City of North Las Vegas, Nevada

Local Limits

Final Draft

February 9, 2016

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City of North Las Vegas, Nevada
Industrial Pretreatment Program
Local Limits Revision

A. Purpose

The General Pretreatment Regulations (40 CFR Part 403) require that each Publicly Owned Treatment Works (POTW) with a pretreatment program develop and enforce Technically-Based Local Limits (TBLLs) which will establish the maximum loading of pollutants that can be accepted from industrial users without causing a violation of applicable environmental standards. Local limits are developed and enforced to prevent Pass Through, Interference, protect sludge disposal practices and prevent impacts to the health and safety of workers (40 CFR sections 403.2 and 403.5(c)(1)). The City of North Las Vegas (City) used the EPA July 2004 Local Limits Development Guidance (EPA 833-R-04-002A) as a framework for establishing limits to protect the POTW and environment (40 CFR 403.8(f)(4)). The City has an on-going pollutant monitoring program and permit which required sampling as specified in its National Pollutant Discharge Elimination System (NPDES) Permit (NV0023647) issued to the City of North Las Vegas Water Reclamation Facility (WRF). The State of Nevada has not been authorized to implement and enforce the Industrial Pretreatment Program under 40 CFR Part 403. EPA is the Approval Authority for the Pretreatment Program. The City is updating local limits pursuant to the requirements specified in the EPA Pretreatment Compliance Inspection Report dated March 6, 2015, and as required in an Administrative Order dated June 26, 2015. EPA and the City had conference call on September 15, 2015, based upon comments made by the City's Consultant in an email dated August 28, 2015, that requested the technical basis for guidance included in the Administrative Order.

B. Municipal Organization

The City serves a population of approximately 230,788. The City has a Mayor and City Council form of government. The Mayor and City Council oversee the City Manager. The City Manager oversees the Department Directors. The Pretreatment Program is in the Utilities Department and this Department is managed by the Director of Utilities. The WRF Operations Supervisor reports to the Director of Utilities and oversees the Pretreatment Program. The Pretreatment Program staff are located at the Water Reclamation Facility.

Changes to the Pretreatment Program legal authority (City Code, 13.28) is initiated by the WRF Operations Supervisor with concurrence of the Director of Utilities. Review of draft changes are done within the Utilities Department. When there is a proposed change to a City Code, the draft language is provided to the City Attorney for review subsequent to management and staff review. The Utilities Department briefs the Mayor, City Manager and other departments, as appropriate. After review is completed by the City, the final draft submittal is sent to EPA for informal review. The City coordinates with EPA to resolve any issues that would interfere with processing the changes as a substantial modification to its Pretreatment Program and as a minor modification to the City's NPDES Permit. Once the EPA informal review is completed, the changes are introduced at the City Council meeting and the City submits to EPA for with an attorney's statement requesting approval. EPA public notices the

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proposed changes for at least 30 days in a newspaper of general circulation that provides meaningful public notice serving the City and other jurisdictions. After the EPA 30-day public comment period, EPA and the City will approve the changes to the Ordinance. The Mayor signs the final Ordinance.

C. Description of POTW(s)

The City of North Las Vegas Water Reclamation Facility (WRF) is an advanced wastewater treatment facility designed to treat an average daily flow of 25 MGD and a peak hourly flow rate of 50 MGD. The WRF treats wastewater from the City of North Las Vegas to meet NDEP permit requirements for discharging into public waters. Wastewater flows by gravity into the WRF via the Southeast Interceptor. WRF process units include the Headworks Facility (HWF) which contains all the preliminary treatment for the WRF. Preliminary treatment includes coarse screening, influent pumping, grit removal, and fine screening. The wastewater then flows to the Membrane Bioreactor (MBR). The purpose of the bioreactor basins is two-fold. One function is to oxidize the biochemical oxygen demand (BOD) in the screened and degritted raw sewage by maintaining a biological (growing microorganisms) population within the basins to convert organic waste into a settleable (filterable) cell mass. The second function is to provide an environment that reduces the influent nitrogen and phosphorus levels to meet the discharge standards.

The biological treatment is performed in six parallel bioreactor basins. Each basin is divided into a series of zones, isolated from each other by submerged baffle weir walls. The configuration and sizing of these zones is based on the basic principles of biological nutrient removal, using a configuration adapted for use in MBRs that optimizes the enhanced biological removal of nitrogen and phosphorus while recognizing the unique differences in the quality and flow of return activated sludge (RAS) in MBR systems.

The zones within the MBR system include: pre-anoxic, anaerobic, anoxic, and aerobic zones. The primary purpose of the pre-anoxic zone is to reduce dissolved oxygen and nitrate concentrations prior to the RAS entering the anaerobic zone. The purpose of the anaerobic zone is to create conditions that promote the release of phosphorus by polyphosphate-accumulating organisms, resulting in a maximal increase in the soluble phosphorus concentration. The purpose of the anoxic zone is to reduce nitrate concentrations. The purpose of the aerobic zones is to provide conditions that permit aeration of a high mixed liquor concentration, oxidize BOD in the bioreactor influent (BI) feed stream, convert influent ammonia to nitrate, and uptake phosphorus.

Disinfection of the wastewater to meet limits is accomplished at the Chlorine Contact Basins (CCBs). Membrane permeate enters the chlorine contact basin via one of two 36-inch pipes from the MBR system. Chlorine solution is injected into the 48-inch CCB influent pipe upstream of a jet mixing system to ensure even distribution of chlorine throughout the CCB influent. Chlorine residual is monitored at both the upstream end of the CCB and the downstream end. Any residual chlorine in the effluent discharged to the Wash is dechlorinated using sodium bisulfite. Recycled water for reuse will receive an additional chlorine dose if needed prior to discharge to the customers. Effluent for plant water will be withdrawn after dechlorination. The CCB's are sized to disinfect peak flow should one basin be taken out of service.

Disinfected wastewater is used for plant utility water, reuse water (none sent off site currently) or is discharged to the Las Vegas Wash (LVW) as allowed by the City's NPDES permit. Wastewater flows over weirs into an effluent box and gravity flows to the LVW. The flow rate of water discharging to the Wash is measured by a magnetic flow meter on the discharge pipe.

The Solids Handling Facility removes water from scum and waste activated sludge (WAS) collected from the membrane bioreactors prior to solids disposal. This is done in two steps, thickening followed by dewatering. The thickening and dewatering equipment are designed to remove excess water from the solids in an effort to reduce the volume and weight of waste transported to a nearby landfill. The solids thickening equipment consists of Gravity Belt Thickeners (GBT). WAS pumped from the membrane bioreactor to the Solids Handling Facility is discharged onto the GBT's rotating belt. The belt is porous and allows water to pass through via gravity, which is then collected and drained back to the headworks for treatment. The remaining thickened waste activated sludge (TWAS) is then collected in a tank and pumped to the next step, dewatering.

