cyanide	0.00000	19.24	8.34	**0.0000**
Hexavalent Chromium	0.00274	19.24	8.34	**0.4390**
Lead	0.00718	19.24	8.34	**1.1518**
Mercury	0.00003	19.24	8.34	**0.0054**
Molybdenum	0.00690	19.24	8.34	**1.1070**
Nickel	0.00436	19.24	8.34	**0.6992**
Selenium	0.00193	19.24	8.34	**0.3095**
Silver	0.00024	19.24	8.34	**0.0388**
Zinc	0.15148	19.24	8.34	**24.3064**
Commercial				
	C_{UNC} = Uncontrolled Pollutant Concentration, mg/L	**Q_{UNC} = Uncontrolled Flow Rate, mgd**	**Unit Conversion Factor**	**L_{UNC} = Loading in lbs/Day**
Arsenic	0.00148	10.36	8.34	**0.1278**
Benzene	0	10.36	8.34	**0**
Cadmium	0.00095	10.36	8.34	**0.0822**
Chromium	0.00728	10.36	8.34	**0.6289**
Copper	0.14140	10.36	8.34	**12.2171**
Cyanide	0.00412	10.36	8.34	**0.3563**
Hexavalent Chromium	0.00320	10.36	8.34	**0.2765**
Lead	0.02997	10.36	8.34	**2.5896**
Mercury	0.00011	10.36	8.34	**0.0098**
Molybdenum	0.01441	10.36	8.34	**1.2452**
Nickel	0.02459	10.36	8.34	**2.1245**
Selenium	0.00209	10.36	8.34	**0.1804**
Silver	0.00308	10.36	8.34	**0.2659**
Zinc	0.28969	10.36	8.34	**25.0303**

Domestic Plus Commercial Loading			
	Domestic Loading in lbs/Day	**Commercial Loading in lbs/Day**	**Total Uncontrolled Loading in lbs/Day**
Arsenic	**0.1625**	**0.1278**	**0.2903**
Benzene	**0**	**0**	**0**
Cadmium	**0.0517**	**0.0822**	**0.1339**
Chromium	**0.2491**	**0.6289**	**0.8780**
Copper	**9.4663**	**12.2171**	**21.6834**
Cyanide	**0.0000**	**0.3563**	**0.3563**
Hexavalent Chromium	**0.4390**	**0.2765**	**0.7155**
Lead	**1.1518**	**2.5896**	**3.7414**
Mercury	**0.0054**	**0.0098**	**0.0152**
Molybdenum	**1.1070**	**1.2452**	**2.3522**
Nickel	**0.6992**	**2.1245**	**2.8238**
Selenium	**0.3095**	**0.1804**	**0.4899**
Silver	**0.0388**	**0.2659**	**0.3047**
Zinc	**24.3064**	**25.0303**	**49.3366**

13.3 Growth Allowance

Growth and Expansion Allowance in lbs/day, is the portion of the MAHL held in reserve to protect the POTW against expansion of current permitted industries.

Per EPA Guidance, A POTW that anticipates growth in the future can consider holding in reserve a portion of its MAHLs for this growth. This expansion/growth allowance is separate from the safety factor. By holding in reserve some of the MAHL, the POTW has a portion to allocate to accommodate growth or expansion and may not need to revise its existing Industrial User permits or Sewer Use Ordinance.

Based on a review of discharge volumes from permitted industries (2016 – 2017), the average daily discharge has increased approximately 10 percent. Based on the assumption of continued increase in discharge volumes from permitted industries, a growth and expansion allowance of 10% has been applied in the calculation of the MAIL.

13.4 Hauled Wastes

SPWRP does not control the pollutant loading received at the plant's septic receiving station through local limits, as such; the loading from this source must be subtracted from the MAHL before determination of the MAIL. (see the equation for calculating the MAIL above).

As provided in section 3.2 and Attachment B, hauled waste sampling results from January 1, 2014 through September 30, 2017 were used to determine the average pollutant concentrations for the pollutants of concern.

As provided in section 5.2 the maximum daily flow volume received at the septic receiving station was 0.0451 mgd.

The equation for calculating the Loading from hauled wastes is as follows:

$L_{HW} = (C_{HW})(Q_{HW})(8.34)$

L_{HW} = Loading from hauled wastes in lbs/Day
C_{HW} = Average pollutant concentration, mg/L
Q_{HW} = Maximum daily flow rate, mgd
8.34 = Unit conversion factor.
The loading from hauled wastes is provided in Table 21.

Table 21: Hauled Waste Loading

	C_{HW} = Average pollutant concentration, mg/L	**Q_{HW} = Maximum daily flow rate, mgd**	**Unit Conversion Factor**	**L_{HW} = Loading from hauled wastes in lbs/Day**
Arsenic	0.026	0.0451	8.34	**0.0099**
Benzene	N/A	N/A	N/A	**0.0000**
Cadmium	0.006	0.0451	8.34	**0.0024**
Chromium	0.064	0.0451	8.34	**0.0241**
Copper	1.55	0.0451	8.34	**0.5817**
Cyanide	N/A	N/A	N/A	**0.0000**
Hexavalent Chromium	N/A	N/A	N/A	**0.0000**
Lead	0.151	0.0451	8.34	**0.0567**
Mercury	0.001	0.0451	8.34	**0.0002**
Molybdenum	0.025	0.0451	8.34	**0.0093**
Nickel	0.058	0.0451	8.34	**0.0219**
Selenium	0.013	0.0451	8.34	**0.0049**
Silver	0.0020	0.0451	8.34	**0.0008**
Zinc	5.64	0.0451	8.34	**2.1229**

13.5 Determination of Final Maximum Allowable Industrial Loadings

Table 22 provides the MAIL based on the information provided throughout this section and the following equation as provided in section 13.0

MAIL = [(MAHL Less Safety Factor $– L_{UNC}$) * (1-GA)] - L_{HW}

Table 22: Maximum Allowable Industrial Loading (MAIL)

	Maximum Allowable Industrial Loading lbs/Day
Arsenic	**0.1347**
Benzene	**1.3735**
Cadmium	**2.1772**
Chromium	**52.3230**
Copper	**33.2970**
Cyanide	**3.0603**
Hexavalent Chromium	**19.1578**
Lead	**28.2707**
Mercury	**0.0095**
Molybdenum	**55.3826**
Nickel	**36.5936**
Selenium	**2.3066**
Silver	**6.6148**
Zinc	**334.4315**

14.0 RESERVE LOADING

When a POTW allocates the EPA approved MAIL to individual industrial users, the POTW generally retains a portion of the MAIL in reserve so that new industrial users can be given an allocation out of the existing MAIL. This also allows the POTW flexibility to release the reserve loading as necessary without EPA approval as a substantial program modification or public notice. If the release of the reserve results in a change to the calculated uniform or mass based local limit, revisions to the POTW's legal authority must occur. The allowable industrial loading held in reserve may also be allocated to industrial users requesting special isolated discharge events as long as the MAHL and MAIL are not exceeded. The SPWRP is holding in reserve 10-percent of the calculated Maximum Allowable Industrial Loading. Table 23 provides the loading held in reserve and loading allocated for the calculation on the uniform local limits.

Table 23: Reserve Loading

	Loading Held in Reserve from the Calculated Maximum Allowable Industrial Loading lbs/Day	Maximum Allowable Industrial Loading Less Reserve Loading lbs/Day
Arsenic	0.0135	0.1212
Benzene	0.1374	1.2362
Cadmium	0.2177	1.9595
Chromium	5.2328	47.0954

Copper	3.3297	29.9672
Cyanide	0.3060	2.7543
Hexavalent Chromium	1.9158	17.2420
Lead	2.8271	25.4437
Mercury	0.0010	0.0086
Molybdenum	5.5383	49.8443
Nickel	3.6594	32.9343
Selenium	0.2307	2.0760
Silver	0.6615	5.9534
Zinc	33.4432	300.9884

15.0 ALLOCATION OF MAILS AMONG CONTROLLED SOURCES

Per EPA guidance, “local limits can take many forms based on how MAILs are allocated to IUs. The designation and implementation of these MAILs, including the allocation of loadings to IUs, are left to each POTW, as long as the implementation procedures do not allow the calculated MAHL to be exceeded and provide a reasonable method for making allocations to the IUs.”

“A POTW may select any allocation and implementation method that results in enforceable local limits to prevent pass through and interference and to comply with the prohibitions in the Federal regulations. The POTW should choose the allocation approach that best fits its own situation.”

“Ultimately, the POTW will want to allocate pollutant loadings in a fair and sensible way that does not favor any one industry or group of industries, considers the economic impacts, maintains compliance with the NPDES permit, and otherwise achieves the environmental goals of the program.”

Consistent with the city’s legal authority and current SPWRP local limits allocation method, the Uniform Concentration Method based on each MAIL and total SIU flow will be implemented. The uniform limits yields one limit per pollutant expressed as a single concentration applicable to all controlled users.

16.0 LIMIT DURATION

Per EPA guidance, “When applying its local limits, a POTW needs to determine the appropriate limit duration. The POTW may establish limits that are daily maximums, monthly averages, or instantaneous maximums. In general, a POTW should base the limit duration on the type of criteria – long-term or short-term – used to develop the local limit. However, most local limits will be implemented as daily maximums based upon two main factors: 1) the short-term nature of the event that the local limit is protecting against; and 2) the infrequency of IU sampling.”

The EPA recommends use of a daily maximum in the following circumstances:

1.) *A local limit based upon short-term criteria, e.g. acute standards or Daily permit limits, should be a daily maximum.*

2.) *A local limit based upon long-term criteria, BUT protecting against a short-term event, should be a daily maximum. For example, a local limit based on chronic water quality criteria would appear to warrant assigning a long-term limit duration such as monthly average. However, the local limit should be considered a daily maximum because the MAHL calculation using water quality criteria is based on either the receiving stream's 1Q10 or 7Q10 flows, both of which are short-term phenomena.* (Colorado regulations specify the use of low flow conditions using 1E3 (acute) and 30E3 (chronic).

Consistent with the city’s legal authority and current SPWRP local limits duration, Local limits will be enforced upon SIUs as Daily Maximums.

17.0 CALCULATED UNIFORM LOCAL LIMITS

The uniform concentration limit calculation equation is as follows:

C_{LIM} = MAIL less reserve / (Q_{CONT} x 8.34)

C_{LIM} = Uniform concentration limit, mg/L
MAIL = Maximum allowable industrial loading, lb/day
Q_{CONT} = Total flow rate from SIUs, MGD
8.34 = Unit conversion factor

As provided in section 5.3 and Table 6, the total flow rate from SIUs based on daily maximum discharge is 1050660 GPD, thus Q_{CONT} = 1.05066 MGD.

The MAIL less reserve for each pollutant is provided in Table 23.

The calculated Uniform Concentration based Local Limits are provided in Table 24.

Table 24: Calculated Uniform Local Limits

	MAIL Less Reserve, lb/day	Q_{CONT} = Total flow rate from SIUs, MGD	Unit Conversion Factor	C_{LIM} = Uniform concentration limit, mg/L
Arsenic	0.1212	1.05066	8.34	0.014
Benzene	1.2362	1.05066	8.34	0.141
Cadmium	1.9834	1.05066	8.34	0.224
Chromium	47.6699	1.05066	8.34	5.375
Copper	23.9017	1.05066	8.34	3.420
Cyanide	2.78823	1.05066	8.34	0.314
Hexavalent Chromium	17.4549	1.05066	8.34	1.968
Lead	34.4803	1.05066	8.34	2.904
Mercury	0.0087	1.05066	8.34	0.001
Molybdenum	50.4411	1.05066	8.34	5.688
Nickel	32.0301	1.05066	8.34	3.759
Selenium	1.9092	1.05066	8.34	0.237
Silver	6.0278	1.05066	8.34	0.679
Zinc	251.4516	1.05066	8.34	34.350

18.0 LOCAL LIMITS ASSESSMENT

Per EPA guidance, after developing and allocating local limits, POTWs should determine whether their local limits pass a “common sense test.” Some of the questions a POTW should ask to determine if its limits pass the “common sense” test are:

1.) Are the limits technologically achievable? Are SIUs and other controlled dischargers likely to meet these limits with currently available forms of pretreatment and pollution prevention (e.g., process modifications)?

