WHEN RECORDED, RETURN TO:

City of Tolleson
City Clerk
9055 West Van Buren Street
Tolleson, Arizona 85353

ORDINANCE NO. 619 N.S.

AN ORDINANCE OF THE MAYOR AND CITY COUNCIL OF THE CITY OF TOLLESON, ARIZONA ADOPTING THE APRIL 29, 2024 CITY OF TOLLESON WASTEWATER TREATMENT PLANT LOCAL LIMITS EVALUATION REPORT AND THE FINAL PROPOSED LOCAL LIMITS CONTAINED THEREIN; PROVIDING FOR REPEAL OF CONFLICTING ORDINANCES; PROVIDING FOR SEVERABILITY; PROVIDING FOR INCORPORATION OF EXHIBITS; AND DECLARING AN EMERGENCY.

WHEREAS, the City of Tolleson ("City") operates a Publicly Owned Treatment Works ("POTW") to provide wastewater treatment services to residential, commercial, and industrial users; and

WHEREAS, the discharge of pollutants by industrial users into the POTW must be regulated to protect the integrity and performance of the wastewater treatment system and to ensure compliance with the Clean Water Act, 33 U.S.C. §1251 et seq.; and

WHEREAS, the City commissioned Brown and Caldwell ("BC") to conduct a technical evaluation of the POTW's treatment capabilities and local limits; and

WHEREAS, on April 29, 2024, BC finalized a local limits evaluation report that contains final proposed local limits for industrial users, as set forth in Exhibit A; and

WHEREAS, the proposed local limits are consistent with applicable state and federal pretreatment regulations (40 C.F.R. Part 403) and were approved by the Arizona Department of Environmental Quality on March 13, 2025 after public notice and comment as required.

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF TOLLESON, ARIZONA, as follows:

Section 1. Adoption of Updated Local Limits. The April 29, 2024 City of Tolleson Wastewater Treatment Plant Local Limits Evaluation Report and the final proposed local limits

contained therein, as set forth in Exhibit A, are adopted by the City and made effective as to all the POTW's industrial users.

Section 2. Providing for Repeal of Conflicting Ordinances. All ordinances, parts of ordinances and resolutions in conflict with the provisions of this Ordinance, or any part of the City Code adopted here by reference, are repealed.

Section 3. Providing for Severability. If any provision of this Ordinance is for any reason held by any court of competent jurisdiction to be unenforceable, such provision or portion hereof shall be deemed separate, distinct, and independent of all other provisions and such holding shall not affect the validity of the remaining portions of this Ordinance.

Section 4. Providing for Incorporation of Exhibits. The exhibits attached to this Ordinance are incorporated herein and made a part of this Ordinance as if set forth herein in full.

Section 5. Declaring Emergency. In the interests of preserving the peace, health and safety of the City, an emergency is declared to exist, and this Ordinance shall become immediately operative and in force.

PASSED AND ADOPTED by the Mayor and Council of the City of Tolleson, Arizona this 22nd day of April, 2025.

_____
Juan F. Rodriguez, Mayor

ATTEST: _____
Crystal Zamora, City Clerk

APPROVED AS TO FORM: _____
Justin Pierce, City Attorney

EXHIBIT A

TO

ORDINANCE NO. 619 N.S.

[April 29, 2024 - City of Tolleson Wastewater Treatment Plan Local Limits Evaluation]

See following pages.

Local Limits Evaluation
City of Tolleson Wastewater Treatment Plant

Prepared for
City of Tolleson
Tolleson, AZ
April 29, 2024

Local Limits Evaluation
City of Tolleson Wastewater Treatment Plant

Prepared for
City of Tolleson
Tolleson, AZ
April 29, 2024

FINAL

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Phoenix, AZ 85004
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List of Abbreviations

ADEQ	Arizona Department of Environmental Quality
AHL	allowable headworks loading
AIR	ammonia impact ratio
APP	Aquifer Protection Permit
AZPDES	Arizona Pollutant Discharge Elimination System
BC	Brown and Caldwell
BOD	biochemical oxygen demand
COC	chain of custody
EDD	electronic data deliverable
EPA	Environmental Protection Agency
IU	Industrial User
LCS	laboratory control sample
LLE	Local Limits Evaluation
MAHL	maximum allowable headworks loading
MAIL	maximum allowable industrial loading
MDL	method detection limit
mgd	million gallons per day
MS	matrix spike
MSD	matrix spike duplicate
NPDES	National Pollutant Discharge Elimination System
POC	Pollutant of Concern
POTW	Publicly Owned Treatment Works
PTL	pass through limit
PVNGS	Palo Verde Nuclear Generation Station
QA	quality assurance
QC	quality control
RL	reporting limit
SAP	sampling and analysis plan
SBR	sequencing batch reactor
SIU	Significant Industrial User
TSS	total suspended solids
UV	ultraviolet
WQS	Water Quality Standard
WWTP	wastewater treatment plant

Executive Summary

Brown and Caldwell (BC) conducted a Local Limits Evaluation (LLE) of the City of Tolleson, Arizona (City or Tolleson) wastewater treatment plant (WWTP) in accordance with the procedures established by the United States Environmental Protection Agency (EPA) and Arizona Department of Environmental Quality (ADEQ). This report provides BC's recommendations and rationale for the revision or development of local limits for discharges to the Tolleson WWTP. Important findings noted during the evaluation are also provided.

Applied Methodology and Approach

This LLE was prepared in accordance with ADEQ and EPA requirements. Details on the applied methodology, assumptions, and approach used during development of the proposed new local limits for the WWTP are described below.

- Potential pollutants of concern (POCs) were selected based on the following criteria:
  - EPA's 15 National POCs
  - Existing Local Limits and previous POCs
  - Revised Arizona Pollutant Discharge Elimination System (AZPDES) permit limits and Aquifer Protection permit (APP) limits
  - Sludge quality
  - Water quality standards (WQS)
  - Prevention of treatment plant process interference or inhibition
  - Worker protection
- Historical data were assessed to identify the POCs.
- Site-specific removal efficiencies were calculated for the POCs based on WWTP influent and effluent analytical results from sampling conducted March 5, 2019 through August 31, 2023. If a removal efficiency could not be calculated using the sampling results, literature values were used. Site-specific removal efficiencies were calculated for BOD and TSS using data from January 2023 through December 2023 to best represent plant operations.
- Allowable headworks loadings (AHLs) were calculated based on design criteria, permit limits, trickling filter inhibition, nitrification inhibition, anaerobic digestion inhibition, sludge disposal criteria, and Arizona WQS.
- The most stringent AHL was designated as the maximum allowable headworks loading (MAHL). A five percent (5%) safety factor was applied to Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) as the WWTP is designed to remove these pollutants, and a ten percent (10%) safety and growth factor was applied to all other pollutants. The domestic and commercial loading from site-specific collection system sampling conducted June 20, 2023 through July 19, 2023 was subtracted from the MAHL to calculate the maximum allowable industrial loading (MAIL) for each POC.
- Updated domestic and commercial loadings from additional sampling conducted December 8, 2023 through December 13, 2023 were used to calculate the MAILs for BOD and TSS.

- For POCs with no existing local limit and where the influent loading was below 60% of the calculated MAHL, no new local limit is needed.

Important Findings of the LLE

The City is requesting the approval of the MAILs to allocate site-specific local limits as needed in either mass- or concentration- based limits. A summary of the current limits and recommended MAILs are presented in Table ES-1.

Table ES-1. Summary of Local Limits for City of Tolleson

Pollutant	Existing Local Limits as MAIL (lb/day)	Existing Local Limits (mg/L)	Recommended Local Limits as MAIL (lb/day)
Ammonia (as N)	---	30[1]	1,235
Biochemical Oxygen Demand (BOD), monthly average	---	---	27,407
Biochemical Oxygen Demand (BOD), daily maximum	---	500[2]	41,812
Suspended Solids, Total (TSS)	---	500[2]	22,181
Arsenic	0.412	0.04	1.08
Bis (2-ethylhexyl) phthalate	0.477	0.04	0.612
Boron	39.8	3.5	27.9
Cadmium	0.546	0.05	0.170
Chromium	10.3	0.92	10.4
Copper	5.35	0.48	4.31
Cyanide	0.723	0.06	0.185
Lead	3.73	0.33	0.712
Mercury	---[5]	0.0002	---[3]
Molybdenum	1.55	0.14	0.344
Nickel	NL	NL	5.66
Selenium	0.036	0.003	0.217
Silver	1.79	0.16	1.67
Zinc	22.0	1.9	7.32
Oil and Grease	---	100	---[4]
pH	---	6.0-10.5 S.U.	---[4]
Dissolved Sulfides	---	0.5	---[4]
Total Sulfides	---	10	---[4]

[1] Recommended alert level for monitoring

[2] Alert limit that will trigger evaluation of the total SIU load and impact on the treatment plant capacity

[3] The calculated MAIL for mercury is negative due to the domestic loading exceeding the MAHL. A uniform concentration local limit of 0.00004 mg/L will be set based upon maximum recorded background concentrations.

[4] The current local limit will be maintained

[5] Existing MAIL is negative due to the domestic loading exceeding the existing MAHL

Section 1

Introduction

EPA's general pretreatment regulations in 40 CFR 403.5(c) require approved pretreatment programs to develop and enforce local limits to implement the general and specific prohibitions of the pretreatment program. Local limits must also be periodically evaluated and revised as necessary to ensure they are protective of the publicly owned treatment works (POTW), receiving stream, and worker health and safety.

Tolleson currently administers an approved pretreatment program with five (5) permitted significant industrial users (SIUs). The last local limits evaluation (LLE) was conducted in 2010 and was based upon data from 2009. Tolleson received a new Arizona Pollutant Discharge Elimination System (AZPDES) permit, which became effective on December 11, 2020. Tolleson's local limits were evaluated to take into account changes to the AZPDES permit, and any other conditions that have changed since the local limits were last calculated.

This Local Limits Evaluation (LLE) is a technical and detailed evaluation of the local limits developed specifically for the City of Tolleson.

1.1 Project Objective

The objective of this effort was to update industrial local limits for the WWTP to enforce the specific and general prohibitions as well as state and local regulations, address site-specific concerns, and protect worker health and safety. The specific and general prohibitions, along with categorical standards, are designed to provide a minimum acceptable level of control over industrial user discharges. Local limits are established to provide additional control to prevent site-specific and environmental impacts due to non-domestic discharges. Therefore, this LLE used site-specific data to identify POCs that may be expected to be discharged in quantities sufficient to cause deleterious impacts at the POTW or to the environment. Some of the factors considered in developing local limits included:

- Efficiency of the WWTP in treating wastes
- Compliance with permit
- Condition of the water body that receives treated effluent
- State and/or federal WQS that are applicable to the water body receiving treated effluent
- Retention, use, and disposal of sewage sludge
- Worker health and safety concerns.

This LLE provides documentation and reasoned guidance on the following:

- Determining POCs
- Gathering and analyzing data
- Calculating allowable headworks loadings (AHLs) for each POC based on applicable criteria
- Determining maximum allowable headworks loadings (MAHLs) and maximum allowable industrial loadings (MAILs) for each POC
- Comparing industrial loadings to MAILs to ensure that local limits meet the needs of the industries to the extent possible.

1.2 Organization of Report

This LLE report is organized into seven sections as follows:

- **Section 1** is an introduction to the LLE and describes the project objectives.
- **Section 2** describes how POCs were chosen for inclusion in the LLE.
- **Section 3** provides details regarding the development of local limits for WWTP.
- **Section 4** discusses the industrial allocations.
- **Section 5** lists the final proposed local limits.
- **Section 6** provides the limitations.
- **Section 7** lists the references.

A large volume of data and calculations was utilized to complete the LLE for Tolleson, including site-specific data, literature values, and calculation spreadsheets. The tables and appendices of this LLE contain the information needed to reproduce the local limits.