The dewatering equipment consists of horizontal bowl centrifuges. The TWAS is pumped into the centrifuges where it is rotated at high speeds to centrifugally separate water from the solids that could not be separated via gravity. The separated water is collected and transported back to the facility's headworks for treatment. The remaining solids, also referred to as cake, are collected below the centrifuge, and conveyed to the cake load-out hoppers. The cake is stored in the fully enclosed, odor controlled hoppers prior to being loaded and hauled to a landfill for disposal. The sludge meets all standards for landfilling of solid waste.

Odor control captures, conveys and treats odorous compounds present in the air that are released during the wastewater treatment process. The odor control system is designed to remove the main odor causing compounds found at wastewater treatment plants such as hydrogen sulfide, methyl mercaptan and di-methyl sulfide. These compounds are detectible to humans at low concentrations and produce a distinct odor associated with wastewater treatment plants, while at higher concentrations they can be hazardous to humans and animals. The odor control system is designed to remove these compounds from the air to levels below which will not result in undesirable odors detectible outside of the facility. The odor control system for the WRF consists of two facilities. The first is for treatment of odors generated at the Headworks and Solids Handling Facilities, and utilizes a Granular Activated Carbon (GAC) system to remove the odorous compounds from the air stream. The second system is design to treat the odorous air generated at the MBR by atmospheric dispersion, through which the air is dispersed to a high elevation and diluted in the atmosphere.

The WRF site is designed to accommodate a future expansion of 25 MGD average daily flow by duplicating the existing facilities.

Receiving Water:

The POTW discharges to the Las Vegas Wash. The City can also discharge to the Sloan Flood Control Channel which is a concrete structure that discharges to the Las Vegas Wash. The receiving water has specific Standards established by the State (NAC 445A.198 and 445A.199). Protected uses include non-contact recreation, irrigation, livestock and freshwater marsh, wildlife and non-fish propagation. State Standards for Toxics are listed in NAC 445A.1236.

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NPDES Permit Required Monitoring Frequency for Pollutants Relevant to the Local Limits Study

Pollutant	NPDES Permit (covers outfalls 001 and 002)	
	Influent	Effluent
Flow, Effluent	Continuous	Continuous
Pretreatment: Priority Pollutants (Section B.PT.1.2.1.)	1 per year	1 per year
Pretreatment: Detected Pollutants (B.PT.1.2.1.)	1 per quarter	1 per quarter
Pretreatment: Sludge (B.PT.1.2.1.)	1 per year	1 per year
Pretreatment: Sludge Detected (B.PT.1.2.1.)	1 per quarter	1 per quarter
NPDES Priority Pollutants		1 per quarter
Ammonia		1 per day
Biochemical Oxygen Demand (BOD_5), effluent	1 per day	1 per day
Nitrate+Nitrite		1 per week
Nitrogen, Inorganic, Total		1 per week
Orthophosphate		1 per day
Phosphorus		1 per day
Total Dissolved Solids (TDS)		1 per week
Total Kjeldahl Nitrogen		1 per week
Total Suspended Solids (TSS)	1 per day	1 per day

The NPDES permit contains a Wasteload Allocation Table for Phosphorus and Ammonia-Nitrogen.

D. Other Municipal/County/State Contributors

The City has industrial user discharges that discharge to the City wastewater collection system and the wastewater is ultimately treated by the Clark County Water Reclamation District.

E. Significant Industrial Users

The City permits 29 Significant Industrial Users (SIUs) also known as Class I Industrial Users. In the current local limits evaluation, the City has developed limits for SIUs. Of the 29 SIUs, 23 SIUs are permitted to discharge to the City's WRF. The remaining 6 SIUs discharge to the Clark County WRF. The City has also included additional flow to allow the City to apply local limits to select non-Significant Industrial Users (non-SIUs). These non-SIUs will be permitted and limits applied at the discretion of the City. Currently, the City has not identified any non-SIUs where local limits would be applied. The City decision to establish local limits for Class I SIUs and other non-SIUs is being done consistent with the 2004 EPA Local Limits Guidance and 40 CFR Section 403.18(b)(2).

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F. Local Limits Process

Local limits are those concentrations or loadings of pollutants that a POTW can accept and prevent Pass Through, Interference, adverse health effects, or a violation of the General and Specific Prohibitions. These limits are adopted by the POTW into their legal authority and apply at the point of discharge from the industrial user into the sewerage system. Local limits are Pretreatment Standards and are based on the Maximum Allowable Headworks Loading (MAHL).

The first step of the process is to review and compile data, supplementing data with additional monitoring where necessary. The POTW develops a list of Pollutants of Concern (POC) to further evaluate. When the final Pollutants of concern are identified, the POTW uses applicable standards and flows to calculate all applicable Allowable Headworks Loading (AHL) for each Standard. The POTW then uses the most stringent AHL, the MAHL, in calculating local limits.

To calculate the MAIL (or local limit), the POTW subtracts out an EPA recommended Safety Factor. The POTW then subtracts out domestic+commercial loadings to obtain the Maximum Allowable Industrial Load (MAIL), which is the regulatory number that EPA approves pursuant to 40 CFR Section 403.18(b). If the City is adopting uniform concentration-based local limits, the City may set aside some of the MAIL or include additional flow in the calculations for expansion of existing industrial users or new industrial users. This "set aside" is at the full discretion of the POTW and may be implemented without further notice to EPA as long as the approved MAIL does not change (see 40 CFR Section 403.18 and the 2004 EPA Local Limits guidance manual). The City may adopt uniform concentration limits, the MAIL the adjusted MAIL or a combination of these.

An example local limits calculation is shown in Attachment 1.

G. Legal Authority Language

Existing Code Language: The City is revoking and re-adopting a new 13.28 for Local Limits that contains all Pretreatment Program Standards and requirements. This activity is separate from the local limits study, but occurring simultaneously.

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New Code Language:

Section 13.28 Limitations on Wastewater Strength

C. Specific Discharge Limitations

1. No Class I Significant Industrial User (SIU) or other designated non-SIU shall discharge or cause to be discharged wastewater that exceeds the following limits:

Pollutant[(a)]	Daily Maximum Discharge Limit (mg/L)
Arsenic	0.44
Cadmium	0.035
Chromium	5.02
Copper	2.35
Lead	0.33
Mercury	0.058
Nickel	1.99
Selenium	0.21
Silver	1.53
Zinc	6.3
Phosphorus, lbs/day[(b)]	879

(a) All Pollutants as Total and in mg/L unless otherwise specified.

(b) This limit is the total mass in pounds per day (lbs/day) that are available to allocate to all Significant Industrial Users and other Permitted Industrial Users identified by the City. Allocations are at the sole discretion of the City.

2. The City may, at its sole discretion, implement local limits through allocation of the Maximum Allowable Industrial Load (MAIL) to Significant Industrial Users and specific permitted non-SIUs that correspond to the uniform concentration local limits shown in the table above. The MAILs that correspond to the Daily Maximum Discharge Limits are hereby incorporated by reference.