2.) Can the POTW and dischargers determine compliance with the local limits? Are the limits above sampling method detection levels?

18.1 Achievability of Calculated Local Limits by Treatment

A review of the calculated Local Limits versus SIU average and maximum pollutant concentrations as provided in Attachment D was performed. The calculated limits are achievable by all SIUs using current treatment processes. The sampling results shown in Attachment D for Cyanide are the result of “end of process” sampling as required per categorical standards. Local Limits are developed for “end of pipe” monitoring, which provides pollutant concentration limitations for the POCs after mixing with other process wastewaters. SPWRP feels that the Local Limit for Cyanide is achievable at permitted facilities though pretreatment and standard operating procedures used for pollution prevention.

18.2 Compliance of Calculated Local Limits Versus Sampling Method Detection Levels

A review of the calculated Local Limits versus the analysis methods provided by the certified laboratories used locally by current SIUs shows that compliance can be determined versus the method and reporting limits.

18.3 Assessment of Calculated Local Limits Versus Previously Calculated Limits Table

Table 25 provides a comparison of the numeric calculated Local Limits versus the numeric Local Limits established during the last study (2009).

Table 25: Calculated Local Limits Versus Previously Established Limits

	2009 Calculated Uniform Local Limits (mg/L)	2018 Calculated Uniform Local Limits (mg/L)
Arsenic	0.55	0.014
Benzene	0.050	0.14
BTEX	0.750	0.750
Cadmium	0.30	0.22
Chromium	2.90	5.37
Copper, Total	3.94	3.42
Cyanide	N/A	0.31
Hexavalent Chromium	0.86	1.97
Lead	0.51	2.90
Mercury	0.005	0.001
Molybdenum	2.82	5.69
Nickel	2.66	3.76
Selenium	0.054	0.24
Silver	0.112	0.68
Zinc	8.8	34.35

Per EPA guidance, on occasion, a relaxation of local limits may be appropriate. The “anti-backsliding” concept associated with NPDES permit limits does not apply to local limits. Local limits apply to a particular IU and can be raised or lowered based on the periodic re-evaluation of the need for those limits.

The Local Limits developed during this technically-based evaluation are based on current conditions and have been developed to protect the treatment plant, sewage system, biosolids and receiving water from adverse impacts from industrial and commercial wastewater dischargers.

Since the 2009 Local Limits Study, three major health providing facilities have been removed from the list of SIUs resulting in a substantial decrease in the SIU flows. Per the mathematical formula used to calculate the uniform local limit from

the MAIL (section 17.0), the reduction in total SIU flows may result in less stringent local limit for some pollutants.

The 2009 Local Limits Study calculations applied an anticipated growth and expansion factor of 30% in determining the MAIL. Since 2009, the growth and expansion was substantially less. For this study, the MAILs have been calculated using a growth and expansion factor of 10%. Per the mathematical formula used to calculate the MAIL (section 13.0), the reduction in the growth and expansion factor may result in less stringent local limit for some pollutants.

18.4 Assessment of Calculated Local Limits Versus Previously Calculated Limits Narrative

Arsenic: The Local Limit for Arsenic has decreased due to a substantial lowering of the State Chronic Human Health Water Quality Standard. The Technically based Local Limit has been calculated based on a temporary modification as provided in State Regulation No. 38 - Classifications and Numeric Standards for South Platte River Basin. The modification allows for use of “current conditions”. See section 8.3.

Benzene: The previous Local Limit for Benzene of 0.05 mg/L was based on treatment technology as allowed for per EPA guidance. The Local Limit for Benzene developed during this evaluation has been calculated based on local conditions and is Technically based.

The evaluation versus previous limits for BTEX is provided in Section 12.0.

Cadmium: The Local Limit for Cadmium has decreased because of more stringent State Chronic Water Quality Standards, resulting in a reduction in the maximum allowable headworks loading.

Chromium (total): Plant removal efficiencies and State Acute Water Quality Standards have remained consistent. The Local Limit for Chromium has been relaxed due to an increase in the MAIL resulting from the reduced loading from domestic and commercial sources, reduced background receiving stream concentrations, lower growth and expansion expectations, and reduction in the total SIU discharge volume from the volume used in the 2009 Local Limits Study.

Copper: The Local Limit for Copper has decreased due to a substantial lowering of the State Chronic Receiving Stream Water Quality Standard.

Cyanide (total): A Local Limit for Cyanide was not pursued during the previous Local Limits Study as there are no State Water Quality Standards for Total Cyanide. Limitations for Cyanide provided in CDPHE Water Quality Standards are based on Free Cyanide analysis. EPA Cyanide Clarification of Free and Total

Cyanide Analysis for Safe Drinking Water Act (SDWA) Compliance (August 2016) States the following: Total Cyanide methods are allowed for screening, the Maximum Contaminant Level (MCL)/Maximum Contaminant Level Goal (MCLG) applicable to free cyanide, as the Total Cyanide screening methods are easier, faster and cheaper than the Free Cyanide methods. During this Local Limits Study, Cyanide (total) was evaluated as a pollutant of concern based on free cyanide standards. A reasonable potential (RP) analysis has been performed during the Pollutants of Concern Evaluation resulting in the potential for Cyanide to be discharged in amounts that could cause exceedances of water quality standards or criteria, as such; a Local Limit has been developed.

Hexavalent Chromium: Plant removal efficiencies and State Water Quality Standards have remained consistent resulting in a similar MAHL as the previous 2009 Local Limits Study. The Local Limit for Chromium has been relaxed due to reduced loading from domestic and commercial sources, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

Lead: The Local Limit for Lead has been relaxed due to an increase in the MAHL resulting from an increase in the plant's removal efficiency, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

Mercury: Although the State Chronic Water Quality Standard has remained consistent and domestic and commercial loading has reduced; the MAHL for Mercury has decreased due to a lower calculated plant removal efficiency, as such; the Local Limit for Mercury has lowered.

Molybdenum: Although the MAIL has remained relatively consistent versus the 2009 study, the Local Limit for Molybdenum has been relaxed due to reduced loading from domestic and commercial sources, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

Nickel: The Local Limit for Nickel has been relaxed due to reduced loading from domestic and commercial sources, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

Selenium: The Local Limit for Selenium has been relaxed due to reduced loading from domestic and commercial sources, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

Silver: The Local Limit for Silver has been relaxed due to an increase in plant removal efficiencies, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

Zinc: The Local Limit for Zinc has been relaxed due to an increase in the MAHL resulting from a less stringent Water Quality Standards, an increase in the plant's removal efficiency, lower growth and expansion expectations, and lower total SIU discharge volumes from the volumes used in the 2009 Local Limits Study.

19.0 EPA REGION 8 LOCAL LIMITS DEVELOPMENT SPREADSHEET

EPA Region 8 has provided a spreadsheet in Microsoft Excel format to provide POTWs with established methods to calculate local limits. SPWRP completed the spreadsheet to verify the accuracy of calculations used throughout this study. The completed spreadsheet is included in Attachment I. The Link to the EPA Region 8 spreadsheet: https://www.epa.gov/sites/production/files/r8spreadsheet5-9-05ver1.xls

ATTACHMENT A

Influent Sampling Results

Only pollutants with sampling results above the method detection limit are shown

	Number of Sample Results > MDL	Average (mg/L)	Maximum (mg/L)	Total Samples	Adjusted Average (mg/L)	Method for < MDL
Aldrin	1	0.000022	0.000022	19	0.000002	1/2 MDL
Ammonia	1385	29.6	39.9	1385	29.6	
Aniline	1	0.0022	0.0022	19	0.00192	1/2 MDL
Antimony	9	0.0006	0.0009	19	0.00030	1/2 MDL
Arsenic	19	0.0019657	0.0179	19	0.0019657	
Benzene	2	0.0004	0.0006	19	0.00013	1/2 MDL
Bis(2-chloroethyl)ether	1	0.0017	0.0017	19	0.00038	1/2 MDL
Bis(2-ethylhexyl)phthalate	19	0.0110	0.0176	19	0.0110	
BOD	1392	266.3	693.0	1392	266.3	
Bromodichloromethane	10	0.0006	0.0009	19	0.00038	1/2 MDL
Butyl benzyl phthalate	11	0.0053	0.0156	19	0.00316	1/2 MDL
Cadmium	10	0.0003	0.0004	19	0.00015	1/2 MDL
CBOD	1391	223.0	581.2	1391	223.0	
Chloroform	19	0.0024	0.0042	19	0.0024	
Chromium	11	0.0058	0.0169	19	0.0034	1/2 MDL
Copper	19	0.0722	0.1070	19	0.0722	
Cyanide (total)	4	0.0043	0.0067	19	0.0021	1/2 MDL
Cyanide (WAD)	3	0.0043	0.0046	19	0.0019	1/2 MDL
Dibromochloromethane	4	0.0007	0.0009	19	0.0002	1/2 MDL
Diethyl phthalate	18	0.0034	0.0046	19	0.0032	1/2 MDL
Dimethyl phthalate	1	0.0005	0.0005	19	0.0003	1/2 MDL
Di-n-butyl phthalate	1	0.0028	0.0028	19	0.0005	1/2 MDL
Endosulfan-I	4	0.000037	0.000055	19	0.00001	1/2 MDL
Ethylbenzene	9	0.0010	0.0018	19	0.0005	1/2 MDL
Hexavalent Chromium	1	0.1200	0.1200	19	0.0087	1/2 MDL
Lead	19	0.0033	0.0063	19	0.0033	
m,p-Xylene	2	0.0021	0.0023	19	0.0004	1/2 MDL
Mercury	10	0.00009	0.00030	19	0.00005	1/2 MDL
Methylene chloride	7	0.0185	0.0729	19	0.0074	1/2 MDL
Molybdenum	19	0.0074	0.0183	19	0.0074	
Nickel	19	0.0060	0.0085	19	0.0060	
Nonylphenol	8	0.0033	0.0040	8	0.0033	
o-Xylene	2	0.0012	0.0012	19	0.0002	1/2 MDL
p-Dichlorobenzene	3	0.0004	0.0005	19	0.0002	1/2 MDL
Phenol	17	0.0071	0.0103	19	0.00639	1/2 MDL
Phenols (total)	13	0.0556	0.1100	19	0.0420	1/2 MDL
Phosphorus	943	5.4	8.9	943	5.4	
Selenium	19	0.0034	0.0051	19	0.0034	
Silver	19	0.0008	0.0034	19	0.0008	
Tetrachloroethylene	8	0.0032	0.0134	19	0.0014	1/2 MDL
Thallium	6	0.00002	0.00004	19	0.00001	1/2 MDL
Toluene	14	0.0019	0.0073	19	0.0019	1/2 MDL
Total Suspended Solids	1400	235.0	325.0	1400	235.0	
Xylene	2	0.0033	0.0034	19	0.0006	1/2 MDL
Zinc	19	0.1274	0.2670	19	0.1274	