The following data and calculation spreadsheets can be found in the appendices to this LLE:

- **Appendix A** contains the regulatory limits and/or criteria applicable to the WWTP, including the following:
  - Design-based wastewater treatment plant capacity criteria. (Table A1)
  - AZPDES permit limits (Table A2)
  - AZPDES aquifer protection permit limits (Table A3)
  - Biosolids regulatory limits (Table A4)
  - WQS for the WWTP's receiving water (Table A5)
- **Appendix B** contains the literature data used in the LLE when site-specific data were not available. Included in this appendix are the following:
  - Removal efficiencies for priority pollutants through primary and secondary treatment processes (Tables B1 and B2)
  - Treatment inhibition threshold levels for trickling filters (Table B3)
  - Treatment inhibition threshold levels for nitrification (Table B4)
  - Treatment Inhibition threshold levels for anaerobic digestion (Table B5)
  - Domestic and commercial pollutant loadings (Table B6)
  - Worker protection screening levels based on fume toxicity and explosivity (Table B7)
- **Appendix C** contains site-specific WWTP data used to develop the local limits. Included in this appendix are the following:
  - Daily pH and temperature data for WWTP effluent flows and corresponding calculated ammonia WQS (Table C1)
  - Daily BOD loadings highlighting exceedances of design criteria (Table C2)
- **Appendix D** contains site-specific WWTP data used to develop the local limits. Included in this appendix are the following:
  - Daily data for the WWTP flows (Table D1)
  - Monthly maximum and average data for the industrial flows (Table D2)

  - Concentrations of conventional POCs in influent and effluent samples collected from January 2023 to December 2023 (Table D3)
  - Concentrations of non-conventional POCs in influent and effluent samples collected from March 5, 2019 to August 30, 2022 (Table D4)
  - Concentrations of domestic and commercial background samples collected from June 20, 2023 to July 19, 2023 (Table D5)
  - BOD and TSS concentrations of domestic and commercial background samples collected from December 6, 2023 to December 13, 2023 (Table D6)
  - Removal efficiencies calculated for conventional and non-conventional pollutants based on average influent and effluent concentrations from the WWTP (Tables D3 and D4)
- **Appendix E** contains the AHL and MAIL calculations.

Section 2

Pollutants of Concern

A POC is any pollutant that may be expected to be discharged to the POTW in sufficient amounts to cause pass-through, interference, or present risk to workers and the environment. Pollutants that are contributing to or known to cause operational issues (i.e., inhibition of a treatment process) are considered POCs even if the pollutants are not currently causing permit violations.

Historical data was reviewed and was found to be sufficient to identify POCs. Results of WWTP influent, effluent, and sludge sampling were compared with regulatory, WWTP-specific, and literature-based criteria levels to determine if a pollutant is a POC. POCs selected for a headworks loading analysis are listed in Table 2-1 and were identified using applicable EPA screening criteria contained in EPA's *Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program* (EPA 1987) and *Local Limits Development Guidance Manual* (EPA 2004).

This section describes how POCs were chosen for inclusion in the LLE and the general methodology followed through the evaluation.

2.1 Initial Pollutants of Concern Selection

The initial selection process for POCs includes the following criteria:

- **EPA POCs:** These include arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, silver, zinc, molybdenum, selenium, 5-day BOD, TSS, and ammonia as nitrogen (for plants that accept non-domestic sources of ammonia).
- **Regulatory permit limits:** Effluent from the WWTP is regulated through APP permit 100339, AZPDES permit AZ0020338, and the Type 2 Recycled Water General Permit for Class B Reclaimed Water. Pollutants regulated in these permits were identified as POCs.
- **Sludge quality:** Because the City land applies biosolids, pollutants from EPA's Table 3 of 40 CFR 503.13 were identified as POCs.
- **Existing local limits:** For re-evaluation of local limits, any existing local limit will be re-assessed to establish if the limit is still required or requires revision based on changes in loadings, changes to the WWTP, or any other criteria.

2.2 Additional Pollutants of Concern Identification

Additional POCs may be identified based on the following factors:

- **Water quality standards:** Water quality standards (WQS) have been developed by EPA and ADEQ for protection of surface waters, including the receiving waters for permitted dischargers. The POTW does not have to develop a local limit for every pollutant for which a water quality standard or criterion exists. However, EPA recommends that any pollutant that has a reasonable potential to be discharged in amounts that could exceed WQS or criteria should be considered a POC and evaluated accordingly.
- **Inhibition:** The General Pretreatment Regulations prohibit any user of a POTW from discharging pollutants that cause interference. EPA recommends that the POTW consider pollutants that have previously interfered with or may potentially interfere with the treatment works' operation

to be a potential POC. These recommendations have been considered in the identification of POCs identified for the WWTP.

- **Worker protection standards:** The EPA has established worker protection standards for pollutants discharged to the WWTP. Influent screening is conducted to identify pollutants detected at the POTW to determine, based on the pollutant's concentration, if the pollutant should be selected as a POC for which local limits are developed.

2.2.1 Sampling and Analysis for POC Identification

Site-specific data is necessary to identify any additional POCs based on the potential for exceeding WQS, causing or contributing to inhibition, or presenting risks to worker health and safety. Table 4-1 of EPA's 2004 *Local Limits Development Guidance Manual* provides the minimum recommended samples for local limits development.

Historical results from priority pollutant scans of the WWTP's influent, effluent, and sludge were evaluated as part of the POC selection to identify any additional POCs. Historical data from 2019-2022 was assessed, and most parameters had at least 10 influent and effluent results. The dataset included ongoing sampling as required in Tolleson's AZPDES permit.

2.2.2 Priority Pollutant Scans

Historical data were evaluated as part of the POC selection process to identify any additional POCs. Results with detected values were evaluated based on the criteria below, which is derived from guidance in EPA's 1987 *Guidance Manual on the Development and Implementation of Local Discharge Limitation Under the Pretreatment Program*. If a pollutant meets the following criteria, it is generally considered a POC.

- **Influent scans:**
  - If the maximum influent concentration is greater than the most stringent water quality standard (WQS), adjusted for dilution, for that pollutant. Influent exceedances of WQS alone do not necessarily indicate that the parameter is a POC. If sufficient effluent data is available to indicate there is no reasonable potential to violate WQS, the POCs based only on influent exceedances of WQS can be screened out.
  - If the maximum influent grab concentration is greater than one half of the inhibition threshold value or the maximum influent composite concentration is greater than one fourth of the inhibition threshold value
  - If the maximum influent concentration is greater than one five-hundredth of the associated biosolids criteria
  - If the maximum influent concentration exceeds the worker protection value
- **Effluent scans:**
  - If the maximum effluent concentration is greater than one half of the allowable effluent concentration required to meet WQS
- **Sludge scans:**
  - If the maximum sludge concentration is more than half of the sludge criteria

2.3 POC Screening: Final Assessment

Pollutants initially identified as POCs can be eliminated through the POC screening process if sufficient data exists to indicate there is no reasonable potential to violate standards or adversely affect the POTW.

2.3.1 Elimination of Permitted Parameters as POCs

Several pollutants from Tolleson's APP had over ten data points for the influent and effluent and were all non-detect at a reporting or detection limit well below the APP limit. These parameters were removed from the list of POCs.

2.3.2 Elimination of Other POCs Identified in Priority Pollutant Scans

Influent

Benzidine was the only pollutant detected in the influent that exceeded a WQS. However, only one influent sample was greater than the WQS, and all nine other influent samples were non-detect for benzidine. Additionally, all ten effluent results were below the detection level. This parameter was not included in the list of POCs.

Effluent

3,3'-Dichlorobenzidine, alpha-BHC, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and benzo[k]fluoranthene were detected in the effluent at a value greater than half the most stringent WQS. However, it should be noted that these detections were below the method reporting limit and qualified by the laboratory as estimated, and all other influent and effluent samples (19 or more) for each parameter were non-detect. Because of this, these parameters were not considered POCs.

Multiple results for bromodichloromethane and dibromochloromethane exceeded half of the most stringent WQS. Because these parameters are disinfection byproducts, and there were no influent detections, these parameters were not considered POCs.

2.3.3 Elimination of Other POCs Following Additional Sampling

Cis-1,2,-dichloroethylene, styrene, and xylene were eliminated by demonstration through influent and effluent monitoring that samples were consistently non-detectable.

2.3.4 Prohibited Pollutants

The following pollutants are currently prohibited from discharge according to the 2010 Local Limits Update Study: aldrin, DDD, DDE, heptachlor, heptachlor epoxide, alpha-BHC, beta-BHC, lindane, PCBs.

Chlordane, DDT, dieldrin, and toxaphene have very low AZPDES permit limits and WQS. Because the reasonable potential to violate permit limits or WQS is indeterminate due to a higher reporting limit, these parameters have been added to the list of prohibited pollutants.

2.3.5 Final Pollutants of Concern

Table 2-1 below lists the POCs for which a headworks analysis will be conducted as part of the LLE.

Table 2-1. Pollutants of Concern

Pollutant	Criteria
Ammonia	Previous Local Limits; AZPDES Permit Limit

Table 2-1. Pollutants of Concern	
Pollutant	Criteria
Antimony	APP Limit
Arsenic	Previous Local Limits; APP Limit
Barium	APP Limit
Beryllium	APP Limit
Bis(2-ethylhexyl) phthalate	Previous Local Limits
BOD	Previous Local Limits; AZPDES Permit Limit
Boron	Previous Local Limits; AZPDES Permit Limit
Cadmium	Previous Local Limits; APP Limit
Chromium	Previous Local Limits; APP Limit
Copper	Previous Local Limits; AZPDES Permit Limit
Cyanide	Previous Local Limits; AZPDES Permit Limit
Fluoride	APP Limit
Iron	AZPDES Permit Limit
Lead	Previous Local Limits; APP Limit
Mercury	Previous Local Limits; AZPDES Permit Limit; APP Limit
Molybdenum	Previous Local Limits
Nickel	EPA POC; APP Limit
Oil and Grease	Previous Local Limits; AZPDES Permit Limit
Selenium	Previous Local Limits; AZPDES Permit Limit; APP Limit
Silver	Previous Local Limits
Thallium	Reasonable potential to exceed WQS; APP Limit
TSS	Previous Local Limits; AZPDES Permit Limit
Zinc	Previous Local Limits

Section 3

Local Limits Development

The primary objective of this section is to describe the methodologies used to develop local limits. Included in this section are descriptions of AHL calculations based on various environmental criteria, including:

- Design criteria
- NPDES permit limits
- APP limits
- Water Quality Standards
- Trickling filter treatment inhibition
- Nitrification inhibition
- Anaerobic Digestion inhibition
- Biosolids limits

Also included in this section are references to data sources used for calculating AHLs and the rationale for assumptions. Results of AHL calculations, determinations of the MAHLs, and calculations for MAILs are also provided.

3.1 Background

The WWTP is located at 9501 W. Pima Street, Tolleson, Arizona (Figure 3-1). The majority of the effluent from the WWTP discharges to the Palo Verde Nuclear Generation Station (PVNGS) to be used as cooling water. The remaining effluent is retained at the WWTP and is used for irrigation, which is regulated under the Arizona Department of Environmental Quality (ADEQ) Type 2 Recycled Water General Permit for Class B Reclaimed Water. The City is also authorized to discharge to the Salt River under AZPDES permit AZ0020338. Effluent discharges to the Salt River are infrequent and only occur when PVNGS is shut down for maintenance or repairs or otherwise does not accept the WWTP effluent.

Figure 3-1. Google Earth image of the City of Tolleson WWTP

Imagery Date October 12, 2023

3.1.1 Permits

The WWTP is authorized to discharge treated wastewater to the Salt River under AZPDES Permit Number AZ0020338, which became effective December 11, 2020 and expires on December 10, 2025. The permitted design flow for the WWTP is 17.5 million gallons per day (mgd) as provided in the NPDES permit. Effluent used for irrigation is regulated under the Arizona Department of Environmental Quality (ADEQ) Type 2 Recycled Water General Permit for Class B Reclaimed Water.

Tolleson is also subject to ADEQ Aquifer Protection Permit (APP), 100339 for the WWTP, effluent holding pond, effluent outfall at the Salt River, and the sludge drying beds.

3.1.2 Treatment Processes

The Tolleson WWTP is designed to treat 17.5 mgd. Primary treatment consists of mechanical bar screens, grit removal, and primary clarifiers. Secondary treatment includes filtrate equalization basins, first-stage trickling filters, intermediate clarifiers, second-stage trickling filters, aeration basins, solids contact channel, and secondary clarifiers followed by disinfection. Solids treatment consists of primary sludge/scum pumps, rotary drum thickeners, thickened secondary sludge pumps, low pressure hot water boilers, fixed covered anaerobic digesters, digested sludge storage tank with gas holding cover, facultative sludge basin, belt filter presses, drying beds, and biosolids storage pad.

3.2 Site-Specific Flows and Removal Efficiencies

Average flow rates are used to calculate AHLs for all criteria. All applicable LLE flows for the WWTP are summarized in Appendix D, Table D1. The average plant flow of 5.73 mgd was calculated from the daily flows from January 2023 through December 2023.