3. The following limits shall apply to wastewaters that are discharged from the groundwater cleanup of petroleum or gasoline underground storage tanks or other remediation wastewaters containing these pollutants or where these pollutants are appropriate surrogates. It shall be unlawful for any Industrial User to discharge or cause to be discharged any waste or wastewater that exceeds the following limits, as applicable.

Pollutant[(a)(c)]	Daily Maximum Limit (mg/L)
Benzene	0.050
BTEX[(b)]	0.750

(a) All pollutants shown in the Table are total.

(b) BTEX shall be measured as the sum of Benzene, Ethylbenzene, Toluene and Xylenes.

(c) These limits are based upon installation of air stripping technology as described in the EPA document: "Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks. June 1989."

H. Pollutants of Concern (POC) Evaluation Criteria

The following criteria/data considerations were used to evaluate the POC pollutants consistent with the 2004 EPA Local Limits Guidance:

1. Pollutants of Concern established by EPA, including Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Selenium, Silver, Zinc, BOD_5, Total Suspended Solids, Ammonia and Phosphorus. In addition, the following Local Limits were previously adopted by the City: Barium, Beryllium, Chromium (VI), Oil and Grease (mineral or petroleum), Oil and Grease (animal or vegetable), Organophosphorus or carbamate compounds, pH and Phenols. The City cannot identify the technical basis for the previous local limits that were approved by EPA to apply to all industrial users. The local limits appear to have been intended to apply to Significant Industrial Users.

2. Data review of POTW influent, effluent and sludge data (organics, metals and conventional pollutants).

3. POTW influent/effluent Priority Pollutant analyses, as required by the NPDES permit were reviewed.

4. Permit limited pollutants were reviewed and included in the sampling program, as appropriate (e.g. BOD, TSS, Phosphate, Ammonia).

5. Water Quality Standards as specified at NAC 445A.1236.

6. Inhibition was evaluated. However, no inhibition has been experienced and based upon operations and influent sampling is not expected to be an issue. Consistent with the 2004 EPA Local Limits guidance, site-specific inhibition studies were not conducted. If inhibition is observed, the City will develop site-specific inhibition values or utilize the data in Attachment 2 of this submittal.

7. Sludge was evaluated. However, the City landfills sludge and no Standards under 40 CFR Part 503 apply. No violations of solid waste disposal requirements, including the paint filter test and Toxicity Characteristic Leaching Procedure, have been identified as reported to the State of Nevada under the NPDES permit.

8. Pollutants that may cause adverse worker health and safety effects were evaluated. No pollutants were identified in sampling results that were an acute threat to worker health and safety.

9. Trucked and Hauled Waste. The POTW does not currently accept trucked and hauled waste.

The initial pollutants that were detected and considered potential Pollutants of Concern are shown below and reflect those pollutants recommended by EPA, of concern to the City or otherwise detected in POTW influent or effluent sampling. As allowed for in 40 CFR 403.8(f)(4) and consistent with the 2004 Local Limits Guidance, the City is evaluating some of the pollutants for the need for local limits as noted. Note: Pollutants not shown on the table had all POTW influent and effluent measurements <RL.

Pollutant	Pollutant of Concern?	Comments
Flow	No	The POTW discharges within limits established by the State. The average POTW influent flow was 17.3 mgd (max 20.1 mgd). The NPDES permits allows for up to 25 mgd.
2-Butanone (MEK)	No	No applicable Standards. 6 of 8 POTW effluent measurements <RL.
3&4-Methylphenol	No	No applicable Standards. 5 of 6 POTW effluent measurements <RL.
4-methyl-2-pentanone (MIBK)	No	No applicable Standards. 8 of 8 POTW effluent measurements are <RL.
4-Methylphenol (p-Cresol)	No	No applicable Standards. 5 of 6 POTW effluent measurements <RL.
Acetone	No	No applicable Standards. 6 of 8 POTW effluent measurements are <RL.
Ammonia	No	The average POTW effluent averages 0.19 mg/L (27 lbs/day). The NPDES Permit allows 87 lbs/day (most stringent limit). The POTW will continue to evaluate SIUs for this pollutant.
Arsenic, Total	Yes	EPA Recommended. 18 of 19 influent measurements <RL and 18 of 20 effluent measurements <RL
Barium	No	No applicable Standards. Technical basis for previous local limit unknown.
Benzyl Alcohol	No	No applicable Standards.
Beryllium	No	All POTW effluent measurements <RL. No applicable Standards. Technical basis for previous local limit unknown.
bis(2-ethylhexyl)phthalate	No	17 of 18 POTW effluent measurements <RL. No applicable Standards.

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Pollutant	Pollutant of Concern?	Comments
BOD_5	No	The POTW is in full compliance with all effluent limits. The annual average cBOD design is 62,500 lbs/day (annual average) that is equivalent to 75,000 lbs/day BOD. The maximum monthly cBOD design is 81,315 lbs/day that is equivalent to a BOD design of 97,578 lbs/day. The source of this information is from the Greeley and Hansen design document, Section 2 titled "Original Basis of Design". The conversion factor of 1.2 was used to convert cBOD to BOD (from EPA Permit Writer's Guidance and others). Using 62,500 lbs/day * 1.2 = 75,000 lbs/day. The average influent loading is 50,240 lbs/day or 67% of the design based upon annual average data or 51% of the maximum monthly design data. The design data was not available as a daily maximum. Maximum monthly loading is thought to most closely represent the loading that a daily maximum local limit would be based upon. The City had established a surcharge limit in previous Ordinance and will evaluate surcharging in the future.
Boron	No	Maximum effluent concentration is 0.32 mg/L or 43% of the most stringent applicable Standard.
Bromodichloromethane	No	No applicable Standard. Generally, a byproduct of chlorination. The City has not identified this as a pollutant discharged by SIUs.
Cadmium, Total	Yes	EPA Recommended. 17 of 19 influent measurements <RL and 20 of 20 effluent measurements <RL.
Chlorodibromomethane	No	No applicable Standard. A byproduct of chlorination. The City has not identified this as a pollutant discharged by SIUs.
Chloroform	No	A byproduct of chlorination. No IU identified as being a source. Maximum influent concentration is 0.03 mg/L or 50% of the fume toxicity value. Average influent is 0.011 mg/L or 18% of the fume toxicity value. The City has not identified this as a pollutant discharged by SIUs.
Chloromethane	No	No applicable Standard. All effluent measurements <RL.
Chromium(VI), Dissolved	No	All effluent measurements <RL. No identified IU sources. Technical basis for previous local limit not known.
Chromium, Total	Yes	EPA Recommended. 15 of 19 influent measurements <RL and 20 of 20 effluent measurements <RL.
Copper, Total	Yes	EPA Recommended. 19 POTW influent measurements were >RL. 18 of 20 POTW effluent measurements were <RL. POTW influent Copper concentrations are typically driven by raw water source water that causes Copper to leach from pipes. The City will continue to regulate this pollutant.