Effluent Sampling Results

Only pollutants with sampling results above the method detection limit are shown

	Number of Sample Results > MDL	Average (mg/L)	Maximum (mg/L)	Total Samples	Adjusted Average (mg/L)	Method for < MDL
2,6-Dinitrotoluene	1	0.00066	0.00066	19	0.00026	1/2 MDL
Aluminum (TR)	8	0.03825	0.062	166	0.01018	1/2 MDL
Ammonia	1394	1.75	9.2	1394	1.75	
Antimony (TR)	8	0.00036	0.00065	193	0.000100	1/2 MDL
Arsenic (TR)	160	0.00042	0.0013	214	0.00034	1/2 MDL
Benzene	0	0	0	19	0	
Barium (TR)	176	0.01281	0.0228	176	0.01281	
Bromide	1	1.23	1.23	1393	0.191	MDL
Bromodichloromethane	1	0.001	0.001	19	0.00016	1/2 MDL
Cadmium TR	3	0.00022	0.00028	191	0.000022	1/2 MDL
CBOD	971	2.94	127	1393	2.66	MDL
Chloride	1396	108.68	193	1396	108.68	
Chloroform	10	0.00073	0.0022	19	0.00046	1/2 MDL
Chromium (TR)	161	0.00105	0.004	194	0.00088	1/2 MDL
Copper (TR)	194	0.00907	0.0145	194	0.00907	
Cyanide (total)	3	0.0043	0.0048	19	0.00194	1/2 MDL
Cyanide (WAD)	30	0.00404	0.008	215	0.00185	1/2 MDL
Di-n-butyl phthalate	1	0.00096	0.00096	19	0.00037	1/2 MDL
Endosulfan-I	8	0.000031	0.000059	19	0.00002	1/2 MDL
Fluoride	1325	0.68302	1.29	1388	0.65429	MDL
Hexavalent Chromium	1	0.01000	0.01000	19	0.00289	1/2 MDL
Iron (TR)	176	0.1374	0.251	176	0.1374	
Lead (TR)	88	0.00047	0.0021	193	0.000234	1/2 MDL
Manganese (TR)	175	0.02189	0.0503	175	0.02189	
Methylene chloride	1	0.0007	0.0007	19	0.00098	1/2 MDL
Mercury (total)	2	0.000022	0.000034	19	0.000006	1/2 MDL
Molybdenum (TR)	185	0.00644	0.0164	185	0.00644	
Nickel (TR)	189	0.00365	0.0111	193	0.00357	1/2 MDL
Nitrate	1399	14.97	23.7	1399	14.97	
Nitrite	1397	0.27	1.69	1399	0.27	
Nonylphenol	8	0.00088	0.0040	8	0.00088	
Phosphorus (total)	996	2.80	4.9	996	2.80	
Potassium (TR)	172	>2.5	>2.5	172	>2.5	
Selenium (TR)	151	0.001806	0.0041	195	0.00144	1/2 MDL
Silver (TR)	13	0.000240	0.00069	171	0.000063	1/2 MDL
Sulfate	1398	131.6480687	218	1398	131.64807	
Thallium (TR)	3	0.00024	0.00043	189	0.000032	1/2 MDL
Total Suspended Solids	563	2.22	8	1400	2.08	MDL
Uranium (TR)	198	0.00762	0.0322	197	0.00766	
Vanadium (TR)	119	0.00159	0.0040	163	0.00127	1/2 MDL
Zinc (TR)	190	0.02829	0.0564	190	0.02829	

ATTACHMENT B

Trucked and Hauled Septage Sampling Results

	Number of Sample Results > MDL	Average (mg/L)	Maximum (mg/L)	Total Samples	Adjusted Average (mg/L)	Method For < MDL
Arsenic (total)	41	0.029	0.350	45	0.026	1/2 MDL
Benzene	0	0	0	1	0	
BOD	5	6092	9730	5	6092	
Cadmium (total)	36	0.008	0.134	45	0.006	1/2 MDL
Chromium (total)	39	0.074	0.516	45	0.064	1/2 MDL
COD	5	34020	99200	5	34020	
Copper (total)	45	1.55	9.94	45	1.55	
Lead (total)	35	0.192	4.490	45	0.151	1/2 MDL
Mercury (total)	27	0.001	0.0032	45	0.001	1/2 MDL
Molybdenum (total)	30	0.036	0.218	44	0.025	1/2 MDL
Nickel (total)	37	0.071	0.538	45	0.058	1/2 MDL
Oil and Grease	44	129.5	628.0	44	129.5	
Phosphorus (total)	44	314.6	1260.0	44	314.6	
Selenium (total)	40	0.015	0.031	45	0.013	1/2 MDL
Silver (total)	17	0.005	0.025	45	0.0020	1/2 MDL
Total Suspended Solids	5	17860	47700	5	17860	
Zinc (total)	43	4.49	43.60	45	5.64	

ATTACHMENT C

Biosolids Sampling Results

	Units	Total Samples	Number of Sample Results > MDL	Average	Max
Aluminum	mg/kg	57	57	3633	6365
Antimony	mg/kg	57	57	1.44	2.20
Arsenic	mg/kg	57	57	1.81	2.70
Barium	mg/kg	57	57	405	556
Beryllium	mg/kg	57	37	0.14	0.30
Bis (2-Ethylhexyl) phthalate	mg/kg	5	5	12802	46700
Butyl benzyl phthalate	mg/kg	3	0	ND	0
Cadmium	mg/kg	57	57	1.57	2.00
Chromium	mg/kg	57	57	24.4	38.0
Copper	mg/kg	57	57	714	880
Cyanide	mg/kg	57	38	1.44	2.80
Dioxin (Total TCDD)	pg/g	5	3	11.5	25.0
Dioxin (2,3,7,8 TCDD)	pg/g	5	1	2.10	2.10
Endosulfan-I	ug/kg	3	0	ND	0
Gamma-BHC (Lindane)	mg/kg	2	1	20.6	20.6
Iron	mg/kg	57	57	21508	27928
Lead	mg/kg	57	57	21.4	33.3
Manganese	mg/kg	57	57	369.57	513
Mercury	mg/kg	57	57	0.22	0.69
Methylene Chloride	mg/kg	5	0	ND	0
Molybdenum	mg/kg	57	57	11.9	19.5
Nickel	mg/kg	57	57	15.2	20.8
PCB	mg/kg	3	0	ND	0
Phenols - Total	mg/kg	57	57	66.3	167.3
Phosphorus	Percent	57	57	2.44	2.85
Potassium	mg/kg	57	57	1550	2245
Selenium	mg/kg	57	57	17.2	24.9
Silver	mg/kg	57	57	6.01	9.60
Toluene	ug/kg	5	3	34.3	74.0
Thallium	mg/kg	57	5	0.12	0.20
Total Nitrogen (Kjeldahl)	Percent	57	57	6.25	8.42
Zinc	mg/kg	57	57	947.0	1202.0

ATTACHMENT D

Significant Industrial Users Sampling Results

Meadow Gold Dairies	Total Number of Samples	Number of Samples > MDL	Average mg/L	Maximum mg/L
Arsenic (As)	8	6	0.0013483	0.0044
Cadmium (Cd)	8	7	0.0007157	0.0011
Chromium (Cr)	8	8	0.03005	0.0515
Copper (Cu)	8	8	0.0452375	0.066
Hexavalent Chromium (Cr VI)	8	0	0	0
Lead (Pb)	8	8	0.0056375	0.0077
Mercury (Hg)	8	4	0.000225	0.00031
Molybdenum (Mo)	8	7	0.0062429	0.0133
Nickel (Ni)	8	7	0.0124429	0.0185
Selenium (Se)	8	6	0.0037333	0.0051
Silver (Ag)	8	0	0	0
Zinc (Zn)	8	8	0.28575	0.568
Service Uniform	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	7	7	0.0036143	0.0061
Benzene	21	1	0.003	0.003
BTEX	21	18	0.1411389	0.6663
Cadmium (Cd)	7	7	0.009	0.0243
Chromium (Cr)	7	7	0.0271286	0.0382
Copper (Cu)	23	23	0.286013	0.504
Hexavalent Chromium (Cr VI)	6	1	0.012	0.012
Lead (Pb)	23	23	0.0708783	0.16
Mercury (Hg)	7	4	0.0002425	0.0003
Molybdenum (Mo)	23	23	0.0489522	0.128
Nickel (Ni)	7	7	0.031	0.0436
Selenium (Se)	7	7	0.0032371	0.0075
Silver (Ag)	7	7	0.0011657	0.0017
Zinc (Zn)	20	20	0.9305	1.71
Viasystems Denver, Inc.	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	7	3	0.0006533	0.0007
Cadmium (Cd)	22	2	0.002005	0.0038
Chromium (Cr)	22	1	0.004	0.004
Copper (Cu)	22	22	0.3062273	1.1
Cyanide	23	5	0.17512	0.5
Hexavalent Chromium (Cr VI)	7	0	0	0
Lead (Pb)	22	18	0.0238228	0.176
Mercury (Hg)	7	0	0	0
Molybdenum (Mo)	7	3	0.0105667	0.0133
Nickel (Ni)	22	17	0.0190759	0.091
Selenium (Se)	7	0	0	0
Silver (Ag)	34	18	0.0024856	0.0096
Zinc (Zn)	22	13	0.0288115	0.116

Karcher North America	Total Number of Samples	Number of Samples > MDL	Average mg/L	Maximum mg/L
Arsenic (As)	12	12	0.002175	0.0046
Benzene	2	0	0	0
BTEX	2	0	0	0
Cadmium (Cd)	39	13	0.0080285	0.0283
Chromium (Cr)	39	26	0.0040808	0.0117
Copper (Cu)	39	39	0.0690077	0.325
Cyanide	38	7	0.0055557	0.0081
Hexavalent Chromium (Cr VI)	12	0	0	0
Lead (Pb)	38	28	0.0123664	0.075
Mercury (Hg)	12	1	0.0001	0.0001
Molybdenum (Mo)	12	11	0.0044909	0.0067
Nickel (Ni)	39	36	0.0125991	0.0959
Selenium (Se)	12	11	0.0020618	0.0035
Silver (Ag)	40	25	0.0143428	0.218
Zinc (Zn)	39	39	0.2249308	0.95
Unicircuit Inc.	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	8	6	0.0006583	0.0015
Benzene	1	0	0	0
BTEX	1	0	0	0
Cadmium (Cd)	53	3	0.002	0.0008933
Chromium (Cr)	53	7	0.0035714	0.007
Copper (Cu)	53	53	0.3154245	1.49
Cyanide	106	56	0.1008893	0.76
Hexavalent Chromium (Cr VI)	7	0	0	0
Lead (Pb)	53	46	0.1211761	0.364
Mercury (Hg)	7	0	0	0
Molybdenum (Mo)	7	3	0.0050333	0.0095
Nickel (Ni)	53	43	0.0933233	0.758
Selenium (Se)	7	1	0.0014	0.0014
Silver (Ag)	53	10	0.005092	0.0209
Zinc (Zn)	53	30	0.03805	0.15
Pioneer Metal Finishing	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	7	7	0.0262871	0.178
Benzene	1	0	0	0
BTEX	1	1	0.0024	0.0024
Cadmium (Cd)	21	8	0.0018425	0.0047
Chromium (Cr)	22	22	0.3203909	1.85
Copper (Cu)	21	8	0.0067125	0.0107
Cyanide	21	18	0.0506556	0.34
Hexavalent Chromium (Cr VI)	23	18	0.2757778	1.7
Lead (Pb)	28	2	0.003	0.0038
Mercury (Hg)	7	0	0	0
Molybdenum (Mo)	7	7	0.0095714	0.0165
Nickel (Ni)	21	1	0.0048	0.0048
Selenium (Se)	7	6	0.0021833	0.0031
Silver (Ag)	21	6	0.0005117	0.0012
Zinc (Zn)	21	11	0.0454364	0.0886