Site-specific removal efficiencies, R_{WWTP}, were calculated using historic data and data from influent and effluent sampling conducted at the WWTP May 30 through August 30, 2023, as presented in Tables D3 and D4. If an appropriate removal efficiency could not be calculated from the sampling data (e.g., if all results are non-detect), literature values were used. Removal efficiencies for BOD and TSS were calculated using plant data from January 2023 through December 2023.

Median literature values from EPA's Local Limits Development Guidance Manual (EPA 2004) were used for secondary removal efficiencies for lead and nickel due to non-detects. These values are provided as a reference in Appendix B, Table B2. Literature values for primary removal efficiencies, as reported by other POTWs in studies that have been published in professional journals or by EPA, were used in developing local limits. These literature-based data are presented in Appendix R of EPA's *Local Limits Development Guidance Manual* (EPA 2004) and can be found in Appendix B, Table B1.

3.3 Calculation of AHLs Based on Permit Limits

An effective means of restricting the discharge of pollutants into receiving waters is through an NPDES permit limit. NPDES is the permitting system established by the Clean Water Act that regulates the discharge of pollutants into the waters of the United States. NPDES permit limits applied to discharges from the WWTP are used in the derivation of local limits to prevent pollutant pass-through.

The WWTP's NPDES permit includes monthly average, weekly average, and daily maximum discharge limitations for POCs outlined in Table A2 of Appendix A. EPA recommends that only the more conservative monthly average concentrations be used in calculating NPDES-based AHLs. Monthly average permit limits were used to calculate AHLs for POCs for which a value exists.

Aquifer Protection Permit No. P-100339, effective September 24, 2013, also includes discharge limits that the WWTP must meet. These limits were included in the AHL calculations.

As illustrated in Equation 3-1, an AHL based on an NPDES permit limit or APP limit (AHL_{NPDES}) is the pollutant loading at the WWTP flow (C_{NPDES} * Q_{WWTP}) divided by the fraction of the pollutant not removed by the plant (1 – R_{WWTP}).

Equation 3-1

$$AHL_{NPDES} = \frac{(8.34)(C_{NPDES})(Q_{WWTP})}{(1-R_{WWTP})}$$

Where:

AHL_{NPDES}	= AHL based on NPDES permit limit or APP limit, lb/day
C_{NPDES}	= NPDES permit limit or APP limit, mg/L
Q_{WWTP}	= WWTP average flow rate, mgd
R_{WWTP}	= Plant removal efficiency from headworks to plant effluent, as decimal
8.34	= Conversion factor, lb/gal

3.3.1 Data Sources and Assumptions

Calculations were performed based on the following components.

Flow Rates. Average flow from Appendix D, Table D1 for the WWTP was used in this calculation: Q_{WWTP}, 5.73 mgd.

Permit Limits. WWTP NPDES and APP permit limits for POCs, C_{NPDES}, are shown in Appendix A, Tables A2 through A3.

Plant Removal Efficiencies. Site-specific removal efficiencies, R_{WWTP}, described in 3.2, were used in this calculation. Median literature values were used for lead and nickel.

3.3.2 Calculation Results

AHLs based on the NPDES permit and APP were calculated only for those pollutants with established permit limits. A summary of these AHLs is provided in Appendix E, Table E9.

3.4 Calculation of AHLs Based on Water Quality Standards

WQS established by ADEQ were used to calculate AHLs for the protection of the receiving stream. As illustrated in Equation 3-2, AHLs based on state WQS (AHL_{WQS}) are calculated as the pollutant loading to the water body at the water quality limit [C_{WQS} (Q_{STR} + Q_{WWTP})], adjusted for the background loading of the water body (C_{STR} * Q_{STR}), and divided by the fraction of the pollutant not removed by the plant (1 – R_{WWTP}).

Equation 3-2

$$AHL_{WQS} = \frac{(8.34)[C_{WQS}(Q_{STR}+Q_{WWTP})-(C_{STR}*Q_{STR})]}{(1-R_{WWTP})}$$

Where:

AHL_{WQS}	= AHL based on state WQS, lb/day
C_{STR}	= Receiving stream background concentration, mg/L
C_{WQS}	= In-stream state WQS, mg/L
Q_{STR}	= Receiving stream (upstream) flow rate, mgd
Q_{WWTP}	= WWTP average flow rate, mgd
R_{WWTP}	= Plant removal efficiency from headworks to plant effluent, as decimal
8.34	= Conversion factor, lb/gal

3.4.1 Data Sources and Assumptions

AHLs based on WQS were calculated using Equation 3-2. The following data sources and assumptions were used.

3.4.1.1 Receiving Stream Flow Rates

The AZ0020338 permit fact sheet notes that Arizona state water quality rules require that WQS be achieved without mixing zones unless the permittee applies for and is approved for a mixing zone. Since a mixing zone was not applied for or granted for any outfalls, and the receiving stream is ephemeral prior to discharge, all water quality criteria are applied at end-of-pipe. A stream flow of zero (0) mgd was used in the calculations.

3.4.1.2 Water Quality Standards

As noted in the AZ0020338 permit fact sheet, the designated uses for the Salt River are Aquatic and Wildlife effluent dependent water (A&Wedw), Partial Body Contact (PBC), Fish Consumption (FC), Agricultural Irrigation (AgI), Agricultural Livestock watering (AgL). The WQS from *Arizona Administrative Code, Title 18, Chapter 11 – Water Quality Standards* for these use classifications were used in the calculations. These values are provided in Appendix A, Table A5.

Ammonia water quality criteria are dependent on the pH and temperature of the effluent at the time of sampling. To account for this, ADEQ developed a monthly average ammonia impact ratio (AIR) limit of 1, where the AIR is calculated by dividing the ammonia concentration in the effluent by the applicable ammonia standard based on the effluent pH and temperature at the time of sampling.

In order to develop an AHL based on ammonia water quality, a single ammonia water quality criterion is needed. Using the equation from Table 16 of the *Arizona Administrative Code, Title 18, Chapter 11 – Water Quality Standards* shown below, a chronic ammonia water quality criterion was calculated for each day from October 2022 through September 2023 using the corresponding temperature and pH from that day. To be conservative, the lowest calculated water quality standard was used to develop the water quality-based ammonia AHL. The calculations are shown in Appendix C, Table 1.

$$0.9405 \times \left(\frac{0.020278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times \left(7.547 \times 10^{0.028\times(20-MAX(T,7))}\right)$$

Arizona also has numeric aquifer WQS that apply to aquifers that are classified for drinking water protected use. Tolleson's Aquifer Protection Permit discharge limits are equivalent to the aquifer WQS in *Arizona Administrative Code, Title 18, Chapter 11 – Water Quality Standards.* Because a mixing zone is not applied in the AHL calculations for WQS, the calculations for AHLs based on aquifer WQS would be the same as the calculations for AHLs based on Aquifer Protection Permit discharge limits. For this reason, AHL calculations for aquifer WQS were not included.

3.4.1.3 Upstream Background Concentrations

Because all water quality criteria are applied at end-of-pipe, no upstream background concentrations were used in the calculations.

3.4.1.4 Flow Rates

Average Flow from Appendix D, Table D1 for the WWTP were used in this calculation: Q_{WWTP}, 5.73 mgd.

3.4.2 Calculation Results

The final state WQS for POCs are listed in Appendix A, Table A5. The data and calculation results for the AHLs to ensure compliance with the WQS at the WWTP are provided in Appendix E. AHLs based on WQS were calculated only for those pollutants with established standards or criteria. A summary of AHLs based on WQS is provided in Appendix E.

3.5 Calculation of AHLs Based on Trickling Filter Treatment Inhibition

Inhibition-based AHLs were calculated to protect against operational problems for biological treatment processes during secondary and treatment. This inhibition can interfere with a POTW's ability to remove pollutants, including BOD. EPA does not require POTWs to calculate AHLs based on inhibition threshold levels if current loadings are acceptable to the treatment processes. For the WWTP, AHLs were calculated to prevent future loadings that may cause inhibition.

As illustrated in Equation 3-3, the AHL based on inhibition of trickling filter treatment (AHL_{INHIB1}) is calculated by dividing the pollutant loading to the secondary treatment unit at the inhibition criterion (C_{INHIB1} * Q_{WWTP}) by the fraction of the pollutant not removed after primary treatment (1 - R_{PRIM}).

Equation 3-3

$$AHL_{INH1} = \frac{(8.34)(C_{INHIB1})(Q_{WWTP})}{(1-R_{PRIM})}$$

Where:

AHL_{INHIB1} = AHL based on inhibition of trickling filter treatment, lb/day
C_{INHIB1} = Inhibition criterion for trickling filter treatment, mg/L
Q_{WWTP} = WWTP average flow rate, mgd

R_{PRIM} = Removal efficiency from headworks to primary treatment effluent, decimal
8.34 = Conversion factor, lb/gal

3.5.1 Data Sources and Assumptions

AHLs based on trickling filter treatment inhibition were calculated using Equation 3-3. The following data sources and assumptions were used.

Trickling Filter Treatment Inhibition Thresholds. Inhibition threshold levels have been reported at other POTWs, as provided in EPA's *Local Limits Development Guidance Manual* (EPA 2004). These literature-based inhibition threshold levels for trickling filter treatment, C_{INHIB1}, are provided in Appendix B, Table B3. Site-specific inhibition threshold levels were not available. Therefore, all inhibition threshold levels are based on literature values. Where the literature provided a range of inhibition thresholds values, the median reported threshold levels were used in calculating the AHLs.

Flow Rate. Average flow from Appendix D, Table D1 for the WWTP was used in this calculation: Q_{WWTP}, 5.73 mgd.

Primary Removal Efficiencies. Primary removal efficiencies reported by other POTWs in studies that have been published in professional journals or by EPA were used calculating the AHLs. These literature-based data are presented in Appendix R of EPA's *Local Limits Development Guidance Manual* (EPA 2004) and can be found in Appendix B, Table B1.

3.5.2 Calculation Results

The data and calculation results for the AHLs to protect against trickling filter treatment inhibition at the WWTP are provided in Appendix E, Table E4. A summary of AHLs based on trickling filter treatment inhibition is provided in Appendix E, Table E9.

3.6 Calculation of AHLs Based on Nitrification Inhibition

Inhibition-based AHLs were calculated to protect against operational problems for nitrification. EPA does not require POTWs to calculate AHLs based on inhibition threshold levels if current loadings are acceptable to the treatment processes. For the WWTP, AHLs were calculated to prevent future loadings that may cause inhibition.

As illustrated in Equation 3-4, the AHL based on inhibition of nitrification (AHL_{INHIB2}) is calculated by dividing the pollutant loading to the secondary treatment unit at the inhibition criterion (C_{INHIB2} * Q_{WWTP}) by the fraction of the pollutant not removed after primary treatment (1 - R_{PRIM}).

Equation 3-4

$$AHL_{INHIB2} = \frac{(8.34)(C_{INHIB_2})(Q_{WWTP})}{(1-R_{PRIM})}$$

Where:

AHL_{INHIB2} = AHL based on inhibition of nitrification, lb/day
C_{INHIB2} = Inhibition criterion for nitrification, mg/L
Q_{WWTP} = WWTP average flow rate, mgd
R_{PRIM} = Removal efficiency from headworks to primary treatment effluent, decimal
8.34 = Conversion factor, lb/gal

3.6.1 Data Sources and Assumptions

AHLs based on nitrification inhibition were calculated using Equation 3-4. The following data sources and assumptions were used.

Nitrification Inhibition Thresholds. Inhibition threshold levels have been reported at other POTWs, as provided in EPA's *Local Limits Development Guidance Manual* (EPA 2004). These literature-based inhibition threshold levels for nitrification, C_{INHIB2}, are provided in Appendix B, Table B4. Site-specific inhibition threshold levels were not available. Therefore, all inhibition threshold levels are based on literature values. Where the literature provided a range of inhibition thresholds values, the median reported threshold levels were used in calculating the AHLs.

Flow Rate. Average flow from Appendix D, Table D1 for the WWTP were used in this calculation: Q_{WWTP}, 5.73 mgd.

Primary Removal Efficiencies. Primary removal efficiencies reported by other POTWs in studies that have been published in professional journals or by EPA were used calculating the AHLs. These literature-based data are presented in Appendix R of EPA's *Local Limits Development Guidance Manual* (EPA 2004) and can be found in Appendix B, Table B1.

3.6.2 Calculation Results

The data and calculation results for the AHLs to protect against nitrification inhibition at the WWTP are provided in Appendix E, Table E5. A summary of AHLs based on nitrification inhibition is provided in Appendix E, Table E9.