Pollutant	Pollutant of Concern?	Comments
Cyanide	No	17 of 19 influent measurements are <RL. No industrial user has been identified as using or discharging Cyanide. 13 of 20 effluent measurements are <RL. Commonly formed in the wastewater treatment process.
Fluoride	No	Effluent averages 58% of the applicable Standard. Source is drinking water.
Iron	No	Effluent averages 4% of the applicable Standard.
Lead, Total	Yes	EPA Recommended. 16 of 19 POTW influent measurements <RL and 20 of 20 POTW effluent measurements <RL.
Mercury, Total	Yes	EPA Recommended. 11 of 19 POTW influent measurements <RL and 17 of 17 effluent measurements <RL. Anticipate State will be requiring more sensitive test methods and EPA will promulgate Dental Categorical Standards.
Molybdenum, Total	No	Landfills sludge. POTW effluent is <1% of the Chronic WQS.
Nickel, Total	Yes	EPA Recommended. 17 of 19 POTW influent measurements <RL and 19 of 20 POTW effluent measurements <RL.
Nitrate+Nitrite	No	No applicable Standard. Not identified by State as a pollutant of concern.
N-Nitroso-dimethylamine	No	No applicable Standard. The City has not identified this as a pollutant discharged by SIUs.
N-Nitrosodi-N-propylamine	No	No applicable Standards. The City has not identified this as a pollutant discharged by SIUs.
Oil and Grease, Animal or vegetable	No	City has moved previous local limit of 250 mg/L to the Specific Prohibitions. POTW effluent average 1.1 mg/L. The City uses its FOG Program to control Oil and Grease where needed.
Oil and Grease, Mineral or Petroleum	No	City has moved previous local limit of 100 mg/L to the Specific Prohibitions. The City has not identified Petroleum Oil and Grease as a problem in the POTW influent or effluent (visual). The City uses its sand/oil separator program to control Petroleum based Oil and Grease where needed.
Organophosphorus or carbamate compounds	No	City has not identified any specific pollutants falling into these categories that are of concern. No applicable Standards. Technical basis for previous local limit unknown.
Phenol	No	Maximum POTW effluent is 0.012 mg/L. No applicable Standard. Technical basis for previous local limit unknown.
Phosphorus	Yes	Wasteload allocation in NPDES permit is 30 lbs per day (0.2 mg/L) as a long term average. POTW effluent averages 0.16 mg/L per day. The City had established a surcharge limit in previous Ordinance and will evaluate surcharging in the future.
Phosphorus - Ortho	No	No applicable Standard.

Pollutant	Pollutant of Concern?	Comments
Selenium, Total	Yes	EPA Recommended. 16 of 19 POTW influent measurements <RL and 18 of 19 POTW effluent measurements <RL.
Silver, Total	Yes	EPA Recommended. 17 of 19 POTW influent measurements <RL and 20 of 20 POTW effluent measurements <RL.
TDS	No	POTW has adopted a reporting requirement and source identification requirement for Class I SIUs and other designated IUs discharging >1200 mg/L. POTW effluent averages 887 mg/L or 47% of the annual average Standard.
TKN	No	No applicable Standard. See Ammonia.
Total Inorganic Nitrogen	No	No applicable Standard. See Ammonia.
Total Suspended Solids (TSS)	No	The POTW is in full compliance with all effluent limits. The annual average TSS design is 68,805 lbs/day (annual average) and the maximum monthly TSS design is 89,445 lbs/day. The current influent loading averages 46,198 lbs/day or 67% of the design based upon annual average data. The maximum daily influent loading is estimated at 83,734 lbs/day or 94% of the maximum monthly design data if all conventional data is evaluated at the 80th percentile value (580 mg/L). If newer data is used, the Maximum daily loading is 60,635 lbs/day or 68% of the monthly maximum. The design data was not available as a daily maximum and as is typical with POTW influents, TSS influent data is widely variable. The City has not violated its NPDES permit for TSS. The City had established a surcharge limit in previous Ordinance and will evaluate surcharging in the future.
Zinc, Total	Yes	EPA Recommended. POTW effluent measurements (n=20) showed an average of 0.058 mg/L. This is 15% of the most stringent Standard (0.388 mg/L – Chronic Aquatic Life).

I. Wastewater Treatment Plant Data Summaries for Local Limits

POTW Flow for Local Limits (mgd)	17.3	POTW design flow is 25 mgd
Average SIU Flow	2.202	23 Permitted SIUs
Permitted SIU Flow for Local Limits (mgd):	3.422	
Flow for Permitted Non-SIU Industrial Users (mgd)	0.02	This allows the POTW to apply local limits to non-SIUs
Total SIU + Other Non-SIU Flows for Local Limits:	3.442	Used in conversion of MAIL to mg/L
Combined plus Domestic + Commercial Flow (mgd):	14.46	Calculated by subtracting out the average SIU flow and return flows.
Trucked and Hauled Wastewater Flow (mgd):	0	One waste hauler is permitted as a SIU.
I&I / Stormwater / Other:	0	
Sludge Flow to Disposal (mgd):	N/A	Sludge is Landfilled
Acute (mgd):	0	
Chronic (mgd):	0	
Agriculture Flow (mgd):	0	
Irrigation Flow (mgd):	0	
Hardness for Metals Calculations (mg/L):	400	State WLA

The POTW flow for local limits reflects the actual POTW wastewater flow and includes reuse flows and the average flow for Significant Industrial Users (SIUs). The City has not currently identified any non-SIUs where the City intends to permit and apply local limits.

Applicable Standards for the Local Limits Evaluation

North Las Vegas Applicable Standards Pollutant	POTW Design lbs/day	NAC 445A.1236 Acute WQS mg/L	NAC 445A.1236 Chronic WQS mg/L	445A.1236 Irrigation mg/L	445A.1236 Livestock mg/L	445A.199 State Existing Quality mg/L
Arsenic		0.34	0.15	0.1	0.05	
Cadmium		0.0087	0.0008	0.01		
Chromium (Total)		5.7633	0.2682	0.10	1	
Copper		0.0517	0.0306	0.2	0.5	
Lead		0.4768	0.0186	5.0	0.1	
Mercury		0.0014	0.00		0.01	
Nickel		1.5159	0.1685	0.2000		
Selenium		0.02	0.05	0.02	0.05	
Silver		0.0411				
Zinc		0.3878	0.3878	2.0000	25	
Phosphorus	1900					0.2

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POTW Influent Loading to the WRF