Preferred Medical Products, Inc	Total Number of Samples	Number of Samples > MDL	Average mg/L	Maximum mg/L
Arsenic (As)	14	12	0.0047325	0.0372
Benzene	1	0	0	0
BTEX	1	0	0	0
Cadmium (Cd)	45	8	0.00038	0.00069
Chromium (Cr)	45	43	0.2007093	1.65
Copper (Cu)	45	45	0.0799533	0.64
Cyanide	44	37	0.0178251	0.06
Hexavalent Chromium (Cr VI)	14	1	0.013	0.013
Lead (Pb)	44	24	0.0114079	0.0457
Mercury (Hg)	14	0	0	0
Molybdenum (Mo)	14	14	0.0081714	0.0188
Nickel (Ni)	45	40	0.0919225	0.821
Selenium (Se)	14	4	0.00153	0.0035
Silver (Ag)	45	17	0.0015347	0.0038
Zinc (Zn)	45	44	0.0729886	0.161
Breckenridge Brewery	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	5	4	0.0008375	0.0015
Cadmium (Cd)	5	3	0.0002633	0.00029
Chromium (Cr)	5	4	0.016375	0.0368
Copper (Cu)	5	5	0.0658	0.105
Hexavalent Chromium (Cr VI)	5	0	0	0
Lead (Pb)	5	1	0.001	0.001
Mercury (Hg)	5	0	0	0
Molybdenum (Mo)	5	3	0.0063	0.0084
Nickel (Ni)	5	3	0.0052333	0.0059
Selenium (Se)	5	4	0.001625	0.0022
Silver (Ag)	5	0	0	0
Zinc (Zn)	5	5	0.13612	0.19
Premier Coatings LLC	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	7	7	0.0115429	0.028
Benzene	1	0	0	0
BTEX	1	1	0.0888	0.0888
Cadmium (Cd)	22	14	0.0089393	0.0757
Chromium (Cr)	22	20	0.0349655	0.231
Copper (Cu)	23	23	0.1465435	0.799
Cyanide	22	5	0.02522	0.068
Hexavalent Chromium (Cr VI)	7	1	0.016	0.016
Lead (Pb)	22	17	0.0080933	0.0203
Mercury (Hg)	7	0	0	0
Molybdenum (Mo)	7	7	0.0142	0.0443
Nickel (Ni)	22	19	0.0180553	0.0574
Selenium (Se)	7	7	0.0036286	0.0055
Silver (Ag)	22	3	0.0006733	0.00074
Zinc (Zn)	30	30	0.6216667	3.89

Raritan CWT	Total Number of Samples	Number of Samples > MDL	Average mg/L	Maximum mg/L
Arsenic (As)	7	7	0.0134286	0.0639
Benzene	23	9	0.0034444	0.0117
BTEX	23	16	0.0449938	0.302
Cadmium (Cd)	7	3	0.0005167	0.00073
Chromium (Cr)	22	12	0.0084692	0.0315
Copper (Cu)	23	21	0.0430652	0.27
Hexavalent Chromium (Cr VI)	7	0	0	0
Lead (Pb)	22	19	0.01235	0.0801
Mercury (Hg)	7	0	0	0
Molybdenum (Mo)	7	7	0.2596143	1.63
Nickel (Ni)	7	5	0.01582	0.0208
Selenium (Se)	7	6	0.00882	0.0236
Silver (Ag)	7	0	0	0
Zinc (Zn)	22	20	0.2514715	0.789
Lockheed Martin Space Systems	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	24	9	0.0007533	0.001
Benzene	5	0	0	0
BTEX	5	0	0	0
Cadmium (Cd)	80	19	0.0010774	0.0043
Chromium (Cr)	80	18	0.0265278	0.092
Copper (Cu)	80	68	0.1476868	0.96
Cyanide	58	1	0.0054	0.0054
Hexavalent Chromium (Cr VI)	23	2	0.02952	0.059
Lead (Pb)	80	35	0.0028429	0.012
Mercury (Hg)	24	0	0	0
Molybdenum (Mo)	23	22	0.0143091	0.034
Nickel (Ni)	80	55	0.0174345	0.17
Selenium (Se)	24	5	0.03305	0.157
Silver (Ag)	80	8	0.0006438	0.0018
Zinc (Zn)	80	61	0.1633344	0.84
Mile High Powder Coating	**Total Number of Samples**	**Number of Samples > MDL**	**Average mg/L**	**Maximum mg/L**
Arsenic (As)	3	3	0.0037	0.0038
Benzene	1	0	0	0
BTEX	1	1	0.0834	0.0834
Cadmium (Cd)	4	2	0.00115	0.0012
Chromium (Cr)	4	2	0.0054	0.0054
Copper (Cu)	4	4	0.072225	0.124
Cyanide	4	0	0	0
Hexavalent Chromium (Cr VI)	3	0	0	0
Lead (Pb)	4	4	0.0773	0.136
Mercury (Hg)	2	0	0	0
Molybdenum (Mo)	2	2	0.04365	0.0633
Nickel (Ni)	4	4	0.009225	0.0124
Selenium (Se)	2	2	0.0018	0.0019
Silver (Ag)	4	0	0	0
Zinc (Zn)	4	4	0.51325	0.938

Closed County Line Landfill	Total Number of Samples	Number of Samples > MDL	Average mg/L	Maximum mg/L
Arsenic (As)	6	2	0.0031	0.0051
Benzene	1	0	0	0
BTEX	1	0	0	0
Cadmium (Cd)	6	1	0.00021	0.00021
Chromium (Cr)	6	0	0	0
Copper (Cu)	6	0	0	0
Hexavalent Chromium (Cr VI)	6	0	0	0
Lead (Pb)	6	1	0.0037	0.0037
Mercury (Hg)	6	0	0	0
Molybdenum (Mo)	6	5	0.0039	0.005
Nickel (Ni)	6	1	0.0044	0.0044
Selenium (Se)	6	0	0	0
Silver (Ag)	6	5	0.00138	0.002
Zinc (Zn)	6	3	0.0090333	0.011

ATTACHMENT E

Commercial Sampling Results

	Number of Sample Results > MDL	Average (mg/L)	Maximum (mg/L)	Total Samples	Adjusted Average (mg/L)	Method For < MDL
Arsenic, Total	34	0.0015	0.0059	35	0.0015	1/2 MDL
Benzene	0	0	0	4	0	
Cadmium, Total	24	0.0014	0.0036	35	0.0010	1/2 MDL
Chromium, Total	19	0.0134	0.0300	35	0.0073	1/2 MDL
Hexavalent Chromium	1	0.0270	0.0270	35	0.0032	1/2 MDL
Copper, Total	35	0.1414	0.4520	35	0.1414	
Lead, Total	35	0.0300	0.0782	35	0.0300	
Mercury, Total	9	0.00034	0.00078	35	0.00011	1/2 MDL
Molybdenum, Total	35	0.0144	0.0567	35	0.0144	
Nickel, Total	35	0.0246	0.0601	35	0.0246	
Selenium, Total	22	0.0032	0.0056	35	0.0021	1/2 MDL
Silver, Total	30	0.0035	0.0172	35	0.0031	1/2 MDL
Zinc, Total	35	0.2897	0.8210	35	0.2897	
Cyanide, Total	9	0.0111	0.0210	33	0.0041	1/2 MDL
Cyanide, WAC	2	0.0067	0.0075	33	0.0018	1/2 MDL
Phosphorus, Total	35	6.57	15.40	35	6.57	
BOD	14	259.2	558.0	14	259.2	
COD	14	582.3	852.0	14	582.3	
TSS	14	165.5	354.0	14	165.5	
Phenols, Total	4	0.0430	0.0630	6	0.0328	1/2 MDL
HEM O&G	4	24.93	43.80	4	24.93	
HEM-SGT	3	16.42	20.60	4	12.91	1/2 MDL
Bis(2-Ethylhexyl)phthalate	4	0.0311	0.0632	4	0.0311	
Bromodichloromethane	3	0.0012	0.0018	4	0.0010	1/2 MDL
Butyl benzyl phthalate	1	0.0027	0.0027	4	0.0009	1/2 MDL
Chloroform	4	0.0104	0.0168	4	0.0104	
Di-n-butyl-phthalate	1	0.0025	0.0025	4	0.0013	1/2 MDL
Dibromochloromethane	1	0.0015	0.0015	4	0.0006	1/2 MDL
Diethyl phthalate	4	0.0035	0.0052	4	0.0035	
Endosulfan-I	0	0	0	4	0	
Ethylbenzene	2	0.0021	0.0036	4	0.0012	1/2 MDL
Naphthalene	1	0.0012	0.0012	4	0.0010	1/2 MDL
p-Dichlorobenzene	2	0.0020	0.0021	4	0.0012	1/2 MDL
Phenanthrene	1	0.00057	0.00095	4	0.00086	1/2 MDL
Phenol	4	0.0143	0.0352	4	0.0143	
Tetrachloroethylene	2	0.0035	0.0036	4	0.0019	1/2 MDL
Toluene	4	0.0277	0.0949	4	0.0277	
Xylene	2	0.0162	0.0277	4	0.0084	1/2 MDL

Residential Sampling Results

	Number of Sample Results > MDL	Average (mg/L)	Maximum (mg/L)	Total Samples	Adjusted Average mg/L	Method for < MDL
Arsenic, Total	31	0.0012	0.0053	36	0.0010	1/2 MDL
Benzene	0	0	0	4	0	
Cadmium, Total	17	0.0006	0.0021	36	0.0003	1/2 MDL
Chromium, Total	4	0.0136	0.0212	36	0.0016	1/2 MDL
Hexavalent Chromium	1	0.0110	0.0110	36	0.0027	1/2 MDL
Copper, Total	36	0.0590	0.1550	36	0.0590	
Lead, Total	23	0.0112	0.0846	36	0.0072	1/2 MDL
Mercury, Total	1	0.00024	0.00082	36	0.00003	1/2 MDL
Molybdenum, Total	34	0.0073	0.0375	36	0.0069	1/2 MDL
Nickel, Total	22	0.0071	0.0308	36	0.0044	1/2 MDL
Selenium, Total	22	0.0030	0.0056	36	0.0019	1/2 MDL
Silver, Total	18	0.00048	0.00130	36	0.00024	1/2 MDL
Zinc, Total	36	0.1515	0.6040	36	0.1515	
Cyanide, Total	0	0	0	35	0.00000	
Cyanide, WAC	0	0	0	34	0.00000	
Phosphorus, Total	36	5.02	8.6	36	5.02	
BOD	14	218.7	774	14	218.7	
COD	14	475.1	1710	14	475.1	
TSS	14	205.1	452	14	205.1	
Phenol, Total	6	0.0400	0.055	6	0.0400	
HEM O&G	4	12.17	19.575	4	12.17	
HEM-SGT	0	0	0	4	0	
Bis(2-Ethylhexyl)phthalate	4	0.0105	0.0125	4	0.0105	
Chloroform	3	0.0021	0.0025	4	0.0017	1/2 MDL
Dibromochloromethane	1	0.0008	0.0008	4	0.0004	1/2 MDL
Diethyl phthalate	4	0.0030	0.0054	4	0.0030	
Endosulfan-I	0	0	0	4	0	
Phenol	4	0.0033	0.0054	4	0.0033	
Toluene	3	0.0007	0.0008	4	0.0006	1/2 MDL