3.7 Calculation of AHLs Based on Anaerobic Digestion Inhibition

Inhibition-based AHLs were calculated to protect against operational problems for anaerobic digestion. EPA does not require POTWs to calculate AHLs based on inhibition threshold levels if current loadings are acceptable to the treatment processes. For the WWTP, AHLs were calculated to prevent future loadings that may cause inhibition.

As illustrated in Equation 3-5, the AHL based on inhibition of anaerobic digestion (AHL_{INHIB3}) is calculated by dividing the pollutant loading to the digester at the inhibition criterion (C_{INHIB3} * Q_{DIG}) by the fraction of the pollutant removed by the WWTP (R_{WWTP}).

Equation 3-5

$$AHL_{INHIB_3} = \frac{(8.34)(C_{INHIB3})(Q_{DIG})}{(R_{WWTP})}$$

Where:

AHL_{INHIB3}	= AHL based on inhibition of anaerobic digestion, lb/day
C_{INHIB3}	= Inhibition criterion for anaerobic digestion, mg/L
Q_{DIG}	= Digester average flow rate, mgd
R_{WWTP}	= Removal efficiency from headworks to plant effluent, decimal
8.34	= Conversion factor, lb/gal

3.7.1 Data Sources and Assumptions

AHLs based on anaerobic digestion inhibition were calculated using Equation 3-5. The following data sources and assumptions were used.

Anaerobic Digestion Inhibition Thresholds. Inhibition threshold levels have been reported at other POTWs, as provided in EPA's *Local Limits Development Guidance Manual* (EPA 2004). These literature-based inhibition threshold levels for anaerobic digestion, C_{INHIB3}, are provided in Appendix B, Table B5. Site-specific inhibition threshold levels were not available. Therefore, all inhibition threshold levels are based on literature values. Where the literature provided a range of inhibition thresholds values, the median reported threshold levels were used in calculating the AHLs.

Flow Rate. Average flow to the digester was used in this calculation: Q_{DIG}, 0.02 mgd.

Plant Removal Efficiencies. Site-specific removal efficiencies and literature values, R_{WWTP}, described in 3.2, were used in this calculation.

3.7.2 Calculation Results

The data and calculation results for the AHLs to protect against nitrification inhibition at the WWTP are provided in Appendix E, Table E6. A summary of AHLs based on nitrification inhibition is provided in Appendix E, Table E9.

3.8 Calculation of AHLs Based on Design Criteria

Some pollutants such as ammonia, BOD, and TSS require additional evaluation before MAHLs are established because POTWs are typically designed to treat these pollutants. EPA recommends that POTWs develop AHLs based on design criteria when the POTW begins to operate at 80 to 90 percent of its design capacity for 3 to 6 consecutive months. In addition, if the rate of increase in pollutant loadings suggests that the full capacity of the WWTP will be used within 5 to 7 years, then planning to avoid future violations should begin immediately.

As illustrated in Equation 3-6, the AHL based on design criteria (AHL_{DESIGN}) is the design criteria (lb/day).

Equation 3-6 $$AHL_{DESIGN} = DC$$

Where:

AHL_{DESIGN} = AHL based on design criteria, lb/day
DC = Design criteria, lb/day

3.8.1 Data Sources and Assumptions

AHLs based on design criteria were calculated using Equation 3-6. The following data sources and assumptions were used.

Design Criteria. Design loadings from the Brown and Caldwell Ammonia Removal Project Design Report, Section 5.1, Design Flow and Loads, City of Tolleson, 2014, p. 5-1 were used in the calculations.

3.8.2 Calculation Results

The data and calculation results for the AHLs based on design criteria for the WWTP are provided in Table E2, Appendix E. A summary of AHLs is provided in Table E9, Appendix E.

3.9 Calculation of AHLs Based on Sludge Disposal Regulations

Sludge disposal-based AHLs can be calculated for sludge depending on its end use. For example, sludge may be applied to land to condition the soil or fertilize crops, disposed of in a landfill, or incinerated. Sludge from the Tolleson WWTP is either land applied or hauled to the landfill. Therefore, land application concentrations from 40 CFR Part 503 and Table 9 of permit AZ0020338 were used. The concentrations are found in Table A4 of Appendix A.

As illustrated in Equation 3-7, the AHL based on sludge regulations (AHL_{SLUDGE}) is calculated by dividing the pollutant loading of sludge at the sludge standard (C_{SLUDGE} * Q_{SLUDGE}) by the overall plant removal efficiency (R_{WWTP}).

Equation 3-7 $$AHL_{SLUDGE} = \frac{(C_{SLUDGE})(Q_{SLUDGE})(0.0022)}{(R_{WWTP})}$$

Where:

AHL_{SLUDGE}	= AHL based on sludge regulations, lb/day
C_{SLUDGE}	= Most stringent sludge standard, mg/kg-dry
Q_{SLUDGE}	= Total sludge flow to disposal, dry metric tons/day
R_{WWTP}	= Removal efficiency from headworks to final effluent, decimal
0.0022	= Conversion factor

3.9.1 Data Sources and Assumptions

AHLs based on sludge regulations were calculated using Equation 3-7. The sludge criteria used in the equation, C_{SLUDGE}, is the land application criteria listed in Table A4 of Appendix A. The sludge flow was based on data from 2022.

Plant removal efficiencies were applied as discussed in Section 3.2.

3.9.2 Calculation Results

The data and calculation results for the AHLs based on sludge disposal regulations for the WWTP are provided in Table E7, Appendix E. A summary of AHLs based on sludge disposal regulations is provided in Table E9, Appendix E.

3.10 Maximum Allowable Headworks Loadings

Table E9, Appendix E provides a summary of the AHLs calculated to ensure compliance with each of the environmental criteria: design criteria, permit limits, trickling filter treatment inhibition, nitrification inhibition, anaerobic digestion inhibition, sludge disposal and WQS. Table E9, Appendix E identifies the most stringent AHL for each POC, referred to as the MAHL. This loading is the maximum loading the WWTP can accept at the headworks, and it is used to calculate the MAILs and local limits.

EPA recommends that local limits are needed when the current average influent loading of a toxic pollutant exceeds 60 percent of the MAHL or when the maximum daily influent loading of a toxic pollutant exceeds 80 percent of the MAHL any time during the 12-month period preceding the analysis. Equation 3-8 is used to compare the WWTP loadings based on influent concentrations and flow to the calculated MAHLs for individual POCs and can be used to calculate the percentage of the MAHL currently being received at the WWTP. The average influent loading was used in this equation for all POCs.

Equation 3-8 $$L_{\%} = \frac{L_{INFL}}{MAHL} * 100$$

Where: $$L_{INFL} = 8.34 \times Q_{WWTP} \times C_{INFL}$$

and:

$L_{\%}$	=	Percentage of MAHL currently utilized percent
L_{INFL}	=	Current influent loading, lb/day
MAHL	=	Calculated MAHL, lb/day
Q_{WWTP}	=	WWTP average flow rate, mgd
C_{INFL}	=	Average influent pollutant loading, lb/day
8.34	=	Conversion factor, lb/gal

3.10.1 Data Sources and Assumptions

Average influent concentrations were used (Appendix D). Using the average flow rate at the WWTP of 5.73 mgd and the conversion factor 8.34, the average influent concentrations were converted to average influent loadings for use in Equation 3-8.

3.10.2 Calculation Results

Calculated percentages of MAHLs currently received at the WWTP are provided in Appendix E. No new local limits for parameters without existing local limits were developed based on the comparison of current loadings to MAHLs.

3.11 Maximum Allowable Industrial Loadings

The MAIL is the estimated maximum loading of a pollutant that can be received at a POTW's headworks from all permitted industrial users and other controlled sources without causing pass-through or interference. As shown in Equation 3-9, the MAIL is calculated by subtracting estimates of loadings from uncontrolled sources (L_{UNC}), from a MAHL adjusted with a safety and growth factor (SGF).

Equation 3-9 $$MAIL = MAHL(1 - SGF) - (L_{UNC})$$

Where: $$L_{UNC} = (C_{UNC} \times Q_{UNC} \times 8.34)$$

and:

MAIL	=	Maximum allowable industrial loading, lb/day
MAHL	=	Maximum allowable headworks loading, lb/day
L_{UNC}	=	Loadings from uncontrolled sources, lb/day
SGF	=	Safety and growth factor, decimal, if desired
C_{UNC}	=	Domestic and commercial background levels, mg/L
Q_{UNC}	=	Domestic and commercial flow, mgd
8.34	=	Conversion factor, lb/gal

A POTW can then use several basic approaches to assign limits to its controlled or permitted dischargers, including limits based on industrial user contributions of a pollutant, uniform limits for all controlled dischargers, as needed case-by-case, or creative allocation methods. These approaches can vary between POTWs and pollutants. For this LLE, MAILs were calculated so that Tolleson may allocate loadings on a site-specific as-needed basis and re-allocate as necessary without the need for ADEQ review and approval.

3.11.1 Data Sources and Assumptions

Flow Rates. Average WWTP flow from domestic and commercial sources (Q_{UNC}) is 4.94 mgd and was calculated by subtracting total industrial flow, 1.05 mgd, (Q_{IND}) from the WWTP average flow rate (Q_{WWTP}) of 5.73 mgd.

Domestic and Commercial Wastewater Background Concentrations. The average domestic/commercial background concentrations of POCs were calculated using results from background sampling in the Tolleson collection system conducted June 20, 2023 through July 19, 2023. Sample collection sites were selected within the Tolleson collection system that are exclusive to domestic and commercial flows and independent of any industrial contributions.

Safety and Growth Factor. The main purpose of a safety factor is to address data "uncertainties" that can affect the ability of the WWTP to calculate accurate local limits. At a minimum, EPA recommends a 10 percent safety factor. Safety factors can vary between POCs and should depend on the variability of the WWTP's data, amount of data the WWTP used to develop its MAHLs, quality of the WWTP's data, amount of literature data used, history of compliance with the parameter, and potential for industrial user slug loadings (for example, because of a chemical spill or flood event). In addition to the safety factor, a growth factor can be incorporated to account for anticipated growth in the service area from present until the local limits will be reevaluated.

A safety factor of five percent was used in the evaluation for BOD and TSS. A safety factor of 10 percent was used for all other POCs. No additional growth factor was included at the City's discretion.

3.12 BOD and TSS

After reviewing the data, it was determined that the original collection system locations were not representative of the overall domestic and commercial BOD and TSS concentrations discharged to the Tolleson WWTP. Five new collection system locations were selected that were found to be representative of the domestic and commercial contribution, and additional background sampling was conducted between December 6, 2023 and December 13, 2023. The resulting average BOD and TSS concentrations were used to develop representative domestic and commercial loadings in order to calculate MAILs for BOD and TSS.

3.12.1 BOD Design Capacity

The design capacity for the Tolleson WWTP is 40,650 lb/day of BOD. It was determined that this value is overly conservative when developing daily maximum limits for industrial users. Instead, the City proposes to use this design capacity to develop monthly average limits for industrial users.

Daily BOD loadings and removal efficiencies from 2023 were assessed to determine an estimate of the maximum BOD loading that the Tolleson WWTP can sufficiently treat and maintain compliance with effluent limits. More than half of Tolleson's daily influent BOD loadings (35 out of 67 data points) exceeded the design capacity of 40,650 lb/day, including the maximum daily loading of 93,385 pounds on March 21, 2023. No permit exceedances were reported during this time period. The average BOD loading in excess of the rated design capacity is 55,813 lb/day. The City proposes to use this value to calculate the MAIL for BOD which will be allocated as a daily maximum limit.

The daily BOD loading comparison is provided in Table C2 of Appendix C.

3.13 Other Local Limits

3.13.1 Oil and Grease

The pretreatment regulations in 40 CFR 403.5(b)(6) prohibit the discharge of "petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass-through." If treatment inhibition is occurring, WWTPs could calculate oil and grease removal efficiencies, determine inhibition criteria, and determine AHLs based on inhibition. According to EPA, most WWTPs have adopted a limit between 100 and 400 mg/L limit for fats, oil, and grease of animal or vegetable origin as determined by an approved analytical procedure for oil and grease analysis. Tolleson currently uses a 100 mg/L oil and grease limit. The calculated limit developed from the permit limit-based AHL is 914 mg/L. The current oil and grease limit of 100 mg/L will be maintained.

3.13.2 Sulfides

The existing local limits of 0.5 mg/L for dissolved sulfides and 10 mg/L for total sulfides are recommended to be maintained to protection the wastewater collection system and to reduce odor potential in the collection system and WWTP influent. If industrial discharge compliance becomes problematic, the specific sulfide forms in an SIU discharge and their potential for odor and hydrogen sulfide formation should be evaluated.