North Las Vegas Pollutant	Average POTW Influent mg/L	Comment and Notes	RL Handling	Average POTW Flow mgd	POTW Influent lbs/day
Arsenic	0.0025	n=19, 18<RL	½ RL	17.3	0.361
Cadmium	0.0006	n=19, 17<RL	½ RL	17.3	0.087
Chromium (Total)	0.003	n=19, 15<RL	½ RL	17.3	0.433
Copper	0.151	n=19, 0<RL	N/A	17.3	21.800
Lead	0.0017	n=19, 16<RL	½ RL	17.3	0.245
Mercury	0.000068	n=19, 11<RL	½ RL	17.3	0.009817
Nickel	0.006	n=19, 17<RL	½ RL	17.3	0.866
Selenium	0.0025	n=19, 16<RL	½ RL	17.3	0.361
Silver	0.0023	n=19, 17<RL	½ RL	17.3	0.332
Zinc	0.24	n=19, 1<RL	½ RL	17.3	34.648
Phosphorus	8.6	n=956, 0<RL	N/A	17.3	1241.6

POTW Effluent Loading to the WRF

North Las Vegas Pollutant	Average POTW Effluent mg/L	Comment and Notes	RL Handling	Average POTW Flow mgd	POTW Effluent lbs/day
Arsenic	0.0020	n=20, 18<RL	½ RL	16.5	0.275
Cadmium	0.00060	n=20, 20<RL	½ RL	16.5	0.083
Chromium (Total)	0.0026	n=20, 20<RL	½ RL	16.5	0.358
Copper	0.0232	n=20, 18<RL	½ RL	16.5	3.194
Lead	0.00260	n=20, 20<RL	½ RL	16.5	0.358
Mercury	0.0001	n=17, 17<RL	½ RL	16.5	0.013779
Nickel	0.0056	n=20, 19<RL	½ RL	16.5	0.771
Selenium	0.00240	n=19, 18<RL	½ RL	16.5	0.330
Silver	0.00260	n=20, 20<RL	½ RL	16.5	0.358
Zinc	0.058	n=20, 1<RL	½ RL	16.5	7.986
Phosphorus	0.16	n=956, 315<RL	½ RL	16.5	22.0

POTW Domestic+Commercial Loading to the WRF

Pollutant	Domestic+ Commercial Contribution to POTW mg/L	Comment and Notes	RL Handling	Domestic plus Commercial Average Flow mgd	Calculated Domestic+Commercial Contribution lbs/Day
Arsenic	0.0091	n=15, 14<RL	½ RL	14.46	1.098
Cadmium	0.0012	n=15, 14<RL	½ RL	14.46	0.145
Chromium	0.0025	n=15, 14<RL	½ RL	14.46	0.302
Copper	0.0993	n=15, 0<RL	N/A	14.46	11.982
Lead	0.0045	n=15, 15<RL	½ RL	14.46	0.543
Mercury	0.000083	n=15, 11<RL	½ RL	14.46	0.010
Nickel	0.0035	n=15, 11<RL	½ RL	14.46	0.422
Selenium	0.0145	n=15, 13<RL	½ RL	14.46	1.750
Silver	0.0038	n=15, 15<MDL	½ RL	14.46	0.459
Zinc	0.218	n=15, 0<MDL	N/A	14.46	26.306
Phosphorus	4.93	n=15	N/A	14.46	594.9

POTW Sludge Metals Concentration

Sewage Sludge Pollutant	Maximum POTW Sludge to Disposal mg/kg Dry Weight
Arsenic	0.954
Cadmium	0.27
Chromium	2.8
Copper	130
Lead	1.6
Mercury	0.27
Nickel	2.3
Selenium	2.8
Silver	0.38
Zinc	140

Note: The POTW landfills sludge. The actual data provided for informational purposes only. Sludge meets TCLP and Paint-filter tests. No applicable sludge standards.

Removal Efficiency Calculations

North Las Vegas Removal Efficiency Calculations POLLUTANT	MRE Mean Removal Efficiency %[a]	LIT Literature Removal Efficiency %	Source of Literature Removal Efficiency Data[b]	Enter the Name of the Removal Efficiency to be Used: MRE, or LIT	Final POTW Removal %
Arsenic[b]	20.0	53	EPA-8th Decile	LIT	53
Cadmium[b]	0	91	EPA-8th Decile	LIT	91
Chromium (Total)[b]	13.3	91	EPA-8th Decile	LIT	91
Copper[b]	84.6	95	EPA-8th Decile	LIT	95
Lead[b]	-52.9	76	EPA-8th Decile	LIT	76
Mercury[b]	-47.1	94	CWACS (n=28)	LIT	94
Nickel[b]	6.7	62	EPA-8th Decile	LIT	62
Selenium[b]	4.0	67	EPA-8th Decile	LIT	67
Silver[b]	-13.0	88	EPA-8th Decile	LIT	88
Zinc	75.8			MRE	75.8
Phosphorus	98.1			MRE	98.1

(a) Removal Efficiency calculations based upon influent and effluent concentration.

(b) Default removal efficiencies were used for Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Silver values due to be being reported <RL in all or most POTW influent and/or effluent measurements. Mercury default data was used because data generated by POTWs using Method 1631E show consistent removal of 90-95%. The City used a 94% removal efficiency for Mercury literature data from CWACS (n=28). In the case of the other pollutants, the 8th decile data from the EPA guidance for tertiary treatment was used.

Allowable Headworks Loading Calculations

North Las Vegas AHL Calculations Pollutant	POTW Design lbs/day	Acute WQS lbs/day	Chronic WQS lbs/day	Livestock lbs/day	Irrigation lbs/day	445A.199 State Existing Quality lbs/day	Most Stringent AHL for Common Stds lbs/day	Name of Most Stringent AHL
Arsenic		104.4368	46.0751	15.3584	30.7167		15.3584	Livestock
Cadmium		13.9556	1.2833		16.0409		1.2833	State Chronic WQS
Chromium (Total)		9244.8775	430.2181	1604.0944	160.4094		160.4094	Irrigation
Copper		149.2770	88.3535	1443.6850	577.4740		88.3535	State Chronic WQS
Lead		286.8121	11.1886	60.1535	3007.6771		11.1886	State Chronic WQS
Mercury		3.3686	1.8527	24.0614			1.8527	State Chronic WQS
Nickel		575.9163	64.0160		75.9834		64.0160	State Chronic WQS
Selenium		8.7496	21.8740	21.8740	8.7496		8.7496	State Chronic WQS
Silver		49.4462					49.4462	State Acute WQS
Zinc		231.6666	231.6666	14934.6724	1194.7738		231.6666	State Chronic WQS
Phosphorus	1900					1552	1552	State Existing Quality

Maximum Allowable Industrial Loading (MAIL) Calculation

Pollutant	MAHL lbs/day	Controlling Criteria or Standard for MAHL	Safety Factor %[(a)]	MAHL minus Safety Factor lbs/day	Subtract out Domestic+Commercial Loadings lbs/day	MAIL Maximum Available Industrial Loading lbs/day
Arsenic	15.3584	Livestock	10	13.8225	12.7244	12.7244
Cadmium	1.2833	State Chronic WQS	10	1.1549	1.0101	1.0101
Chromium (Total)	160.4094	Irrigation	10	144.3685	144.0668	144.0668
Copper	88.3535	State Chronic WQS	10	79.5182	67.5358	67.5358
Lead	11.1886	State Chronic WQS	10	10.0697	9.5267	9.5267
Mercury	1.8527	State Chronic WQS	10	1.6675	1.6574	1.6574
Nickel	64.0160	State Chronic WQS	10	57.6144	57.1921	57.1921
Selenium	8.7496	State Chronic WQS	10	7.8746	6.1249	6.1249
Silver	49.4462	State Acute WQS	10	44.5016	44.0430	44.0430
Zinc	231.667	State Chronic WQS	10	208.500	182.194	182.194
Phosphorus	1552	State Existing Quality	5	1474	879	879

(a) A safety factor of 5% was used for Phosphorus due to the large number of monitoring results and the City's belief that the data is accurate.