ATTACHMENT F

Receiving Stream (Upstream) Sampling Results

	Number of Sample Results > RL	Average (mg/L)	Maximum (mg/L)	Total Samples
Aluminum, Total	78	0.4606	2.180	79
Antimony, Total	3	0.0006	0.0006	86
Ammonia	74	0.0849	0.4800	90
Arsenic, Total	71	0.1718	0.9900	87
Barium, Total	87	15.0	87.3	87
Bromide	0	0	0	91
Cadmium, Total	0	0	0	87
CBOD	38	2.82	9.0	91
Chloride	90	97.5	388.0	91
Chromium, Total	64	0.0013	0.0040	86
Copper, Total	8	0.0087	0.0217	86
Fluoride	88	0.7383	1.1100	89
Iron, Total	61	0.6084	2.3000	61
Lead, Total	71	0.0008	0.0030	82
Manganese, Total	25	0.1264	0.2000	86
Molybdenum, Total	81	0.0037	0.0109	81
Nickel, Total	85	0.0016	0.0035	85
Nitrate	71	1.68	5.22	91
Nitrite	6	0.17	0.32	91
Phosphorus, Total	88	0.098	0.570	88
Potassium, Total	15	3.3887	5.1400	83
Selenium, Total	63	0.0020	0.0044	88
Silver, Total	1	0.0005	0.0005	71
Sulfate	91	93.3	219.0	91
Thallium, Total	3	0.0005	0.0006	82
Total Suspended Solids	91	17.7	59.0	91
Uranium, Total	86	0.0118	0.0381	86
Vanadium, Total	62	0.0018	0.0053	81
Zinc, Total	34	0.0153	0.0896	86

ATTACHMENT G

Environmental Criteria – Acute

	CAS Number	State Aquatic Life Acute (1) mg/L	EPA Aquatic Life Acute (2) mg/L	State Stream Segment Specific WQS Acute (3) mg/L	NPDES Permit Acute (4) mg/L	Drinking Water Supply Acute (5) mg/L
2,6-Dinitrotoluene	606-20-2	0.33	-	-	-	-
Aldrin	309-00-2	0.0015	0.003	-	-	-
Aluminum **(8)**	7429-90-5	10.07 (TVS)(D)	0.75 (T)	-	-	-
Ammonia - January	7664-41-7	Variable	Variable	-	19	-
Ammonia - February	7664-41-7	Variable	Variable	-	15	-
Ammonia - March	7664-41-7	Variable	Variable	-	14	-
Ammonia - April	7664-41-7	Variable	Variable	-	14	-
Ammonia - May	7664-41-7	Variable	Variable	-	19	-
Ammonia - June	7664-41-7	Variable	Variable	-	23	-
Ammonia - July	7664-41-7	Variable	Variable	-	29	-
Ammonia - August	7664-41-7	Variable	Variable	-	28	-
Ammonia - September	7664-41-7	Variable	Variable	-	19	-
Ammonia - October	7664-41-7	Variable	Variable	-	16	-
Ammonia - November	7664-41-7	Variable	Variable	-	16	-
Ammonia - December	7664-41-7	Variable	Variable	-	16	-
Aniline	62-53-3	-	-	-	-	-
Antimony	7440-36-0	-	-	-	-	-
Arsenic	7440-38-2	0.340 (D)	0.34 (D)	0.340 (D)	Report	-
Barium	7440-39-3	-	-	-	-	1.0 (T)
Benzene	71-43-2	5.300	-	-	-	-
Berylium	7440-41-7	-	-	-	-	-
Bis(2-chloroethyl)ether	111-44-4	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	117-81-7	-	-	-	-	-
BOD		-	-	-	-	-
Bromodichloromethane	75-27-4	11.0	-	-	-	-
Bromide	7726-95-6	-	-	-	-	-
Butyl benzyl phthalate	85-68-7	-	-	-	-	-
Cadmium	7440-43-9	0.0068 (TVS) (D)	0.0048 (TVS) (D)	0.0068 (TVS) (D)	Report	0.005 (T)
CBOD		-	-	-	40 (7-day)	-
Chloride	16887-00-6	-	860	-	-	-
Chloroform	67-66-3	28.9	-	-	-	-
Chromium (Total) **(9)**	7440-47-3	1.347 (TVS) (D)	1.347 (TVS) (D)	0.05 (T)	Report	0.05 (T)
Copper	7440-50-8	0.0362 (TVS) (D)	0.0362 (TVS) (D)	0.0315 (D)	Report	-
Cyanide **(6)**	57-12-5	0.005 (F)	0.022 (F)	0.005 (F)	Report	0.2 (F)
Dibromochloromethane	124-48-1	-	-	-	-	-
Diethyl phthalate	84-66-2	-	-	-	-	-
Dimethyl phthalate	131-11-3	-	-	-	-	-
Di-n-butyl phthalate	84-74-2	-	-	-	-	-
Endosulfan-I	959-98-8	0.00011	0.00022	-	-	-
Ethylbenzene	100-41-4	32	-	-	-	-
Flouride	16984-48-8	-	-	-	-	2.0
Gamma-BHC (Lindane)	58-89-9	0.00095	0.00095	-	-	-
Hexavalent Chromium	18540-29-9	0.016 (D)	0.016 (D)	0.016 (D)	-	0.05 (T)
Iron	7439-89-6	-	-	-	-	-

	CAS Number	State Aquatic Life Acute (1) mg/L	EPA Aquatic Life Acute (2) mg/L	State Stream Segment Specific WQS Acute (3) mg/L	NPDES Permit Acute (4) mg/L	Drinking Water Supply Acute (5) mg/L
Lead	7439-92-1	0.198 (TVS) (D)	0.198 (TVS) (D)	0.198 (TVS) (D)	Report	0.05 (T)
Manganese	7439-96-5	4.237(TVS) (D)	-	4.237(TVS) (D)	Report	-
Manganese (total)	7439-96-5	-	-	-	-	-
m,p-Xylene	179601-23-1	-	-	-	-	-
Mercury	7439-97-6	-	0.0014 (D)	-	Report	0.002 (T)
Methylene chloride	75-09-2	-	-	-	-	-
Molybdenum	7439-98-7	-	-	-	Report	-
Nickel	7440-02-0	1.139 (TVS) (D)	1.139 (TVS) (D)	1.139 (TVS) (D)	Report	-
Nitrate	14797-55-8	-	-	10	-	10
Nitrite	14797-65-0	-	-	-	-	1.0
Nonylphenol	84852-15-3	0.028	0.028	-	Report	-
o-Xylene	95-47-6	-	-	-	-	-
Oil and Grease		-	-	-	10	-
p-Dichlorobenzene	106-46-7	-	-	-	-	-
Phenol	108-95-2	10.2	-	-	-	-
Phenols (total phenolics)	10045	-	-	-	Report	-
Phosphorus (total) **(7)**	7723-14-0	-	-	-	-	-
Potassium	9440-09-7	-	-	-	-	-
Selenium	7782-49-2	0.0184 (D)	-	-	Report	-
Silver	7440-22-4	0.0124 (TVS) (D)	0.0196 (TVS) (D)	0.0124 (TVS) (D)	Report	0.1 (T)
Sulfate	18785-72-3	-	-	-	-	-
Tetrachloroethylene	127-18-4	5.28	-	-	-	-
Thallium (total)	7440-28-0	-	-	-	-	-
Total Inorganic Nitrogen - January	7727-37-9	-	-	-	23.4	-
Total Inorganic Nitrogen - February	7727-37-9	-	-	-	23.2	-
Total Inorganic Nitrogen - March	7727-37-9	-	-	-	22.6	-
Total Inorganic Nitrogen - April	7727-37-9	-	-	-	24.7	-
Total Inorganic Nitrogen - May	7727-37-9	-	-	-	36.3	-
Total Inorganic Nitrogen - June	7727-37-9	-	-	-	39.1	-
Total Inorganic Nitrogen - July	7727-37-9	-	-	-	36.9	-
Total Inorganic Nitrogen - August	7727-37-9	-	-	-	39.9	-
Total Inorganic Nitrogen - September	7727-37-9	-	-	-	32.6	-
Total Inorganic Nitrogen - October	7727-37-9	-	-	-	29.4	-
Total Inorganic Nitrogen - November	7727-37-9	-	-	-	25.7	-
Total Inorganic Nitrogen - December	7727-37-9	-	-	-	26.5	-
Toluene	108-88-3	17.5	-	-	-	-
Total Suspended Solids		-	-	-	45 (7-day)	-
Uranium	7440-61-1	7.64 (TVS) (D)	-	-	-	-
Vanadium	7440-62-2	-	-	-	-	-
Xylene (total)	1330-20-7	-	-	-	-	-
Zinc	7440-66-6	0.416 (TVS) (D)	0.285 (TVS) (D)	0.416 (TVS) (D)	Report	-

Abbreviations: (D) - Dissolved, TVS - Table Value Standard based on Receiving Stream Hardness of 286 mg/L as CaCO3, (F) - Free Cyanide Concentration.

(1) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, The Basic Standards and Methodologies For Surface Water - Aquatic Life Based Criteria.

(2) EPA National Recommended Water Quality Criteria - Aquatic Life Criteria Table. Last Update on October 20, 2016

(3) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 38, Classification and Numeric Standards for South Platte River Basin (COSPUS14), Laramie River Basin Republican River Basin, Smoky Hill River Basin.

(4) Colorado Discharge Permit System, permit Number CO032999, Numeric Limitation.
(5) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, The Basic Standards and Methodologies For Surface Water - Domestic Water Supply Criteria.
(6) Standards based on available free cyanide, Weak Acid Dissociable (WAD) method for analysis measures Free Cyanide in addition to weak and Moderately Strong Metal-Cyanide complexes.
(7) Total Phosphorus: Current Permit has a report only requirement for total phosphorus with compliance schedule for treatment plant improvements to achieve limitations per CDPHE Regulation 85 by July 1, 2023. Beginning July 1, 2023 discharge permit effluent limitations for Total Phosphorus will be 2.5 mg/L limit as the 95% of all samples taken in the most recent 12 calendar months.
(8) TVS for Aluminum based on hardness value of 220 per Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31.
(9) Criteria for Chromium (total) based on Chromium III Standards.

ATTACHMENT H

Environmental Criteria - Chronic

	CAS Number	State Aquatic Life Chronic (1) mg/L	EPA Aquatic Life Chronic (2) mg/L	State Human Health Chronic (3) mg/L	EPA Human Health Chronic (4) mg/L	State Stream Segment Specific WQS Chronic (5)	NPDES Permit Chronic (6) mg/L	State Agriculture Chronic (7) mg/L	Drinking Water Supply Chronic (8) mg/L
2,6-Dinitrotoluene	606-20-2	0.23	-	-	-	-	-	-	-
Aldrin	309-00-2	-	-	0.00000049	0.00000077	-	-	-	0.0000021
Aluminum **(11)**	7429-90-5	1.437 (T)	-	-	-	-	-	-	-
Ammonia - January	7664-41-7	Variable	Variable	-	-	-	7.6	-	-
Ammonia - February	7664-41-7	Variable	Variable	-	-	-	6.5	-	-
Ammonia - March	7664-41-7	Variable	Variable	-	-	-	6.2	-	-
Ammonia - April	7664-41-7	Variable	Variable	-	-	-	5.3	-	-
Ammonia - May	7664-41-7	Variable	Variable	-	-	-	4.5	-	-
Ammonia - June	7664-41-7	Variable	Variable	-	-	-	4.3	-	-
Ammonia - July	7664-41-7	Variable	Variable	-	-	-	3.8	-	-
Ammonia - August	7664-41-7	Variable	Variable	-	-	-	3.3	-	-
Ammonia - September	7664-41-7	Variable	Variable	-	-	-	3.3	-	-
Ammonia - October	7664-41-7	Variable	Variable	-	-	-	4.1	-	-
Ammonia - November	7664-41-7	Variable	Variable	-	-	-	5.3	-	-
Ammonia - December	7664-41-7	Variable	Variable	-	-	-	6.4	-	-
Aniline	62-53-3	-	-	-	-	-	-	-	0.0061
Antimony	7440-36-0	-	-	0.0056 (T)	0.0056	-	-	-	0.006 (T)
Arsenic	7440-38-2	0.150 (D)	0.15 (D)	0.00002 (T)	0.000018 (T)	0.00002 (T)	Report	0.1 (T)	0.00002 (T)
Barium	7440-39-3	-	-	-	1.0	-	-	-	0.49 (T)
Benzene	71-43-2	-	-	0.0022	0.0021	-	-	-	0.0023
Berylium	7440-41-7	-	-	-	-	-	-	0.1 (T)	0.004 (T)
Bis(2-chloroethyl)ether	111-44-4	-	-	0.00003	0.00003	-	-	-	0.000032
Bis(2-ethylhexyl)phthalate	117-81-7	-	-	0.0012	0.00032	-	-	-	0.0025
BOD		-	-	-	-	-	-	-	-
Bromodichloromethane	75-27-4	-	-	0.00055	0.00095	-	-	-	-
Bromide	7726-95-6	-	-	-	-	-	-	-	-
Butyl benzyl phthalate	85-68-7	-	-	1.4	1.0	-	-	-	1.4
Cadmium	7440-43-9	0.00094 (TVS) (D)	0.00158 (TVS) (D)	-	-	0.00094 (TVS) (D)	Report	0.01 (T)	-
Cadmium (total)	7440-43-9	-	-	-	-	-	-	-	-
CBOD		-	-	-	-	-	25 (30-day)	-	-
Chloride	16887-00-6	-	230	-	-	250	Report	-	250