3.13.3 pH

Besides the low-end pH limit specified in the General Pretreatment Regulations, EPA recommends WRTPs evaluate the need to set upper pH limits or more stringent low-end pH limits. A WWTP should set an upper pH limit if corrosion damage attributable to high-pH discharges is identified. An upper limit pH of up to 12.5 may be an appropriate upper limit in lieu of any identified high pH corrosion concerns. However, because wastewater of pH 12.5 or higher is considered a hazardous waste (exhibiting the characteristic of corrosivity) under 40 CFR 261.22(a)(1), additional reporting and liability results when hazardous waste is discharged to a sanitary sewer. The WWTP needs to set an upper pH limit that is protective of the WWTP, but also allows for some margin of safety to avoid characterization as hazardous waste.

Tolleson currently uses the pH range limit of 6.0 to 10.5 S.U. There were no identified issues with the current pH range; therefore, the pH range limit will remain at 6.0 to 10.5 S.U.

3.13.4 Prohibited Pollutants

The following pollutants are currently prohibited from discharge according to the 2010 Local Limits Update Study: aldrin, DDD, DDE, heptachlor, heptachlor epoxide, alpha-BHC, beta-BHC, lindane, PCBs.

Chlordane, DDT, dieldrin, and toxaphene have very low AZPDES permit limits and WQS. Because the reasonable potential to violate permit limits or WQS is indeterminate due to a higher reporting limit, these parameters have been added to the list of prohibited pollutants.

3.14 Summary

The calculated and proposed MAILs that apply to all non-domestic dischargers to the WWTP are provided below. MAILs are proposed for all parameters that had an existing limit. Because the headworks loading analysis for antimony, barium, beryllium, fluoride, iron, and thallium indicates that the influent loadings are well below the corresponding MAHLs, new local limits for these parameters are not needed.

Existing local limits for oil and grease, pH, dissolved sulfides, and total sulfides will be maintained. The following pollutants are specifically prohibited: aldrin, DDD, DDE, heptachlor, heptachlor epoxide, alpha-BHC, beta-BHC, lindane, PCBs, chlordane, DDT, dieldrin, and toxaphene.

Based on this comprehensive evaluation, influent loadings below the proposed limits are not expected to cause interferences with treatment processes at the WWTP. Table 3-1 provides a summary of the proposed MAILs. The basis for each MAIL calculation is also provided. The basis is the most stringent criteria for which AHLs were calculated. Tolleson is requesting approval of the MAILs to allocate to industries on a site-specific, case-by-case basis in either mass- or concentration-based limits.

Table 3--1. Proposed Maximum Allowable Industrial Loadings

Pollutant	Maximum Allowable Industrial Loading (lb/day)	Basis
Ammonia (as N)	1,235	Design Criteria
Biochemical Oxygen Demand (BOD), monthly average	27,407	Design Criteria
Biochemical Oxygen Demand (BOD), daily maximum	41,812	Design Criteria
Suspended Solids, Total (TSS)	22,181	Design Criteria
Arsenic	1.08	Sludge Disposal
Bis (2-ethylhexyl) phthalate	0.612	Discharge Permit Limits
Boron	27.9	Discharge Permit Limits
Cadmium	0.170	Sludge Disposal
Chromium	10.4	Discharge Permit Limits
Copper	4.31	Anaerobic Digestion Inhibition
Cyanide	0.185	Discharge Permit Limits
Lead	0.712	Water Quality Standards
Mercury	*	Discharge Permit Limits
Molybdenum	0.344	Sludge Disposal
Nickel	5.66	Sludge Disposal
Selenium	0.217	Discharge Permit Limits
Silver	1.67	Water Quality Standards
Zinc	7.32	Sludge Disposal

* The calculated MAIL for mercury is negative due to the domestic loading exceeding the MAHL. A uniform concentration local limit of 0.00004 mg/L will be set based upon maximum recorded background concentrations.

Section 4

Industrial Allocations

A POTW has several options available for applying limits to its controllable sources, including permitted industries. Limits can be applied as concentration-based limits (typically in mg/L) or mass-based limits (typically in lb/day), or both. The type of limit is in part dependent on the type of method used by the POTW to allocate the MAILs among the dischargers. There are several methods commonly used to allocate limits.

The uniform method of allocating MAILs is a commonly used method that yields one limit per pollutant that applies to all IUs regardless of size, permitted flow, or discharge. This method is not always preferred, since some IUs that do not discharge the pollutant may be given an allocation of the MAIL that they may not need whereas other IUs that do discharge that same pollutant may have to pretreat to comply with the uniform local limit.

Two additional methods of allocating MAILs among IUs are flow-based or mass-based limits. Flow-based limits are based on the permitted flows of each IU, whereas the mass-based limits are based on the proportion of the discharger's loadings to the total influent loadings at the WWTP.

Finally, a WWTP may set limits specific to each IU on a case-by-case basis. This type of allocation allows the WWTP personnel to use their knowledge of each IU discharge in conjunction with their own judgment in setting limits. This method can be used in conjunction with either flow-based or mass-based limits.

Section 5

Final Proposed Local Limits

Table 5-1 provides a summary of the existing local limits and calculated MAILs for the WWTP. Tolleson is requesting approval of the MAILs to allocate to industries on a site-specific, case-by-case basis in either mass- or concentration-based limits. The final proposed MAILs are as follows:

Table 5-1. Final Proposed Local Limits for City of Tolleson

Pollutant	Existing MAIL (lb/day)	Existing Local Limits (mg/L)	Recommended Local Limits as MAIL (lb/day)
Ammonia (as N)	---	30[1]	1,235
Biochemical Oxygen Demand (BOD), monthly average			27,407
Biochemical Oxygen Demand (BOD), daily maximum	---	500[2]	41,812
Suspended Solids, Total (TSS)	----	500[2]	22,181
Arsenic	0.412	0.04	1.08
Bis (2-ethylhexyl) phthalate	0.477	0.04	0.612
Boron	39.8	3.5	27.9
Cadmium	0.546	0.05	0.170
Chromium	10.3	0.92	10.4
Copper	5.35	0.48	4.31
Cyanide	0.723	0.06	0.185
Lead	3.73	0.33	0.712
Mercury	---[5]	0.0002	---[3]
Molybdenum	1.55	0.14	0.344
Nickel	NL	NL	5.66
Selenium	0.036	0.003	0.217
Silver	1.79	0.16	1.67
Zinc	22.0	1.9	7.32
Oil and Grease	---	100	---[4]
pH	---	6.0-10.5 S.U.	---[4]
Dissolved Sulfides	---	0.5	---[4]
Total Sulfides	---	10	---[4]

[1] Recommended alert level for monitoring

[2] Alert limit that will trigger evaluation of the total SIU load and impact on the treatment plant capacity

[3] The calculated MAIL for mercury is negative due to the domestic loading exceeding the MAHL. A uniform concentration local limit of 0.00004 mg/L will be set based upon maximum recorded background concentrations.

[4] The current local limit will be maintained

[5] Existing MAIL is negative due to the domestic loading exceeding the existing MAHL

Section 6

Limitations

This document was prepared solely for the City of Tolleson in accordance with professional standards at the time the services were performed and in accordance with the contract between City of Tolleson and Brown and Caldwell dated June 8, 2022. This document is governed by the specific scope of work authorized by City of Tolleson; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by City of Tolleson and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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Section 7

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Appendix A: Regulatory Limits and Criteria

Table A1. Influent Basis of Design for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Design Flow and Load Summary	
Design Parameter	Design Value
Flow, MGD	8.23
BOD concentration, mg/L	592
BOD load, ppd	40,650
TSS concentration, mg/L	432
TSS load, ppd	29,633
Ammonia concentration, mg/L	42
Ammonia load, ppd	2,889

Source: Brown and Caldwell, *Ammonia Removal Project Design Report*, Section 5.1, Design Flow and Loads, City of Tolleson, 2014, p. 5-1.

Table A2. AZPDES Permit Limits for City of Tolleson Wastewater Treatment Plant (WWTP)
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Limits (kg/day)			Concentration Limits (mg/L)			Minimum Measurement Frequency	Required Sample Type
	Monthly Average	Weekly Average	Daily Maximum	Monthly Average	Weekly Average	Daily Maximum		
Outfall 001: Salt River in the Middle Gila River Basin - Effluent Limits and Monitoring Requirements								
Discharge Flow (MGD)	Report	--	Report	--	--	--	Continuous	Metered
Biochemical oxygen demand (BOD5) (5-day)	2000	3000	--	30	45	--	1/week	24-Hr Composite
BOD[a]	--	--	--	85% Removal Minimum	--	--	1/week	24-Hr Composite
Total Suspended Solids (TSS)	2000	3000	--	30	45	--	1/week	24-Hr Composite
TSS[a]	--	--	--	85% Removal Minimum	--	--	1/week	24-Hr Composite
E Coli	--	--	--	126 cfu/100 mL	--	575 cfu/100 mL	4/month	Discrete
Chlorine, Total Residual (TRC)	0.600	--	1.20	0.009	--	0.018	5/week	Discrete
Ammonia	--	--	--	Calc.[b]	--	Calc.[b]	2/month	Discrete
Ammonia Impact Ratio	--	--	--	1	--	2	2/month	Discrete
Oil and Grease	660	--	990	10	--	15	1/month	Discrete
Boron	66.2	--	96.6	1.000	--	1.459	1/month	24-Hr Composite
Copper	1.260	--	2.450	0.019	--	0.037	1/month	24-Hr Composite
Cyanide	0.530	--	1.100	0.008	--	0.016	1/month	Discrete
Iron	54.200	--	108.6	0.819	--	1.640	1/month	24-Hr Composite
Mercury	0.0007	--	0.001	1.00E-05	--	2.00E-05	1/month	Discrete
Selenium	0.100	--	0.200	0.002	--	0.003	1/month	24-Hr Composite
Hardness	--	--	--	Report [mg/L]	--	Report [mg/L]	1/month	24-Hr Composite
Bis (2-ethylhexyl) phathalate	0.200	--	0.300	0.003	--	0.004	1/quarter	24-Hr Composite
Chlordane	0.00005	--	0.00008	0.0000008	--	0.000001	1/quarter	24-Hr Composite
Dieldrin	0.000003	--	0.000005	0.00000005	--	0.00000007	1/quarter	24-Hr Composite
p,p'-Dichloro diphenyl dichloroethane (DDD)	0.000010	--	0.00002	0.0000002	--	0.0000003	1/year	24-Hr Composite
p,p'-Dichloro diphenyl dichloroethylene (DDE)	0.000010	--	0.00002	0.0000002	--	0.0000003	1/year	24-Hr Composite
p,p'-Dichloro diphenyl trichloroethane (DDT)	0.000010		0.00002	0.0000002	--	0.0000003	1/year	24-Hr Composite
2,4,6 - Trichlorophenol	0.100	--	0.200	0.002	--	0.003	1/quarter	24-Hr Composite
p-Chloro-m-cresol	0.255	--	0.511	0.00385	--	0.00772	1/quarter	24-Hr Composite
Toxaphene	0.000010	--	0.000020	0.0000002	--	0.0000003	1/year	Discrete
Temperature	Report (°C)						2/month	Discrete
pH	Not Less than 6.5 standard units (S.U.) nor greater than 9.0 S.U.						5/week	Discrete
Whole Effluent Toxicity (WET)				See permit notes for limits				

Outfall 001: Salt River in the Middle Gila River Basin: Assessment Level Monitoring

	Assessment Levels		Monitoring Requirements	
Parameter	Monthly Average (ug/L)	Daily Maximum (ug/L)	Monitoring Frequency	Sample Type
Hydrogen Sulfide[c]	2	3	1/month	Discrete
Sulfides[c]	Report	Report	1/month	Discrete

Note(s):

[a] Influent and effluent shall be monitored.

[b] The ammonia limit is dependent on pH and temperature. The effluent must be tested for pH and temperature at the same time that the ammonia samples are taken. In addition to reporting the ammonia values on the DMRs, the ammonia data log shall also be completed including values of the effluent pH and temperature at the time the ammonia sample is taken. See Part II.B of the permit.