Local Limits Calculations

Pollutant	Final MAIL lbs/day	MAHL lbs/day	Local Limits to be Adopted as (U)niform or (M)ass	Calculated SIU Limits	Units
Arsenic	12.7244	15.3584	U	0.44	mg/L
Cadmium	1.0101	1.2833	U	0.035	mg/L
Chromium	144.0668	160.4094	U	5.02	mg/L
Copper	67.5358	88.3535	U	2.35	mg/L
Lead	9.5267	11.1886	U	0.33	mg/L
Mercury	1.6574	1.8527	U	0.058	mg/L
Nickel	57.1921	64.0160	U	1.99	mg/L
Selenium	6.1249	8.7496	U	0.21	mg/L
Silver	44.0430	49.4462	U	1.53	mg/L
Zinc	182.194	231.667	U	6.3	mg/L
Phosphorus	879	1552	M	879	lbs/day

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J. Summary Pollutant Data (POTW Influent, Effluent, Domestic+Commercial)

The pollutants in the following table are as mg/L and total unless otherwise specified. Pollutant data is from samples August 2014-July 2015. Data for conventional pollutants (DMR monitoring) represents and includes older data collected from January 1, 2013 to August 2015. Newer data is used except where noted.

INFLUENT - Pollutant	Average	Maximum	Minimum	Count	# <MDL
Flow (mgd)	17.3	20.1	15.6	959	0
2,3,7,8-TCCD	1.019E-9	1.4E-09	7.67E-10	10	10
2-Butanone (MEK)	0.0037	0.0055	0.0027	3	0
3&4-Methylphenol	0.052	0.067	0.038	5	0
4-methyl-2-pentanone (MIBK)	0.0053	0.0053	0.0053	1	0
4-Methylphenol (p-Cresol)	0.047	0.067	0.034	7	0
Acetone	0.14	0.28	0.044	3	0
Ammonia from additional POTW monitoring	26	43	17	21	0
Ammonia from POTW DMR Monitoring	24	54	11	959	0
Antimony	0.00125	0.00125	0.00125	13	13
Arsenic, Total	0.0025	0.0029	0.002	19	18
Barium	0.14	0.16	0.12	6	0
Benzyl Alcohol	0.019	0.02	0.018	2	0
Beryllium	0.0005	0.001	0.0005	19	19
bis(2-ethylhexyl) phthalate	0.014	0.068	0.005	18	13
BOD5 from additional POTW monitoring.	311	490	190	21	0
BOD5 from POTW DMR Monitoring – This data used.	348	740	120	955	0
Boron	0.3	0.3	0.2	11	0
Bromodichloromethane	0.0066	0.025	0.0025	19	15
Cadmium, Total	0.0006	0.0016	0.0005	19	17
Chlorodibromomethane	0.0032	0.0033	0.0031	2	0
Chloroform	0.011	0.03	0.0025	19	9
Chloromethane	0.0057	0.0057	0.0057	1	0
Chromium (VI)	0.00033	0.00033	0.00033	1	0
Chromium, Total	0.003	0.005	0.002	19	15

INFLUENT - Pollutant	Average	Maximum	Minimum	Count	# <MDL
Copper, Total	0.151	0.21	0.089	19	0
Cyanide	0.011	0.025	0.002	19	17
Fluoride	0.54	0.94	0.05	9	4
Iron	1.13	2.4	0.47	11	0
Lead, Total	0.0017	0.005	0.001	19	16
Mercury, Total	0.000068	0.00014	0.00005	19	11
Molybdenum, Total	0.007	0.011	0.005	10	9
Nickel, Total	0.006	0.014	0.005	19	17
Nitrate+Nitrite					0
N-Nitroso-dimethylamine	0.002003	0.005	4.7E-09	15	7
N-Nitroso-N-propylamine	0.010001	0.025	0.000000001	15	13
Oil and Grease	40	65	23	6	0
Phenol	0.012	0.016	0.01	7	3
Phosphorus from additional POTW monitoring	7.3	13	4	21	0
Phosphorus from POTW DMR Monitoring (this data was used)	8.6	24.0	0.3	959	0
Phosphorus - Ortho					0
Selenium, Total	0.0025	0.0028	0.0016	19	16
Silver, Total	0.0023	0.0025	0.0009	19	17
TDS	883	970	840	6	0
Thallium	0.0005	0.0005	0.0005	13	13
TKN from additional POTW monitoring	42	49	32	15	0
TKN from POTW DMR Monitoring	47	140	26.0	959	0
Total Inorganic Nitrogen					0
Total Phenolics	0.051	0.065	0.043	6	0
TSS from additional POTW monitoring.	320	420	210	21	0
TSS from POTW DMR Monitoring – This data used and the 80th percentile value from this data was used for maximums (580 mg/L).	495	1700	57	959	0
Uranium	0.0025	0.0025	0.0025	11	11
Zinc, Total	0.24	0.34	0.005	19	1

The pollutants in the following table are as mg/L and total unless otherwise specified. Pollutant data is from samples August 2014-July 2015. Data for conventional pollutants (DMR monitoring) represents and includes older data collected from January 1, 2013 to August 2015. Newer data is used except where noted.