	CAS Number	State Aquatic Life Chronic (1) mg/L	EPA Aquatic Life Chronic (2) mg/L	State Human Health Chronic (3) mg/L	EPA Human Health Chronic (4) mg/L	State Stream Segment Specific WQS Chronic (5)	NPDES Permit Chronic (6) mg/L	State Agriculture Chronic (7) mg/L	Drinking Water Supply Chronic (8) mg/L
Chloroform	67-66-3	1.24	-	0.0034	0.06	-	Report	-	-
Chromium	7440-47-3	0.175 (TVS) (D)	0.175 (TVS) (D)	-	-	0.175 (TVS) (D)	-	0.1 (T)	-
Copper	7440-50-8	0.022 (TVS) (D)	0.0220 (TVS) (D)	1.3 (T)	1.3 (T)	0.0208 (D)	Report	0.2 (T)	1.0 (T)
Cyanide **(9)**	57-12-5	-	0.0052 (F)	-	0.004	-	-	-	-
Dibromochloromethane	124-48-1	-	-	0.054	0.0008	-	-	-	-
Diethyl phthalate	84-66-2	-	-	5.6	0.6	-	-	-	5.6
Dimethyl phthalate	131-11-3	70	-	-	-	-	-	-	70
Di-n-butyl phthalate	84-74-2	-	-	0.7	0.02	-	-	-	0.7
Endosulfan-I	959-98-8	0.000056	0.000056	-	0.02	-	-	-	0.042
Ethylbenzene	100-41-4	-	-	0.53	0.068	-	-	-	0.7
Flouride	16984-48-8	-	-	-	-	-	-	-	-
Gamma-BHC (Lindane)	58-89-9	0.00008	-	0.0002	0.0042	-	-	-	0.0002
Hexavalent Chromium	18540-29-9	0.011 (D)	0.011 (D)	0.1 (T)	-	-	Report	0.1 (T)	-
Iron	7439-89-6	1.0 (T)	1.0 (D)	-	-	1.0 (T)	-	-	0.3 (D)
Lead	7439-92-1	0.0077 (TVS) (D)	0.0077 (TVS) (D)	-	-	0.0077 (TVS) (D)	-	0.1 (T)	-
Manganese	7439-96-5	2.341 (TVS) (D)	-	-	0.05	0.19 (D)	Report	0.2 (T)	0.05 (D)
m,p-Xylene	179601-23-1	-	-	-	-	-	-	-	-
Mercury	7439-97-6	0.00001 (T)	0.00077 (D)	-	-	0.00001 (T)	Report	-	-
Methylene chloride	75-09-2	-	-	0.0046	0.02	-	-	-	0.005
Molybdenum	7439-98-7	-	-	-	-	0.15 (T)	-	0.3 (T)	0.21 (T)
Nickel	7440-02-0	0.1265 (TVS) (D)	0.1265 (TVS) (D)	0.61 (T)	0.61 (T)	0.1265 (TVS) (D)	-	0.2 (T)	0.1 (T)
Nitrate	14797-55-8	-	-	-	10	-	-	-	-
Nitrite	14797-65-0	-	-	-	-	0.5	-	-	-
Nonylphenol	84852-15-3	0.0066	0.0066	-	-	-	Report	-	-
o-Xylene	95-47-6	-	-	-	-	-	-	-	-
Oil and Grease		-	-	-	-	-	-	-	-
p-Dichlorobenzene	106-46-7	-	-	0.063	0.3	-	-	-	0.075
Phenol	108-95-2	2.56	-	2.1	4.0	-	-	-	2.1
Phenols (total phenolics)	10045	-	-	-	-	-	-	-	-
Phosphorus (total) **(10)**	7723-14-0	-	-	-	-	-	-	-	-
Potassium	9440-09-7	-	-	-	-	-	-	-	-
Selenium	7782-49-2	0.0046 (D)	0.0031 (D) (12)	0.17 (T)	0.17 (T)	-	Report	0.02 (T)	0.05 (T)
Silver	7440-22-4	0.002 (TVS) (D)	-	-	-	0.002 (TVS) (D)	-	-	-
Sulfate	18785-72-3	-	-	-	-	-	Report	-	250
Tetrachloroethylene	127-18-4	0.84	-	0.005	0.01	-	-	-	0.005

	CAS Number	State Aquatic Life Chronic (1) mg/L	EPA Aquatic Life Chronic (2) mg/L	State Human Health Chronic (3) mg/L	EPA Human Health Chronic (4) mg/L	State Stream Segment Specific WQS Chronic (5)	NPDES Permit Chronic (6) mg/L	State Agriculture Chronic (7) mg/L	Drinking Water Supply Chronic (8) mg/L
Thallium	7440-28-0	0.015 (D)	-	0.00024 (T)	0.00024 (T)	-	-	-	0.0005 (T)
Toluene	108-88-3	-	-	0.51	0.057	-	-	-	0.56
Total Inorganic Nitrogen	7727-37-9	-	-	-	-	-	-	-	-
Total Suspended Solids		-	-	-	-	-	30 (30-day)	-	-
Uranium	7440-61-1	4.77 (TVS) (D)	-	-	-	-	0.03 (30-day)	-	0.0168 (T)
Vanadium	7440-62-2	-	-	-	-	-	-	-	-
Xylene (total)	1330-20-7	-	-	-	-	-	-	-	1.4
Zinc	7440-66-6	0.315 (TVS) (D)	0.288 (TVS) (D)	7.4 (T)	7.4 (T)	0.315 (TVS) (D)	-	2.0 (T)	5.0 (T)

Abbreviations: (D) - Dissolved, (TVS) - Table Value Standard based on Receiving Stream Hardness of 286 mg/L as CaCO3, (F) - Free Cyanide Concentration.

(1) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, The Basic Standards and Methodologies For Surface Water - Aquatic Life Based Criteria.
(2) EPA National Recommended Water Quality Criteria - Aquatic Life Criteria Table. Last Update on October 20, 2016.
(3) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, The Basic Standards and Methodologies For Surface Water - Human Health Based Criteria.
(4) EPA National Recommended Water Quality Criteria - Human Health Criteria Table. Last Update on July 29, 2016.
(5) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 38, Classification and Numeric Standards for South Platte River Basin (COSPUS14), Laramie River Basin Republican River Basin, Smoky Hill River Basin.
(6) Colorado Discharge Permit System, permit Number CO032999, Numeric Limitation.
(7) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, The Basic Standards and Methodologies For Surface Water - Agriculture Criteria.
(8) Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31, The Basic Standards and Methodologies For Surface Water - Domestic Water Supply Criteria.
(9) Standards based on available free cyanide, Weak Acid Dissociable (WAD) method for analysis measures Free Cyanide in addition to weak and Moderately Strong Metal-Cyanide complexes.
(10) Total Phosphorus: Current Permit has a report only requirement for total phosphorus with compliance schedule for treatment plant improvements to achieve limitations per CDPHE Regulation 85 by July 1, 2023. Beginning July 1, 2023 discharge permit effluent limitations for Total Phosphorus will be 1.0 mg/L running annual median.
(11) TVS for Aluminum based on hardness value of 220 per Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation No. 31.
(12) EPA Chronic Aquatic Life criteria from EPA Aquatic Life Ambient Water Quality Criterion for Selenium - Freshwater, 2016

ATTACHMENT I

EPA Local Limits Spreadsheet

TABLE 1 - GENERAL DATA ENTRY

POTW NAME:	SOUTH PLATTE WATER RENEWAL PARTNERS	
POTW HIGHEST MONTHLY AVERAGE FLOW **(MGD)**:	30.7	
DOMESTIC FLOW (**MGD**):	19.24	
SIU FLOW **(MGD)**:	1.05066	
COMMERCIAL FLOW **(MGD)**:	10.36	
TRUCKED AND HAULED WASTE FLOW **(MGD)**:	0.0451	
COMMERCIAL FLOW AS A % OF ALL NON-DOMESTIC	91	
TOTAL **COMMERCIAL** FLOW AS A % OF TOTAL POTW FLOW	34	
TOTAL NON-DOMESTIC FLOW AS A % OF TOTAL POTW FLOW	37	
SPECIFIC GRAVITY OF SLUDGE TO DISPOSAL (kg/l)	1.06	
SLUDGE FLOW TO DISPOSAL **(MGD)**:	0.142	
% SOLIDS TO DISPOSAL **(%)**	18.4	
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)**:	100	
SITE LIFE **(YEARS)**:	100	
CHRONIC RECEIVING WATER FLOW **(MGD)**:	15.51	
ACUTE RECEIVING WATER FLOW **(MGD)**:	10.34	
HARDNESS FOR METALS CALCULATIONS **(MG/L)**:	286	
IS YOUR RECEIVING WATER A DRINKING WATER SUPPLY **(Y/N)**?:	Y	
APPLICABLE STANDARDS (ACUTE, CHRONIC, BOTH):	B	**A,C OR B**

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**	Drinking Water Supply MCLs MG/L	STATE RECEIVING STREAM WQS MG/L
ARSENIC		0.368	0.368	**0.3680**		0.368
BENZENE		5.3		**5.3000**		
CADMIUM		0.0075	0.0053	**0.0075**	0.005	0.0075
CHROMIUM		1.836	1.8360	**1.8360**	0.05	0.05
COPPER		0.0437	0.0437	**0.0437**		0.038
CYANIDE		0.005	0.0220	**0.0050**	0.2	0.005
CHROMIUM (VI)		0.0163	0.0163	**0.0163**	0.05	0.0163
LEAD		0.2487	0.2487	**0.2487**	0.05	0.2487
MERCURY			0.0016	**0.0016**	0.002	
MOLYBDENUM						
NICKEL		1.217	1.217	**1.2170**		1.217
SELENIUM		0.0195		**0.0195**		0.0195
SILVER		0.0143	0.0225	**0.0143**	0.1	0.0143
ZINC		0.4405	0.3018	**0.4405**		0.4405