Table A3. AZPDES Aquifer Protection Permit No. P-100339 for City of Tolleson Wastewater Treatment Plant (WWTP)
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Sampling Point Number	Sampling Point Identification				
1	Minor Line Influent Meter Station				
2	95th Avenue Influent Meter Station				
Parameter	Limits			Monitoring Requirements	
	Alert Level	Discharge Limit	Units	Sampling Frequency	Reporting Frequency
Influent flow sampling point #1: Daily	Reserved	Reserved	mgd	Daily	Quarterly
Influent flow sampling point #1: Average Monthly	Reserved	Reserved	mgd	Monthly	Quarterly
Influent Flow Sampling point #2: Daily	Reserved	Reserved	mgd	Daily	Quarterly
Influent flow sampling point #2: Average Monthly	Reserved	Reserved	mgd	Monthly	Quarterly
Effluent Flow Sampling point #3: Daily	Reserved	Reserved	mgd	Daily	Quarterly
Effluent flow sampling point #3: Average Monthly	Reserved	Reserved	mgd	Monthly	Quarterly
Total Flow: Daily	Reserved	Reserved	mgd	Daily	Quarterly
Total Flow: Average Monthly	16.50	17.5	mgd	Monthly	Quarterly
Sampling Point Number	Sampling Point Identification				
3	Point of Discharge to the Palo Verde Nuclear Generating Station or AZPDES sampling location				
Parameter	Limits			Monitoring Requirements	
	Alert Level	Discharge Limit	Units	Sampling Frequency	Reporting Frequency
E. Coli	Monitor	504	CFU or MPN	Weekly	Quarterly
Metals (Total)					
Antimony	0.0048	0.006	mg/L	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/L	Quarterly	Quarterly
Barium	1.60	2.00	mg/L	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/L	Quarterly	Quarterly
Cadmium	0.004	0.005	mg/L	Quarterly	Quarterly
Chromium	0.08	0.1	mg/L	Quarterly	Quarterly
Cyanide, Free	0.16	0.2	mg/L	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/L	Quarterly	Quarterly
Lead	0.04	0.05	mg/L	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/L	Quarterly	Quarterly
Nickel	0.08	0.1	mg/L	Quarterly	Quarterly
Selenium	0.04	0.05	mg/L	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/L	Quarterly	Quarterly
Volatile and Semi-Volatile Organic Compounds (VOCs and SVOCs)					
Benzene	0.004	0.005	mg/L	Quarterly	Quarterly
Carbon Tetrachloride	0.004	0.005	mg/L	Quarterly	Quarterly
1,2-Dichlorobenzene	0.48	0.60	mg/L	Quarterly	Quarterly
1,4-Dichlorobenzene	0.06	0.075	mg/L	Quarterly	Quarterly
1,2-Dichloroethane	0.004	0.005	mg/L	Quarterly	Quarterly
1,1-Dichloroethylene	0.0056	0.007	mg/L	Quarterly	Quarterly
cis-1,2-Dichloroethylene	0.056	0.07	mg/L	Quarterly	Quarterly
trans-1,2-Dichloroethylene	0.08	0.1	mg/L	Quarterly	Quarterly
Dichloromethane	0.004	0.005	mg/L	Quarterly	Quarterly
1,2-Dichloropropane	0.004	0.005	mg/L	Quarterly	Quarterly
Ethylbenzene	0.56	0.7	mg/L	Quarterly	Quarterly
Monochlorobenzene	0.08	0.1	mg/L	Quarterly	Quarterly
Styrene	0.08	0.1	mg/L	Quarterly	Quarterly
Tetrachloroethylene (PCE)	0.004	0.005	mg/L	Quarterly	Quarterly
Toluene	0.8	1.0	mg/L	Quarterly	Quarterly
Total Trihalomethanes, total	0.08	0.1	mg/L	Quarterly	Quarterly
1,1,1-Trichlorethane	0.16	0.2	mg/L	Quarterly	Quarterly
1,2,4-Trichlorobenzene	0.056	0.07	mg/L	Quarterly	Quarterly
1,1,2-Trichloroethane	0.004	0.005	mg/L	Quarterly	Quarterly
Trichloroethene (TCE)	0.004	0.005	mg/L	Quarterly	Quarterly
Vinyl chloride	0.0016	0.002	mg/L	Quarterly	Quarterly
Xylenes, total	8.0	10.0	mg/L	Quarterly	Quarterly
Indicator Paramaters					
pH (field)	Monitor	Monitor	S.U.	Quarterly	Quarterly
Iron	Monitor	Monitor	mg/L	Quarterly	Quarterly
Manganese	Monitor	Monitor	mg/L	Quarterly	Quarterly
Total Organic Carbon	Monitor	Monitor	mg/L	Quarterly	Quarterly
Total Dissolved Solids	Monitor	Monitor	mg/L	Quarterly	Quarterly
Sodium	Monitor	Monitor	mg/L	Quarterly	Quarterly
Potassium	Monitor	Monitor	mg/L	Quarterly	Quarterly

Calcium	Monitor	Monitor	mg/L	Quarterly	Quarterly
Magnesium	Monitor	Monitor	mg/L	Quarterly	Quarterly
Chloride	Monitor	Monitor	mg/L	Quarterly	Quarterly
Sulfate	Monitor	Monitor	mg/L	Quarterly	Quarterly
Alkalinity	Monitor	Monitor	mg/L	Quarterly	Quarterly
Specific Conductivity (field)	Monitor	Monitor	umhos/cm	Quarterly	Quarterly
Sampling Point Number	Sampling Point Identification				
4	The hose bibs transporting the effluent at onsite reuse location				
Parameter	Limits			Monitoring Requirements	
	Discharge Limit		Units	Sampling Frequency	Reporting Frequency
E. Coli	504		CFU or MPN	Daily	Quarterly
E. Coli: Four (4) of last seven (7) samples	126		CFU or MPN	Daily	Quarterly
Sampling Point Number	Sampling Point Identification				
5	POC Well #1				
Parameter	Limits			Monitoring Requirements	
	Alert Level	Aquifer Quality Limit	Units	Sampling Frequency	Reporting Frequency
Total Nitrogen	18.3	20.3	mg/L	Monthly	Quarterly
Nitrate-Nitrite as N	17.8	19.8	mg/L	Monthly	Quarterly
Total Kjeldahl Nitrogen (TKN)	Monitor	Monitor	mg/L	Monthly	Quarterly
Total Coliform	Absence	Absence	CFU or MPN	Monthly	Quarterly
Metals (Total)					
Antimony	0.0048	0.006	mg/L	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/L	Quarterly	Quarterly
Asbestos (million fibers per liter)	5.6	7.0	mf/L		
Barium	1.60	2.00	mg/L	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/L	Quarterly	Quarterly
Cadmium	0.004	0.005	mg/L	Quarterly	Quarterly
Chromium	0.08	0.1	mg/L	Quarterly	Quarterly
Cyanide, Free	0.16	0.2	mg/L	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/L	Quarterly	Quarterly
Lead	0.04	0.05	mg/L	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/L	Quarterly	Quarterly
Nickel	0.08	0.1	mg/L	Quarterly	Quarterly
Selenium	0.04	0.05	mg/L	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/L	Quarterly	Quarterly
Volatile and Semi-Volatile Organic Compounds (VOCs and SVOCs)					
Benzene	0.004	0.005	mg/L	Quarterly	Quarterly
Carbon Tetrachloride	0.004	0.005	mg/L	Quarterly	Quarterly
1,2-Dichlorobenzene	0.48	0.6	mg/L	Quarterly	Quarterly
1,4-Dichlorobenzene	0.06	0.075	mg/L	Quarterly	Quarterly
1,2-Dichloroethane	0.004	0.005	mg/L	Quarterly	Quarterly
1,1-Dichloroethylene	0.0056	0.007	mg/L	Quarterly	Quarterly
cis-1,2-Dichloroethylene	0.056	0.07	mg/L	Quarterly	Quarterly
trans-1,2-Dichloroethylene	0.08	0.1	mg/L	Quarterly	Quarterly
Dichloromethane	0.004	0.005	mg/L	Quarterly	Quarterly
1,2-Dichloropropane	0.004	0.005	mg/L	Quarterly	Quarterly
Ethylbenzene	0.56	0.7	mg/L	Quarterly	Quarterly
Hexachlorobenzene	0.0008	0.001	mg/L	Quarterly	Quarterly
Hexachlorocyclopentadiene	0.04	0.05	mg/L	Quarterly	Quarterly
Monochlorobenzene	0.08	0.1	mg/L	Quarterly	Quarterly
Styrene	0.08	0.1	mg/L	Quarterly	Quarterly
2, 3, 4-8-TCDD (Dioxin)	0.000000024	0.00000003	mg/L	Quarterly	Quarterly
Tetrachloroethylene (PCE)	0.004	0.005	mg/L	Quarterly	Quarterly
Toluene	0.8	1.0	mg/L	Quarterly	Quarterly
Total Trihalomethanes, total	0.08	0.1	mg/L	Quarterly	Quarterly
1,1,1-Trichlorethane	0.16	0.2	mg/L	Quarterly	Quarterly
1,2,4-Trichlorobenzene	0.056	0.07	mg/L	Quarterly	Quarterly
1,1,2-Trichloroethane	0.004	0.005	mg/L	Quarterly	Quarterly
Trichloroethene (TCE)	0.004	0.005	mg/L	Quarterly	Quarterly
Vinyl chloride	0.0016	0.002	mg/L	Quarterly	Quarterly
Xylenes, total	8.0	10.0	mg/L	Quarterly	Quarterly
Indicator Paramaters					
pH (field)	Monitor	Monitor	S.U.	Annually	Annually
Iron	Monitor	Monitor	mg/L	Annually	Annually
Manganese	Monitor	Monitor	mg/L	Annually	Annually
Total Organic Carbon	Monitor	Monitor	mg/L	Annually	Annually
Total Dissolved Solids	Monitor	Monitor	mg/L	Annually	Annually

Sodium	Monitor	Monitor	mg/L	Annually	Annually
Potassium	Monitor	Monitor	mg/L	Annually	Annually
Calcium	Monitor	Monitor	mg/L	Annually	Annually
Magnesium	Monitor	Monitor	mg/L	Annually	Annually
Chloride	Monitor	Monitor	mg/L	Annually	Annually
Sulfate	Monitor	Monitor	mg/L	Annually	Annually
Alkalinity	Monitor	Monitor	mg/L	Annually	Annually
Specific Conductivity (field)	Monitor	Monitor	umhos/cm	Annually	Annually

Source(s):

Arizona Department of Environmental Quality (ADEQ) Permit No. P-100339 Pages 17-24, Tables IA-II

Table A4. Biosolids Regulatory Limits for City of Tolleson Wastewater Treatment Plant (WWTP)
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Toxicity Characteristic Leaching Procedure Test			
Pollutant	TCLP Limit mg/L	20 X TCLP Screening Value mg/kg	Minimal Monitoring Frequency per Generator
Metals/Nonmetal Inorganics			
Arsenic	5	100	1/year
Barium	100	2000	1/year
Cadmium	1	20	1/year
Chromium	5	100	1/year
Lead	5	100	1/year
Mercury	0.2	4	1/year
Selenium	1	20	1/year
Silver	5	100	1/year
Volatiles and Semi-Volatiles			
Benzene	0.5	10	1/year
Carbon tetrachloride	0.5	10	1/year
Chlorobenzene	100	2000	1/year
Chloroform	6	120	1/year
1,2-Dichloroethane	0.5	10	1/year
1,1-Dichloroethene	0.7	14	1/year
2-Butanone (MEK)	200	4000	1/year
Tetrachloroethene (PCE)	0.7	14	1/year
Trichloroethene (TCE)	0.5	10	1/year
Vinyl chloride	0.2	4	1/year
1,4-Dichlorobenzene	7.5	150	1/year
2-Methylphenol (o-cresol) [a]	200	4000	1/year
m-cresol [a]	200	4000	1/year
p-cresol [a]	200	4000	1/year
Cresol, total [a]	200	4000	1/year
2,4-Dinitrotoluene	0.13	2.6	1/year
Hexachlorobenzene	0.13	2.6	1/year
Hexachlorobutadiene	0.5	10	1/year
Hexachloroethane	3	60	1/year
Nitrobenzene	2	40	1/year
Pentachlorophenol	100	2000	1/year
Pyridine	5	100	1/year
2,4,5-Trichlorophenol	400	8000	1/year
2,4,6-Trichlorophenol	2	40	1/year
Herbicides/Pesticides			
2,4-D	10	200	1/year
Silvex (2,4,5-TP)	1	20	1/year
Chlordane (technical)	0.03	0.6	1/year
Endrin	0.02	0.4	1/year
Heptachlor	0.008	0.16	1/year
Heptachlor epoxide	0.008	0.16	1/year
BHC, gamma (Lindane)	0.44	8.8	1/year
Methoxychlor	10	200	1/year
Toxaphene	0.5	10	1/year

Metal Concentrations for Land Applications			
Pollutant	Ceiling Concentrations (mg/kg)	Monthly Average Pollutant Concentrations (mg/kg)	Minimum Monitoring Frequency per volume
Arsenic	75.0	41.0	1/quarter
Cadmium	85.0	39.0	1/quarter
Chromium	3000.0	N/A	1/quarter
Copper	4300.0	1500.0	1/quarter
Lead	840.0	300.0	1/quarter
Mercury	57.0	17.0	1/quarter
Molybdenum	75.0	N/A	1/quarter
Nickel	420.0	420.0	1/quarter
Selenium	100.0	100.0	1/quarter
Zinc	7500.0	2800.0	1/quarter

[a]If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/L.