EFFLUENT - Pollutant	Average	Maximum	Minimum	Count	# <MDL
Flow (mgd)	16.50	20.80	13.80	959	0
2,3,7,8-TCCD	0.71E-9	9.74E-10	4.67E-10	10	10
2-Butanone (MEK)	0.0084	0.046	0.0025	8	6
3&4-Methylphenol	0.0146	0.045	0.00465	6	5
4-methyl-2-pentanone (MIBK)	0.0025	0.0025	0.0025	8	8
4-Methylphenol (p-Cresol)	0.0146	0.045	0.00465	6	5
Acetone	0.0419	0.2	0.0025	8	6
Ammonia from additional POTW monitoring	0.1842	0.53	0.07	22	0
Ammonia from POTW DMR Monitoring (used this data)	0.19	1.80	0.02	958	3
Antimony	0.0013	0.00125	0.00125	13	13
Arsenic, Total	0.0020	0.0025	0.0007	20	18
Barium	0.0757	0.093	0.066	7	0
Benzyl Alcohol					0
Beryllium	0.0005	0.001	0.0005	20	20
bis(2-ethylhexyl)phthalate	0.0096	0.0665	0.00465	18	17
BOD5 from additional POTW monitoring	1.8	3	1	22	22
BOD5 from POTW DMR Monitoring	3.09	14.00	2.00	955	903
Boron	0.2691	0.32	0.24	11	0
Bromodichloromethane	0.0084	0.014	0.0025	20	5
Cadmium, Total	0.0006	0.001	0.0005	20	20
Chlorodibromomethane	0.0027	0.0032	0.0025	4	2
Chloroform	0.0369	0.34	0.003	20	0
Chloromethane	0.0025	0.0025	0.0025	8	8
Chromium, Total	0.0026	0.005	0.0025	20	20
Copper, Total	0.0232	0.025	0.006	20	18
Cyanide	0.0077	0.025	0.0025	20	13
Fluoride	0.5767	0.9	0.1	9	3
Iron	0.0442	0.08	0.028	11	0
Lead, Total	0.0026	0.005	0.00125	20	20
Mercury, Total	0.0001	0.00005	0.00005	17	17

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EFFLUENT - Pollutant	Average	Maximum	Minimum	Count	# <MDL
Molybdenum, Total	0.0065	0.01	0.005	10	10
Nickel	0.0056	0.011	0.005	20	19
Nitrate+Nitrite from additional POTW monitoring	4.8923	6	3.8	13	0
Nitrate+Nitrite from POTW DMR Monitoring	4.93	6.3	3.5	138	0
N-Nitrosodimethylamine	0.0098	0.0265	9.4E-09	16	8
N-Nitroso-N-propylamine	0.0031	0.025	0.000001	16	11
Oil and Grease	1.1286	1.7	0.7	7	0
Phenol	0.0120	0.012	0.012	1	0
Phosphorus from additional POTW monitoring	0.1559	0.78	0.05	22	5
Phosphorus from POTW DMR Monitoring	0.16	5.0	0.1	959	315
Phosphorus - Ortho, Dissolved from additional POTW monitoring	0.1313	0.38	0.05	15	4
Phosphorus - Ortho, Dissolved from POTW DMR Monitoring	0.15	5.9	0.1	958	344
Selenium, Total	0.0024	0.0025	0.0014	19	18
Silver, Total	0.0026	0.005	0.0025	20	20
TDS from additional POTW monitoring	886.5000	980	810	20	0
TDS from POTW DMR Monitoring	901	1100	440	140	0
Thallium	0.0005	0.0005	0.0005	13	13
TKN	0.9692	1.6	0.52	13	0
TKN from POTW DMR Monitoring	0.99	1.9	0.35	137	0
Total Inorganic Nitrogen	5.0846	6.2	4.3	13	0
Total Inorganic Nitrogen from POTW DMR Monitoring	5.10	6.4	4.0	138	0
Total Phenolics (see Phenol)					
TSS from additional POTW monitoring	0.9773	2	0.5	22	9
TSS from POTW DMR Monitoring	0.67	5.0	0.5	958	763
Uranium	0.0025	0.0025	0.0025	11	11
Zinc, Total	0.0580	0.088	0.005	20	1

The pollutants in the following table are as mg/L and total unless otherwise specified. Pollutant data is from samples November 2014 to September 2015.

Domestic+Commercial - Pollutant	Average	Maximum	Minimum	Count	# <MDL	RLs by Lab
Ammonia	27	29	26	7	0	
Arsenic, Total	0.0091	0.015	0.0022	15	14	
Barium	0.1329	0.16	0.12	7	0	
Beryllium	0.0005	0.0005	0.0005	7	7	
Bis (2-ethylhexyl) phthalate	0.0342	0.07	0.0047	7	3	
BOD5	273	570	190	15	0	
Bromodichloromethane	0.0056	0.014	0.0025	7	4	
Cadmium, Total	0.0012	0.0023	0.0005	15	14	
Chloroform	0.0165	0.027	0.0029	6	0	
Chromium, Total	0.0025	0.0026	0.0025	15	14	
Copper, Total	0.0993	0.17	0.07	15	0	
Cyanide	0.0183	0.025	0.0004	7	5	
Diethylphthalate	0.0116	0.066	0.0025	7	6	
Lead, Total	0.0045	0.00725	0.00125	15	15	
Mercury, Total	0.000083	0.0001	0.00005	15	11	
Nickel, Total	0.0035	0.009	0.0025	15	11	
Oil and Grease	37.1429	51	25	7	0	
Phenol	0.0103	0.012	0.01	7	5	
Phenols, Total	0.0443	0.054	0.024	7	0	
Phosphorus	4.9333	6	3.9	15	0	
Selenium, Total	0.0145	0.025	0.002	15	13	
Silver, Total	0.0038	0.005	0.0025	15	15	
TDS	807.1	890	760	7	0	
TSS	151	236	98	15	0	
Zinc, Total	0.2180	0.41	0.15	15	0	
2-Butanone (MEK)	0.0034	0.0054	0.0025	7	4	
Acetone	0.0612	0.4	0.0025	7	5	
Chlorodibromomethane	0.0026	0.0031	0.0025	7	5	
3&4 Methylphenol	0.0588	0.1	0.0025	7	1	
4-Methylphenol	0.0699	0.1	0.04	7	0	

K. Analytical and Sampling Methods

1. Analytical Methods and Sample Preservation

All wastewater samples were collected, preserved and analyzed using methods approved pursuant to 40 CFR Part 136 and 40 CFR Part 403, Appendix E and were of such quality as to be legally defensible. The City uses a mix of in-house and external support for analytical work performed under its pretreatment program.

2. Sample Types

POTW influent and effluent samples were collected as required by the NPDES Permit. If sampling for oil and grease, cyanide, pH, sulfides, phenols or volatile organic compounds, the City would use grab samples.