Monthly TABLE 3: CRITERIA AND STANDARDS POLLUTANT	Monthly NPDES PERMIT LIMITS MG/L	**RECEIVING STREAM OR STATE CHRONIC** WATER QUALITY CRITERIA MG/L	**EPA CHRONIC** WATER QUALITY CRITERIA MG/L	**FINAL CHRONIC** CRITERIA MG/L	**STATE** Human Health Criteria MG/L	**EPA** Human Health Criteria MG/L	**Final** Human Health Criteria MG/L	**OTHER CRITERIA** State Chronic Agriculture or MCL
ARSENIC		0.17715	0.17715	0.1772	0.00002		0.00002	0.1
BENZENE					0.0022	0.0021	0.0022	
CADMIUM		0.0010669	0.0017933	0.0011				0.01
CHROMIUM		0.224	0.2240	0.2240				0.1
COPPER		0.0250016	0.026444	0.0250	1.3	1.3	1.3	0.2
CYANIDE			0.0052	0.0052				
CHROMIUM (VI)		0.011418	0.0114	0.0114	0.1		0.1	0.1
LEAD		0.009756	0.009756	0.0098				0.1
MERCURY		0.00001	0.00077	0.00001				
MOLYBDENUM		0.15		0.1500				0.3
NICKEL		0.134596	0.134596	0.1346	0.61	0.61	0.61	0.1
SELENIUM		0.0048852	0.0032922	0.0049	0.17	0.17	0.17	0.02
SILVER		0.002		0.0020				
ZINC		0.32634	0.298368	0.3263	7.4	7.4	7.4	2

TABLE 4: INFLUENT AND EFFLUENT DATA	AVERAGE POTW **INFLUENT** MG/L	POTW FLOW MGD	POTW INFLUENT LBS/DAY	AVERAGE POTW **EFFLUENT** MG/L	POTW FLOW MGD	POTW EFFLUENT LBS/DAY	
POLLUTANT							POLLUTANT
ARSENIC	0.001966	21.94	0.359699372	0.000339	21.94	0.062054026	ARSENIC
BENZENE	0.000128	21.94	0.023498433	0.000000	21.94	0	BENZENE
CADMIUM	0.000154	21.94	0.028198119	0.000022	21.94	0.004083032	CADMIUM
CHROMIUM	0.003380	21.94	0.61850957	0.000876	21.94	0.16024014	CHROMIUM
COPPER	0.072168	21.94	13.20534882	0.009072	21.94	1.660021113	COPPER
CYANIDE	0.002089	21.94	0.382331059	0.001942	21.94	0.355365644	CYANIDE
CHROMIUM (VI)	0.008684	21.94	1.589033368	0.002895	21.94	0.529677789	CHROMIUM (VI)
LEAD	0.003258	21.94	0.596128276	0.000234	21.94	0.042779303	LEAD
MERCURY	0.000048	21.94	0.008691531	0.000006	21.94	0.001160476	MERCURY
MOLYBDENUM	0.007405	21.94	1.355012091	0.006441	21.94	1.178616112	MOLYBDENUM
NICKEL	0.006005	21.94	1.098840651	0.003575	21.94	0.654088549	NICKEL
SELENIUM	0.003395	21.94	0.621167589	0.001443	21.94	0.264128707	SELENIUM
SILVER	0.000763	21.94	0.139536391	0.000063	21.94	0.011583358	SILVER
ZINC	0.127368	21.94	23.30582274	0.028293	21.94	5.177070714	ZINC

TABLE 5: POLLUTANT LOADING AND RECEIVING WATER POLLUTANT	DOMESTIC CONTRIBUTION TO POTW MG/L	FINAL CALCULATED DOMESTIC CONTRIBUTION LBS/DAY	COMMERCIAL USER DISCHARGE TO POTW MG/L	CALCULATED COMMERCIAL CONTRIBUTION LBS/DAY	TOTAL DOMESTIC PLUS COMMERCIAL LOADING LBS/DAY	USER ENTERED TRUCKED AND HAULED WASTE LOADING TO POTW LBS/DAY	UPSTREAM RECEIVING WATER MG/L
ARSENIC	0.00103	0.1645	0.00148	0.1278	0.2923	0.009941439	0.171814225
BENZENE	0.00000	0.0000	0.00000	0.0000	0.0000	0	0
CADMIUM	0.00032	0.0517	0.00095	0.0822	0.1339	0.002391694	0
CHROMIUM	0.00155	0.2491	0.00728	0.6289	0.8780	0.024050994	0.00134875
COPPER	0.05899	9.4663	0.14140	12.2171	21.6834	0.581682037	0.0087
CYANIDE	0.00000	0.0000	0.00412	0.3563	0.3563	0	0
CHROMIUM (VI)	0.00274	0.4390	0.00320	0.2765	0.7155	0	0
LEAD	0.00718	1.1518	0.02997	2.5896	3.7414	0.056652099	0.000782817
MERCURY	0.00003	0.0054	0.00011	0.0098	0.0152	0.000193312	0
MOLYBDENUM	0.00690	1.1070	0.01441	1.2452	2.3522	0.009276883	0.003676173
NICKEL	0.00436	0.6992	0.02459	2.1245	2.8238	0.021881938	0.001577647
SELENIUM	0.00193	0.3095	0.00209	0.1804	0.4899	0.004906041	0.001971746
SILVER	0.00024	0.0388	0.00308	0.2659	0.3047	0.000754224	0.0005
ZINC	0.15148	24.3064	0.28969	25.0303	49.3366	2.122858169	0.015314706

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
ARSENIC	1.81		41				41.00
BENZENE							No Criteria
CADMIUM	1.57		39				39.00
CHROMIUM	24.40						No Criteria
COPPER	713.69		1500				1500.00
CYANIDE	1.44						No Criteria
CHROMIUM (VI)	11.46						No Criteria
LEAD	21.36		300				300.00
MERCURY	0.22		17				17.00
MOLYBDENUM	11.89		75				75.00
NICKEL	15.24		420				420.00
SELENIUM	17.22		100				100.00
SILVER	6.01						No Criteria
ZINC	947.00		2800				2800.00

TABLE 7: REMOVAL EFFICIENCY CALCULATIONS **Removal Efficiencies must be 1-99%** POLLUTANT	**DRE 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	ENTER THE NAME OF THE REMOVAL EFFICIENCY TO BE USED: **INFEFF, ADRE, MRE, DECILE**, OR **LIT**	**FINAL POTW REMOVAL** %
ARSENIC	48.35	48.35	82.75	91.59			DECILE	**91.59**
BENZENE					50	EPA	LIT	**50**
CADMIUM			85.52		68	EPA	MRE	**85.52**
CHROMIUM	80.74	80.74	74.09		55	EPA	MRE	**74.09**
COPPER	85.14	85.14	87.43	87.09	61	EPA	DECILE	**87.09**
CYANIDE					59		LIT	**59**
CHROMIUM (VI)					82	CWA Consulting	LIT	**82**
LEAD	80.36	80.36	92.82	90.65	55	EPA	DECILE	**90.65**
MERCURY			86.65		50	EPA	MRE	**86.65**
MOLYBDENUM	19.22	19.22	13.02	24.40			DECILE	**24.40**
NICKEL	17.68	17.68	40.47	20.70	29	EPA	DECILE	**20.70**
SELENIUM	48.13	48.13	57.48	52.10			DECILE	**52.10**
SILVER	85.59	85.59	91.70		66	EPA	MRE	**91.70**
ZINC	68.93	68.93	77.79	73.68	67.0	EPA	DECILE	**73.68**

DAILY TABLE 8: MAHL CALCULATIONS POLLUTANT	Daily/7 day NPDES LOADING LBS/DAY	ACUTE LOADING LBS/DAY	LOADING FOR MCL LBS/DAY	OTHER CRITERIA State Receiving Stream WQS LBS/DAY	MOST STRINGENT CRITERIA LBS/DAY	NAME OF MAHL FOR DAILY MAX LIMITS
ARSENIC		1321.524162		1321.524162	**1321.52**	WQ-ACUTE
BENZENE		3628.10016			**3628.10**	WQ-ACUTE
CADMIUM		17.72850276	11.81900184	17.72850276	**11.82**	MCL
CHROMIUM		2425.162241	65.60800449	65.60800449	**65.61**	MCL
COPPER		110.0473013		94.93529884	**94.94**	OTHER
CYANIDE		4.174068293	166.9627317	4.174068293	**4.17**	WQ-ACUTE
CHROMIUM (VI)		30.994776	95.076	30.994776	**30.99**	WQ-ACUTE
LEAD		909.6891726	182.3120141	909.6891726	**182.31**	MCL
MERCURY		4.10160231	5.127002888		**4.10**	WQ-ACUTE
MOLYBDENUM		999999				No Criteria
NICKEL		525.1083504		525.1083504	**525.11**	WQ-ACUTE
SELENIUM		13.57891544		13.57891544	**13.58**	WQ-ACUTE
SILVER		58.44126722	411.7930131	58.44126722	**58.44**	WQ-ACUTE
ZINC		567.8223706		567.8223706	**567.82**	WQ-ACUTE

MONTHLY TABLE 9: MAHL CALCULATIONS POLLUTANT	Monthly NPDES LOADING LBS/DAY	CHRONIC Toxicity Loading LBS/DAY	LOADING FOR HUMAN HEALTH LBS/DAY	OTHER CRITIERIA State Chronic Agriculture or MCL	TABLE 1, 2, 3 OR OTHER SLUDGE LOADING LBS/DAY	MOST STRINGENT CRITERIA LBS/DAY	NAME OF MAHL For Monthly Limits
ARSENIC		547.530705	-264.1741545	193.9879403	10.33984149	**0.503**	Current Conditions**
BENZENE			1.69572216			**1.696**	HH
CADMIUM		2.83963897		26.61579314	10.53353129	**2.840**	WQ-CHRONIC
CHROMIUM		332.5420438		148.0834848		**148.083**	OTHER
COPPER		65.9181026	3872.063868	588.3261458	397.8332263	**65.918**	WQ-CHRONIC
CYANIDE		4.887890927				**4.888**	WQ-CHRONIC
CHROMIUM (VI)		24.44666114	214.1063333	214.1063333		**24.447**	WQ-CHRONIC
LEAD		39.12919713		411.1003206	76.44190994	**39.129**	WQ-CHRONIC
MERCURY		0.028864377			4.531765848	**0.029**	WQ-CHRONIC
MOLYBDENUM		75.83754569		152.3040933	70.99855672	**70.999**	Biosolids
NICKEL		65.1551915	296.1975788	48.34182344	468.659072	**48.342**	OTHER
SELENIUM		3.398041783	136.2452734	15.5590312	44.33435148	**3.398**	WQ-CHRONIC
SILVER		8.50595303				**8.506**	WQ-CHRONIC
ZINC		470.3177059	10827.94586	2920.979448	877.7816495	**470.318**	WQ-CHRONIC

**MAHL based on the temporary modification to receiving stream standard defined as "current conditions" per CDPHE Regulation 38.