Source: Arizona Department of Environmental Quality (ADEQ) Permit No. AZ0020338, Pages 21-23, Tables 8&9

Table A5. Summary of Water Quality Standards for City of City of Tolleson Wastewater Treatment Plant (WWTP)
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	Numeric Water Quality Standards (WQS)[a, b]						Most Stringent WQS - ug/L
	Acute Aquatic and Wildlife effluent dependent water (A&Wedw) - ug/L	Chronic Aquatic and Wildlife effluent dependent water (A&Wedw) - ug/L	Partial Body Contact (PBC) - ug/L	Fish Consumption (FC) - ug/L	Agricultural Irrigation (AgI) - ug/L	Agricultural Livestock Watering (AgL) - ug/L	
Ammonia (as N) (mg/L) [a]	7513.3	2226.9	-	-	-	-	2226.9
Biochemical Oxygen Demand (BOD)	-	-	-	-	-	-	-
Suspended Solids, Total (TSS)	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	160	25	130	2	-	-	2
Antimony	1,000 D	600 D	747 T	640 T	-	-	600
Arsenic	340 D	150 D	280 T	80 T	2,000 T	200 T	80
Barium	-	-	98,000 T	-	-	-	98000
Beryllium	65 D	5.3 D	1,867 T	84 T	-	-	5.3
Bis (2-ethylhexyl) phthalate	400	360	18667	3	-	-	3
Boron	-	-	186,667 T	-	1,000 T	-	1000
Cadmium	25.9	1.6	700 T	84 T	50	50	1.6
Chromium	-	-	-	-	1000	1000	1000
cis-1,2-Dichloroethylene	-	-	70	-	-	-	70
Copper	37.3	22.6	1,300 T	-	5,000 T	500 T	22.6
Cyanide	41 T	9.7 T	18,667 T	16,000 T	-	200 T	9.7
Fluoride	-	-	140000	-	-	-	140000
Iron	-	1,000 D	-	-	-	-	1000
Lead	205.7	8.0	15 T	-	10,000T	100 T	8.0
Mercury	2.4 D	0.01 D	280 T	-	-	10 T	0.01
Molybdenum	-	-	-	-	-	-	-
Nickel	1172.7	130.2	28,000 T	511 T	-	-	130.2
Oil and Grease	-	-	-	-	-	-	-
p-Chloro-m-cresol	15	4.7	-	-	-	-	4.7
Selenium	-	2 T	4,667 T	667 T	20 T	50 T	2
Silver	20.8	-	4,667 T	8,000 T	-	-	20.8
Styrene	5600	370	186,667	-	-	-	370
Thallium	700 D	150 D	75 T	7.2 T	-	-	7.2
Xylenes (total)	-	-	186,667	-	-	-	186667
Zinc	293.9	293.9	280,000 T	5,106 T	10,000T	25,000T	293.9

[a]Acute and chronic A&Wedw WQS for ammonia were calculated using the equations from Table 15 and 16 in AAC 18.11 using daily temperature and pH values from October 2022-September 2023. The minimum calculated WQS were used.

[b]Acute and chronic A&Wedw for hardness-dependent parameters were calculated using the equations in Tables 2-9 in AAC 18.11. An average hardness value of 296 mg/L was used to be consistent with AZPDES permit AZ0020338 fact sheet.

Source: Arizona Department of Environmental Quality, *Arizona Administrative Code, Title 18, Chapter 11 - Water Quality Standards*

Appendix B: Literature Data

Table B1. Primary Treatment Removal Efficiencies[a] - Literature Values Industrial Pretreatment Program: Local Limits Evaluation City of Tolleson, Arizona		
Pollutant	Median (%)	No. of POTWs with Removal Data[b]
Metal/Nonmetal Inorganics		
Cadmium	15	6 of 40
Chromium	27	12 of 40
Copper	22	12 of 40
Cyanide	27	12 of 40
Lead	57	1 of 40
Mercury	10	8 of 40
Nickel	14	9 of 40
Silver	20	4 of 40
Zinc	27	12 of 40
Organics		
1,1,1-Trichloroethane	40	10 of 40
trans-1,2-Dichloroethene	36	9 of 40
Benzene	25	8 of 40
Benzyl butyl phthalate	62	4 of 40
Chloroform	14	11 of 40
Diethyl phthalate	56	1 of 40
dl-n-Butyl phthalate	36	3 of 40
Ethylbenzene	13	12 of 40
Naphthalene	44	4 of 40
Phenol	8	11 of 40
Tetrachloroethene (PCE)	4	12 of 40
Trichloroethene (TCE)	20	12 of 40

[a] Pollutant removals between POTW influent and primary effluent. From *Fate of Priority Pollutants in Publicly Owned Treatment Works,* Volume I (EPA 440/1-82/303), USEPA, Washington, DC, September 1982, page 61.

[b] Median removal efficiencies from a database of removal efficiencies for 40 POTWs. Only POTWs with average influent concentrations exceeding three times each pollutant's detection limit were considered.

USEPA. *EPA Guidance Manual - Local Discharge Limitations Under the Pretreatment Program,* Page 3-55, Table 3-9.

USEPA. *EPA Guidance Manual - Local Limits Development Guidance* , Appendix R. Page R-1. July 2004.

Table B2. Removal Efficiencies Through Tricking Filter Treatment[a] - Literature Values
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, Arizona

Pollutant	Range (%)	Second Decile (%)	Median (%)	Eighth Decile (%)	No. of POTWs with Removal Data
Metal/Nonmetal Inorganics[b]					
Cadmium	33-96	33	68	93	6 of 11
Chromium	5-92	34	55	71	9 of 11
Copper	12-97	32	61	89	9 of 11
Cyanide	7-88	33	59	79	8 of 11
Lead	4-84	25	55	70	6 of 11
Mercury	14-80	33	50	62	9 of 11
Nickel	7-72	11	29	57	9 of 11
Silver	11-93	38	66	86	8 of 11
Zinc	14-90	34	67	81	9 of 11
Organics[b]					
Benzene	5-98	50	75	93	7 of 11
Chloroform	21-94	50	73	84	9 of 11
1,2-trans-Dichloroethylene	14-99	50	50	96	7 of 11
Ethylbenzene	45-97	50	80	91	10 of 11
Methylene chloride	5-98	28	70	85	10 of 11
Naphthalene	33-93	40	71	87	6 of 11
Phenol	50-99	75	84	96	8 of 11
Bis (2-ethylhexyl) phthalate	4-98	21	58	81	10 of 11
Butyl benzyl phthalate	25-90	37	60	77	9 of 11
Di-n-butyl phthalate	29-97	41	60	82	10 of 11
Diethyl phthalate	17-75	40	57	67	8 of 11
Tetrachloroethylene	26-99	53	80	93	10 of 11
Toluene	17-99	80	93	97	10 of 11
1,1,1-Trichloroethane	23-99	75	89	97	10 of 11
Trichloroethylene	50-99	67	94	98	10 of 11

[a] Pollutant removals between POTW influent and secondary effluent (including secondary clarification). Based on a computer analysis of POTW removal efficiency data, (derived from actual POTW influent and effluent sampling data) provided in the *Fate of Priority Pollutants in Publicly Owned Treatment Works,* Volume II (EPA 440/1-82/303), USEPA, Washington, DC, September 1982.

[b] For the purpose of deriving removal efficiencies, effluent levels reported as below the detection were set equal to the reported detection limits. All secondary trickling filter plants sampled as part of the study were considered.

USEPA. *EPA Guidance Manual - Local Limits Development Guidance* , Appendix R. Page R-3. July 2004.

Table B3. Trickling Filter Inhibition Threshold Levels - Literature Values Industrial Pretreatment Program: Local Limits Evaluation City of Tolleson, Arizona		
Pollutant	Reported Range of Trickling Filter Inhibition Threshold Level (mg/L)	Median of Range used for Calculation
Chromium (III)	3.5 - 67.6	35.55
Cyanide	30	30

USEPA. *EPA Guidance Manual - Local Limits Development Guidance* , Appendix G. Page G-2. July 2004.

Table B4. Nitrification Inhibition Threshold Levels[a] - Literature Values Industrial Pretreatment Program: Local Limits Evaluation City of Tolleson, Arizona				
Pollutant	Minimum Reported Inhibition Threshold (mg/L)	Reported Range of Inhibition Threshold Level (mg/L)	Laboratory, Pilot, or Full-Scale	Median of Range used for Calculation
Metal/Nonmetal Inorganics				
Arsenic	--	1.5	Unknown	1.5
Cadmium	5.2	5.2	Lab	5.2
Chloride	--	180	Unknown	180
Chromium, Hexavalent	1	1-10	As CrO_4^{2-}; Unknown	5.5
Chromium	0.25 --	0.25-1.9 1-100 (trickling filter)	Unknown[b] Unknown	50.5
Copper	0.05	0.05-0.48	Unknown	0.265
Cyanide	0.34	0.34-0.5	Unknown	0.42
Lead	0.5	0.5	Unknown	0.5
Nickel	0.25 --	0.25-0.5 5	Unknown[b] Pilot	0.375
Zinc	0.08	0.08-0.5	Unknown	0.29
Organics				
Chloroform	10	10	Unknown	10
2,4-Dichlorophenol	64	64	Unknown	64
2,4-Dinitrophenol	150	150	Unknown	150
Phenol	4 --	4 4-10	Unknown[b] Unknown	7

[a] References/sources did not distinguish between total or dissolved pollutant levels.

[b] Multiple rows per pollutant indicate values from multiple references/sources values.

USEPA *EPA Guidance Manual - Local Discharge Limitations Under the Pretreatment Program* , Page 3-47, Table 3-4.

USEPA. *EPA Guidance Manual - Local Limits Development Guidance* , Appendix G. Page G-2. July 2004.

Table B5. Anaerobic Digestion Inhibition Threshold Levels[a] - Literature Values Industrial Pretreatment Program: Local Limits Evaluation City of Tolleson, Arizona		
Pollutant	Reported Range of Anaerobic Digestion Inhibition Threshold Levels, mg/L	Median of Range used for Calculation
Metal/Nonmetal Inorganics		
Ammonia (as N)	1500 - 8000	4750
Arsenic	1.6	1.6
Cadmium	20	20.0
Chromium (III)	130	130.0
Chromium (VI)	110	110.0
Copper	40	40.0
Cyanide	4 - 100 1 - 4	50.5
Lead	340	340
Nickel	10 136	73
Silver	13 - 65[b]	39
Sulfate	500 - 1000	750
Sulfide	50 - 100	75
Zinc	400	400
Organics		
Acrylonitrile	5 5	5
Carbon Tetrachloride	2.9 - 159.4 10 - 20 2.0	80.7
Chlorobenzene	0.96 - 3 0.96	1.98
Chloroform	1 5 - 16 10 - 16	8.5
1,2-Dichlorobenzene	0.23 - 3.8 0.23	2.015
1,4-Dichlorobenzene	1.4 - 5.3 1.4	3.35
Methyl chloride	3.3 - 536.4 100	269.85
Pentachlorophenol	0.2 0.2 - 1.8	1
Tetrachloroethylene	20	20
Trichloroethylene	1 - 20 20 20	10.5
Trichlorofluoromethane	-	-

[a]Total pollutant inhibition levels, unless otherwise indicated.

[b]Dissolved metal inhibition levels.

USEPA. *EPA Guidance Manual - Local Limits Development Guidance* , Appendix G. Page G-2. July 2004.