3. Example Liquid Matrix Sampling Criteria

Pollutant	Sample Type	Sample Hold Time	Sample Preservation
Arsenic	24 hr Composite	6 Months	HNO_3 to pH <2
Biochemical Oxygen Demand (BOD5)	24 hr Composite	48 Hours	Cool to 6°C
Cadmium	24 hr Composite	6 Months	HNO_3 to pH <2
Chromium (total)	24 hr Composite	6 Months	HNO_3 to pH <2
Copper	24 hr Composite	6 Months	HNO_3 to pH <2
Cyanide	Grab (for Pretreatment Required Sampling)	14 Days	Cool to 6°C, 1:1 NaOH to pH >12
Lead	24 hr Composite	6 Months	HNO_3 to pH <2
Mercury	Grab	28 Days 90 Days	HNO_3 to pH <2 5 mL/L 12N HCl or 5 mL/L BrCl
Molybdenum	24 hr Composite	6 Months	HNO_3 to pH <2
Nickel	24 hr Composite	6 Months	HNO_3 to pH <2
Phosphorus	Grab	28 days	Cool to 6°C, 1:1 H_2SO_4 to pH <2
Selenium	24 hr Composite	6 Months	Cool to 6°C, 1:1 HNO_3 to pH <2
Silver	24 hr Composite	6 Months	HNO_3 to pH <2
Total Suspended Solids (TSS)	24 hr Composite	7 Days	Cool to 6°C
Zinc	24 hr Composite	6 Months	HNO_3 to pH <2

4. Chain of Custody (COC)

All samples included a COC for sample identification (sample location) and tracking. COC information and records are maintained at the Water Reclamation Facility and the City. Quality Assurance/Quality Control for sampling is provided with each sample report by the contract laboratory.

L. Recordkeeping

All records that are the basis for the local limits developed shall be maintained for at least three years beyond when the local limits are no longer implemented and enforced. The records will be kept at the Water Reclamation Facility as a hardcopy and/or in electronic (.pdf) format.

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ATTACHMENT 1

EXAMPLE CALCULATION AND FORMULAS

Process and Formulas used in Calculating Allowable Headworks Loadings (from 2004 EPA Guidance) – Copper Example

1. Applicable Allowable Headworks Loadings (AHLs)

   Water Quality: $(8.345*(WQS*(Q_{recH2O} + Q_{POTW})-(Q_{recH2O} * C_{stream})))/(1-(R_{POTW}/100))$

WQS: Applicable Water Quality Standard (mg/L): Acute or Chronic as appropriate (see Page 17)
Q_{recH2O}: Receiving Water Low Flow (mgd): Acute or Chronic as appropriate. 0 mgd.
Q_{POTW}: POTW flow for local limits (mgd)
C_{stream}: Upstream Receiving Water Concentration (mg/L) if specified by State: N/A
R_{POTW}: Removal Efficiency for POTW (%). Typically, the Mean Removal Efficiency is used.

Water Quality (Acute) = (8.345 * 0.0517 mg/L * 17.3 mgd)))/(1-95/100)
= 149.277 lbs/day

Water Quality Chronic = (8.345 * 0.0306 mg/L * 17.3 mgd)))/(1-95/100)
= 88.3535 lbs/day

Livestock WQS = (8.345 * 0.5 mg/L*17.3 mgd)))/(1-95/100)
= 1443.685 lbs/day

Irrigation WQS = (8.345 * 0.2 mg/L*17.3 mgd)))/(1-95/100)
= 577.474 lbs/day

2. Determine MAHL (most stringent AHL) = 88.3535 lbs/day, chronic WQS.

3. Determine the Maximum Allowable Industrial Loading (MAIL)

   MAIL = MAHL * 1-SF/100 - Domestic+Commercial Loading

   MAIL = (88.3535 lbs/day * 0.9 – 11.982 lbs/day) = 67.536 lbs/day

4. Calculate the Uniform Concentration Local Limit (mg/L)

   (MAIL/(SIU + Permitted non-SIU Flow (mgd) * 8.345))

   67.536 lbs/day / (3.442 mgd * 8.345) = 2.35 mg/L

Attachment 2
Inhibition Values

In the event that inhibition would occur in the future, the following EPA inhibition thresholds (see Appendix G of the 2004 Local Limits Guidance) or other peer-reviewed inhibition thresholds listed below may be used in setting permit specific limits or a local limit. Where a specific pollutant is identified and the concentration that is causing inhibition is determined, that site specific pollutant data would be used for a permit specific limit or a local limit.

Pollutant	Reported Range of Activated Sludge Inhibition Threshold Levels, mg/L
Ammonia	480
Arsenic	0.1
Cadmium	1 - 10
Chromium (VI)	1
Chromium (III)	10 - 50
Chromium (Total)	1 - 100
Copper	1
Cyanide	0.1 - 5
	5
Iodine	10
Lead	1.0 - 5.0
	10 - 100
Mercury	0.1 - 1
	2.5 as Hg (II)
Nickel	1.0 - 2.5
	5
Sulfide	25 -30
Zinc	0.3 - 5
	5 - 10
Anthracene	500
Benzene	100 - 500
	125 - 500
2-Chlorophenol	5
	20 - 200
1,2 Dichlorobenzene	5
1,3 Dichlorobenzene	5
1,4 Dichlorobenzene	5
2,4-Dichlorophenol	64
2,4 Dimethylphenol	40 - 200
2,4 Dinitrotoluene	5
1,2-Diphenylhydrazine	5
Ethylbenzene	200
Hexachlorobenzene	5
Naphthalene	500

Pollutant	Reported Range of Activated Sludge Inhibition Threshold Levels, mg/L
	500
	500
Nitrobenzene	30 - 500
	500
	500
Pentachlorophenol	0.95
	50
	75 - 150
Phenanthrene	500
	500
Phenol	50 - 200
	200
	200
Toluene	200
2,4,6 Trichlorophenol	50 - 100
Surfactants	100 - 500

Pollutant	Reported Range of Nitrification Inhibition Threshold Levels, mg/L
Arsenic	1.5
Cadmium	5.2
Chloride	180
Chromium (VI)	1 - 10 [as $(CrO_4)^{2-}$]
Chromium (T)	0.25 - 1.9
	1 - 100
	(trickling filter)
Copper	0.05 - 0.48
Cyanide	0.34 - 0.5
Lead	0.5
Nickel	0.25 - 0.5
	5
Zinc	0.08 - 0.5
Chloroform	10
2,4-Dichlorophenol	64
2,4-Dinitrophenol	150
Phenol	4
	4 - 10

Pollutant	Reported Range of Anaerobic Digestion Inhibition Threshold Levels, mg/L
Ammonia	1500 - 8000
Arsenic	1.6
Cadmium	20
Chromium (III)	130
Chromium (VI)	110
Copper	40
Cyanide	4 - 100
	1 - 4
Lead	340
Nickel	10
	136
Silver	13 - 65**
Sulfate	500 - 1000
Sulfide	50 - 100
Zinc	400
Acrylonitrile	5
	5
Carbon Tetrachloride	2.9 - 159.4
	10 - 20
	2.0
Chlorobenzene	0.96 - 3
	0.96
Chloroform	1
	5 - 16
	10 - 16
1,2-Dichlorobenzene	0.23 - 3.8
	0.23
1,4-Dichlorobenzene	1.4 - 5.3
	1.4
Methyl chloride	3.3 - 536.4
	100
Pentachlorophenol	0.2
	0.2 - 1.8
Tetrachloroethylene	20
Trichloroethylene	1 - 20
	20
	20
Trichlorofluoromethane	-

* Total pollutant inhibition levels, unless otherwise indicated.
** Dissolved metal inhibition levels.

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