TABLE 10: DAILY LOCAL LIMITS POLLUTANT	Most Stringent MAHL	**FINAL MAHL FOR Daily LOCAL LIMITS**	Name FOR MAHL	SAFETY FACTOR % FOR DAILY MAX LIMITS	**MAHL** WITH SAFETY - FACTOR LBS/DAY	Will 2 sets of Local Limits be developed: one for SIUs and one for Commercial? Y , N	MAHL minus DOM + COM LOADING LBS/DAY
ARSENIC	0.503316805	0.503316805	Current Conditions	10	0.452985125	n	0.160673874
BENZENE	1.69572216	1.69572216	HH	10	1.526149944	n	1.526149944
CADMIUM	2.83963897	2.83963897	WQ-CHRONIC	10	2.555675073	n	2.421769045
CHROMIUM	65.60800449	65.60800449	MCL	10	59.04720404	n	58.16917956
COPPER	65.9181026	65.9181026	WQ-CHRONIC	10	59.32629234	n	37.6428969
CYANIDE	4.174068293	4.174068293	WQ-ACUTE	10	3.756661463	n	3.40031702
CHROMIUM (VI)	24.44666114	24.44666114	WQ-CHRONIC	10	22.00199503	n	21.28646658
LEAD	39.12919713	39.12919713	WQ-CHRONIC	10	35.21627742	n	31.47489852
MERCURY	0.028864377	0.028864377	WQ-CHRONIC	10	0.025977939	n	0.010800397
MOLYBDENUM	70.99855672	70.99855672	Biosolids	10	63.89870105	n	61.5465212
NICKEL	48.34182344	48.34182344	OTHER	10	43.5076411	n	40.68388243
SELENIUM	3.398041783	3.398041783	WQ-CHRONIC	10	3.058237605	n	2.568361369
SILVER	8.50595303	8.50595303	WQ-CHRONIC	10	7.655357727	n	7.350704099
ZINC	470.3177059	470.3177059	WQ-CHRONIC	10	423.2859353	n	373.9492872

TABLE 10: CONTINUED POLLUTANT	**Maximum Allowable Load MAL LBS/DAY**	**MAL is for**	SIU EXPANSION / GROWTH FACTOR FUTURE LOADING %	**MAL** WITH EXPANSION / GROWTH FUTURE LOADING LBS/DAY	MASS **RESERVED** FOR HAULED WASTE LBS/DAY	**MAL** Minus the Hauled Waste LBS/DAY
ARSENIC	0.160673874	SIUs	10	0.144606486	0.00994	0.134665047
BENZENE	1.526149944	SIUs	10	1.37353495	0	1.37353495
CADMIUM	2.421769045	SIUs	10	2.17959214	0.00239	2.177200446
CHROMIUM	58.16917956	SIUs	10	52.3522616	0.02405	52.32821061
COPPER	37.6428969	SIUs	10	33.87860721	0.58168	33.29692517
CYANIDE	3.40031702	SIUs	10	3.060285318	0	3.060285318
CHROMIUM (VI)	21.28646658	SIUs	10	19.15781992	0	19.15781992
LEAD	31.47489852	SIUs	10	28.32740867	0.05665	28.27075657
MERCURY	0.010800397	SIUs	10	0.009720358	0.00019	0.009527046
MOLYBDENUM	61.5465212	SIUs	10	55.39186908	0.00928	55.3825922
NICKEL	40.68388243	SIUs	10	36.61549419	0.02188	36.59361225
SELENIUM	2.568361369	SIUs	10	2.311525232	0.00491	2.306619191
SILVER	7.350704099	SIUs	10	6.615633689	0.00075	6.614879465
ZINC	373.9492872	SIUs	10	336.5543585	2.12286	334.4315003

TABLE 10: CONTINUED POLLUTANT	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	**Reserve Capacity** 10% of MAIL LBS/DAY	Calculated MAIL Less Reserve Capacity LBS/DAY	**CALCULATED UNIFORM LOCAL LIMITS FOR SIUs MG/L**
ARSENIC	100.0	**n/a**	N/A	0.134665047	0.01346650	0.121198543	0.0138
BENZENE	100.0	**n/a**	N/A	1.37353495	0.13735349	1.236181455	0.1411
CADMIUM	100.0	**n/a**	N/A	2.177200446	0.21772004	1.959480402	0.2236
CHROMIUM	100.0	**n/a**	N/A	52.32821061	5.23282106	47.09538955	5.3746
COPPER	100.0	**n/a**	N/A	33.29692517	3.32969252	29.96723266	3.4199
CYANIDE	100.0	**n/a**	N/A	3.060285318	0.30602853	2.754256786	0.3143
CHROMIUM (VI)	100.0	**n/a**	N/A	19.15781992	1.91578199	17.24203793	1.9677
LEAD	100.0	**n/a**	N/A	28.27075657	2.82707566	25.44368091	2.9037
MERCURY	100.0	**n/a**	N/A	0.009527046	0.00095270	0.008574341	0.0010
MOLYBDENUM	100.0	**n/a**	N/A	55.3825922	5.53825922	49.84433298	5.6884
NICKEL	100.0	**n/a**	N/A	36.59361225	3.65936123	32.93425103	3.7585
SELENIUM	100.0	**n/a**	N/A	2.306619191	0.23066192	2.075957272	0.2369
SILVER	100.0	**n/a**	N/A	6.614879465	0.66148795	5.953391518	0.6794
ZINC	100.0	**n/a**	N/A	334.4315003	33.44315003	300.9883503	34.3496

TABLE 11: Daily LOCAL LIMIT SUMMARY	MOST STRINGENT OF DAILY AND MONTHLY DAILY AVERAGE LOCAL LIMIT INFORMATION				
POLLUTANT	MAIL FOR SIUs LBS/DAY	UNIFORM CONCENTRATION FOR SIUs (MG/L)	MACL FOR COMMERCIAL USERS (LBS/DAY)	PROPOSED DAILY MAXIMUM LIMIT (MG/L)	PROPOSED MACL FOR COMMERCIAL USERS
ARSENIC	0.1347	0.0138	N/A	**0.014**	N/A
BENZENE	1.3735	0.1411	N/A	**0.14**	N/A
CADMIUM	2.1772	0.2236	N/A	**0.22**	N/A
CHROMIUM	52.3282	5.3746	N/A	**5.37**	N/A
COPPER	33.2969	3.4199	N/A	**3.42**	N/A
CYANIDE	3.0603	0.3143	N/A	**0.31**	N/A
CHROMIUM (VI)	19.1578	1.9677	N/A	**1.97**	N/A
LEAD	28.2708	2.9037	N/A	**2.90**	N/A
MERCURY	0.0095	0.0010	N/A	**0.001**	N/A
MOLYBDENUM	55.3826	5.6884	N/A	**5.69**	N/A
NICKEL	36.5936	3.7585	N/A	**3.76**	N/A
SELENIUM	2.3066	0.2369	N/A	**0.24**	N/A
SILVER	6.6149	0.6794	N/A	**0.68**	N/A
ZINC	334.4315	34.3496	N/A	**34.35**	N/A

ATTACHMENT J

Revised Legal Authority Language

The following language is typical of the current language from the City of Englewood Municipal Code (12-2-5 (B)(2) and City of Littleton Municipal Code (7-5-25(C)(2):

2. *Wastewater Discharge Limitations*. The City is authorized to establish Local Limits pursuant 40 CFR Part 403.5(c). It shall be unlawful for any User to discharge, deposit, cause, or allow to be discharged any waste or wastewater which fails to comply with the limitations imposed by this Section.

    a. Dilution is prohibited as a substitute for treatment and shall be a violation of this Chapter. Except where expressly authorized to do so by an applicable Pretreatment Standard or Requirement, no Industrial User shall ever increase the use of process water, or in any other way attempt to dilute a Discharge as a partial or complete substitute for adequate treatment to achieve compliance with a Pretreatment Standard or Requirement. The City may impose mass limitations on Industrial Users which are using dilution to meet applicable Pretreatment Standards or Requirements or in other cases where the imposition of mass limitations is appropriate.

    b. No Significant Industrial User shall discharge or cause to be discharged wastewater that exceeds the following local limits as specified in the Industrial Wastewater Permit using the methods and procedures prescribed in 12-2-5(G).

Pollutant(1)	Daily Maximum Limit (mg/L)
Arsenic (As)	~~0.55~~
Cadmium (Cd)	~~0.30~~
Chromium-Total (Cr)	~~2.90~~
Chromium(VI) (Cr VI)	~~0.86~~
Copper (Cu)	~~3.94~~
Lead (Pb)	~~0.51~~
Mercury (Hg)	~~0.005~~
Molybdenum (Mo)	~~2.82~~
Nickel (Ni)	~~2.66~~

Pollutant(1)	Daily Maximum Limit (mg/L)
Selenium (Se)	~~0.054~~
Silver (Ag)	~~0.112~~
Zinc (Zn)	~~8.8~~
Benzene ~~(2~~)	~~0.050~~
BTEX (2)(3)	~~0.750~~

(1) All pollutants are to be analyzed as total.

(2) These pollutants and limits generally apply to wastewaters from the cleanup of petroleum or gasoline underground storage tanks. In addition, the pollutants may be required of other users or included in permits where sampling and analysis indicate that the wastewater contains concentrations of these pollutants in excess of the stated limits.

(3) This is the sum of measured concentrations for Benzene, Toluene, Ethylbenzene, and Xylene.

c. All Users subject to a Categorical Pretreatment Standard shall comply with all requirements of such standard, and shall also comply with any limitations contained in this Chapter. Where the same pollutant is limited by more than one (1) Pretreatment Standard, the limitations which are more stringent shall prevail. Compliance with Categorical Pretreatment Standards shall be the timeframe specified in the applicable Categorical Pretreatment Standard.

d. The City may establish more stringent pollutant limits, additional site-specific pollutant limits or additional Pretreatment Requirements when, in the judgment of the City, such limitations are necessary to implement the provisions of this Chapter.

The following language is being adopted for both City ordinances:

2. *Wastewater Discharge Limitations*. The City is authorized to establish Local Limits pursuant 40 CFR Part 403.5(c). It shall be unlawful for any User to discharge, deposit, cause, or allow to be discharged any waste or wastewater which fails to comply with the limitations imposed by this Section.

    a. Dilution is prohibited as a substitute for treatment and shall be a violation of this Chapter. Except where expressly authorized to do so by an applicable Pretreatment Standard or Requirement, no Industrial User shall ever increase the use of process water, or in any other way attempt to dilute a Discharge as a partial or complete substitute for adequate treatment to achieve compliance with a Pretreatment Standard or Requirement. The City may impose mass limitations on Industrial Users which are using dilution to meet applicable Pretreatment Standards or Requirements or in other cases where the imposition of mass limitations is appropriate.

    b. No Significant Industrial User shall discharge or cause to be discharged wastewater that exceeds the following local limits as specified in the Industrial Wastewater Permit using the methods and procedures prescribed in 12-2-5(G).

Pollutant(1)	Daily Maximum Limit (mg/L)
Arsenic (As)	0.014
Cadmium (Cd)	0.22
Chromium-Total (Cr)	5.37
Chromium(VI) (Cr VI)	1.97
Copper (Cu)	3.42
Cyanide	0.31
Lead (Pb)	2.90
Mercury (Hg)	0.001
Molybdenum (Mo)	5.69
Nickel (Ni)	3.76
Selenium (Se)	0.24
Silver (Ag)	0.68
Zinc (Zn)	34.35

Pollutant(1)	Daily Maximum Limit (mg/L)
Benzene	0.14
BTEX (2)(3)	0.750

(1) All pollutants are to be analyzed as total.

(2) These pollutants and limits generally apply to wastewaters from the cleanup of petroleum or gasoline underground storage tanks. In addition, the pollutants may be required of other users or included in permits where sampling and analysis indicate that the wastewater contains concentrations of these pollutants in excess of the stated limits.

(3) This is the sum of measured concentrations for Benzene, Toluene, Ethylbenzene, and Xylene.

c. All Users subject to a Categorical Pretreatment Standard shall comply with all requirements of such standard, and shall also comply with any limitations contained in this Chapter. Where the same pollutant is limited by more than one (1) Pretreatment Standard, the limitations which are more stringent shall prevail. Compliance with Categorical Pretreatment Standards shall be the timeframe specified in the applicable Categorical Pretreatment Standard.

d. The City may establish more stringent pollutant limits, additional site-specific pollutant limits or additional Pretreatment Requirements when, in the judgment of the City, such limitations are necessary to implement the provisions of this Chapter.