Table B6. Domestic/Commercial Pollutant Loading - Literature Values
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, Arizona

Pollutant	USEPA Literature Values[a]				
	Number of Detections	Number of Samples	Minimum Concentration (mg/L)	Maximum Concentration (mg/L)	Average Concentration (mg/L)
Metal/Nonmetal Inorganics					
Arsenic	140	205	0.0004	0.088	0.007
Barium	3	3	0.04	0.216	0.115
Boron	4	4	0.1	0.42	0.3
Cadmium	361	538	0.00076	0.11	0.008
Chromium, Trivalent	1	2	<0.005	0.007	0.006
Chromium, Hexavalent	-	-	-	-	-
Chromium	311	522	<0.001	1.2	0.034
Copper	603	607	0.005	0.74	0.14
Cyanide	7	7	0.01	0.37	0.082
Fluoride	2	2	0.24	0.27	0.255
Iron	18	18	0.0002	3.4	0.989
Lead	433	540	0.001	2.04	0.058
Lithium	2	2	0.03	0.031	0.031
Manganese	3	3	0.04	0.161	0.087
Mercury	218	235	<0.0001	0.054	0.002
Molybdenum	-	-	-	-	-
Nickel	313	540	<0.001	1.6	0.047
Total Phosphate as P	2	2	27.4	30.2	28.8
Phosphorus, Total	1	1	0.7	0.7	0.7
Silver	181	224	0.0007	1.052	0.019
Zinc	636	638	0.01	1.28	0.231
Organics					
Chloroform	21	30	<0.002	0.069	0.009
1,1-Dichloroethene	2	29	0.005	0.008	0.007
1,1-Dichloroethane	1	28	0.026	0.026	0.026
Trans-1,2-Dichloroethene	1	28	0.013	0.013	0.013
Fluoranthene	2	5	0.00001	<0.001	0.001
Methylene Chloride	7	30	0.00008	0.055	0.027
Phenols	2	2	0.00002	0.00003	0.000025
Bis(2-ethylhexyl)Phthalate	5	5	0.00002	0.022	0.006
Pyrene	2	3	0.00001	<0.005	0.0002
Tetrachloroethene (PCE)	5	29	0.00001	0.037	0.014
Toluene	-	-	-	-	-
1,2,4-Trichlorobenzene	1	3	<0.002	0.035	0.013
Pesticides					
BHC	3	3	0.001	0.001	0.001
4,4-DDD	3	3	0.00026	0.0004	0.0003
Endosulfan	3	3	0.002	0.002	0.002

[a] Pollutant levels reported below specified detection limit were considered in the data analysis and, for the purpose of statistical analysis, were considered equal to the detection limit.
USEPA. *EPA Guidance Manual - Local Limits Development Guidance* , Appendix V. Page V-1. July 2004.

USEPA. *EPA Supplemental Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Programs,* Page I-9. Table 2. May 1991

Table B7. Screening Levels for WRP Worker Protection
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, Arizona

Pollutant	Discharge Screening Levels[a]		Secondary Discharge Screening Levels		Most Stringent Screening Level for Worker Protection (mg/L)
	Based on Fume Toxicity (mg/L)	Based on Explosivity (mg/L)	Gas/Vapor Toxicity Screening Level[b] (mg/L)	Explosivity Screening Level[c] (mg/L)	
Acrolein	0.047	13,163	-----	-----	0.047
Acrylonitrile	4.822	14,586	1.19	1794	1.19
Aldrin	-----	-----	0.38	-----	0.38
Aroclor 1242	-----	-----	0.01	-----	0.01
Aroclor 1254	-----	-----	0.005	-----	0.005
Benzene	0.014	169	0.13	20	0.014
Bis(2-chloromethyl)Ether	-----	-----	0.0005	-----	0.0005
Bromoform	0.227	-----	0.24	-----	0.227
Carbon Disulfide	-----	-----	0.06	6.3	0.06
Carbon Tetrachloride	0.011	-----	0.03	-----	0.011
Chlordane	-----	-----	1.27	-----	1.27
Chlorobenzene	2.290	395	2.31	40	2.290
Chloroethane	5.880	222	5.73	1.6	1.6
Chloroform	0.060	-----	0.41	-----	0.060
1,2-Dichlorobenzene	-----	-----	3.75	165	3.750
1,4-Dichlorobenzene	-----	-----	3.55	104	3.55
Dichlorodifluoromethane	-----	-----	0.04	-----	0.04
1,1-Dichloroethane	1.685	909	4.58	128	1.685
1,2-Dichloroethane	0.168	5,221	1.05	660	0.17
1,1-Dichloroethene	0.016	215	0.003	3.3	0.003
trans-1,2-Dichloroethene	2.040	571	0.28	14	0.28
1,2-Dichloropropane	4.289	1,326	3.62	164	3.62
1,3-Dichloropropene, total	-----	-----	0.08	435	0.08
Dieldrin	-----	-----	13	-----	13
Diethyl phthalate	-----	-----	107	-----	107
4,6-Dinitro-2-methylphenol	-----	-----	10.78	-----	10.78
2,4-Dinitrotoluene	-----	-----	7.21	-----	7.21
Endrin	-----	-----	4.9	-----	4.9
Ethylbenzene	1.659	106	1.59	16	1.59
Formaldehyde	-----	-----	0.06	412	0.06
Heptachlor	-----	-----	0.003	-----	0.003
Hexachlorobutadiene	-----	-----	0.0002	-----	0.0002
Hexachlorocyclopentadiene	-----	-----	658	-----	658
Hexachloroethane	-----	-----	0.093	-----	0.093
Hydrogen Cyanide	1.149	13,529	-----	-----	1.149
Un-ionized Hydrogen Sulfide	0.034	96	-----	-----	0.034
Bromomethane	0.305	1,521	0.002	4.7	0.002
Chloromethane	0.557	450	0.29	1.1	0.29
2-Butanone (MEK)	-----	-----	249	2486	249
Methylene chloride	4.139	4,307	2.06	494	2.06
Napthalene	-----	-----	2.65	240	2.65
Nitrobenzene	-----	-----	9.41	17046	9.41
Pentachlorophenol	-----	-----	4.37	-----	4.37
Phenol	-----	-----	1,024	-----	1024
1,1,2,2-Tetrachloroethane	1.847	-----	0.44	-----	0.44
Tetrachloroethene (PCE)	-----	-----	0.53	-----	0.53
Toluene	2.075	152	1.36	17	1.36
Toxaphene	-----	-----	0.003	-----	0.003
1,2,4-Trichlorobenzene	-----	-----	0.39	197	0.39
1,1,1-Trichloroethane	2.759	591	1.55	33	1.55
1,1,2-Trichloroethane	1.601	9,611	1.15	-----	1.15
Trichloroethene (TCE)	0.026	1,029	0.71	114	0.026
Trichlorofluoromethane	-----	-----	1.23	-----	1.23
Vinyl Chloride	0.012	88	0.004	2.2	0.004

[a] USEPA. *EPA Guidance Manual - Local Limits Development Guidance*, Appendix I. Page I-1. July 2004.

[b] Gas/Vapor Toxicity Screening Levels from Tables 4-2 and/or B-1 of USEPA's *Guidance to Protect POTW Workers from Toxic and Reactive Gases and Vapors* (EPA 812-B-92-001), June 1992.

[c] Explosivity Screening Levels from Table 4-2 of USEPA's *Guidance to Protect POTW Workers from Toxic and Reactive Gases and Vapors* (EPA 812-B-92-001), June 1992.

----- indicates no value reported

Appendix C: Ammonia WQS Calculations and BOD Loading Analysis

Table C1. Ammonia Water Quality Standard Calculations
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, AZ

Month	pH	Temperature (degrees Celsius)	Acute Ammonia WQS - Calculated (mg/l)	Chronic Ammonia WQS - Calculated (mg/l)
Oct-22	7.16	24.4	26.76047212	4.978569437
Oct-22	7.28	24.5	23.10276285	4.621003602
Oct-22	7.33	23.1	24.35631287	4.895196272
Oct-22	7.46	21.6	22.00685312	4.890891732
Oct-22	7.78	21.1	13.11683354	3.648396359
Oct-22	7.2	22.2	30.72636182	5.617108679
Oct-22	7.33	22	26.31411291	5.254968408
Oct-22	7.29	23.4	24.99672914	4.929395586
Oct-22	7.21	24.6	24.8986331	4.785350441
Oct-22	7.28	21.9	28.03116255	5.464322298
Oct-22	7.31	22.7	25.83192182	5.090650838
Oct-22	7.35	24.6	20.95315485	4.383095294
Oct-22			60.91184485	
Oct-22	7.22	23.4	27.18841761	5.14130404
Oct-22	7.06	24.4	29.61721112	5.216952741
Oct-22	7.3	24.7	22.16396163	4.5040805
Oct-22	7.17	23.5	28.52214026	5.248876904
Oct-22	7.12	21.2	33.58601008	6.241248781
Oct-22	7.03	22.1	36.64883434	6.126611551
Oct-22	7.08	24.5	28.81228333	5.138590334
Oct-22	7.32	24.7	21.60784048	4.445235408
Oct-22	7.02	22.4	36.27609112	6.033303249
Oct-22	7.15	23.8	28.42820657	5.201201702
Oct-22	7.06	20.9	35.63865871	6.537578287
Oct-22	7.23	22.8	28.24466795	5.313626086
Oct-22	7.19	22.8	29.56587919	5.433391312
Oct-22	7.13	21.3	33.24071168	6.171442449
Oct-22	7.11	23.1	31.40607173	5.547779004
Oct-22	7.02	23.3	33.66824541	5.69318314
Oct-22	7.03	23	34.20447874	5.781231301
Oct-22	6.9	22.5	39.73176582	6.254329526
Nov-22	7.81		12.43812858	
Nov-22	7	23.2	34.55681728	5.774682475
Nov-22	7.03	26.4	25.80375896	4.643231589
Nov-22	6.97	21.8	38.62604988	6.390766258
Nov-22	6.92	20.6	40.22050125	7.024244272
Nov-22	7.1	21.4	34.2742215	6.21913718
Nov-22	7.03	21.4	36.64883434	6.409443823
Nov-22	7.08	22.6	33.72699722	5.80823254
Nov-22	6.99	22.7	36.33373033	5.986420191
Nov-22	7.02	21.8	36.98261988	6.271265026
Nov-22	7.09	23.3	31.51459408	5.527196752
Nov-22	7.05	21.4	35.976774	6.356992443
Nov-22	7.1	22.6	33.06666606	5.756123939
Nov-22	7.07	22.1	35.29926205	6.024872057
Nov-22	0	0	60.91184485	
Nov-22	7.12	20	33.58601008	6.743284675

Nov-22	7.06	22.1	35.63865871	6.050857184
Nov-22	7.25	23.2	26.68542954	5.117985881
Nov-22	7	20.6	37.6453142	6.828543955
Nov-22	7.09	23.8	30.23512146	5.351862222
Nov-22	7.06	23.5	31.91127533	5.528622063
Nov-22	7.07	22.6	34.0555922	5.833750199
Nov-22	7.1	21.5	34.2742215	6.179169898
Nov-22	7.25	21.4	29.07042542	5.747766059
Nov-22	7.03	20.4	36.64883434	6.836287921
Nov-22	6.56	20.6	49.72284443	7.635731046
Nov-22	6.81	20.5	43.51887608	7.301553988
Nov-22	6.92	20.7	40.22050125	6.979102971
Nov-22	7.09	22.7	33.12163123	5.745196993
Nov-22	7.22	22	30.11349213	5.626952996
Dec-22	7.04	20.7	36.31352603	6.678096401
Dec-22	7.35	22.3	25.35417144	5.083711693
Dec-22	7.41	20.1	23.62978258	5.606190055
Dec-22	7.07	22.3	34.91310196	5.94768321
Dec-22	7.11	21.7	33.93054284	6.071823694
Dec-22	7.27	21.3	28.37700922	5.715239957
Dec-22	7.29	21.7	27.68601016	5.500392381
Dec-22	7.25	21.8	29.07042542	5.601432198
Dec-22	7.33	20	26.31411291	5.978195447
Dec-22	7.06	19.4	35.63865871	7.201399472
Dec-22	6.94	20.8	39.58913092	6.888226049
Dec-22	7.19	20.4	31.15788626	6.342653463
Dec-22	7.29	19.6	27.68601016	6.297869712
Dec-22	7.24	19.5	29.41781345	6.535313187
Dec-22	7.22	19.7	30.11349213	6.52639398
Dec-22	7.16	21.2	32.20111877	6.119339786
Dec-22	7.12	19.3	33.58601008	7.054585384
Dec-22	7.06	18.6	35.63865871	7.582578281
Dec-22	7.05	20.7	35.976774	6.650460145
Dec-22	7.15	18.1	32.54817574	7.511102628
Dec-22	7.09	20.1	34.61695848	6.793677464
Dec-22	7.02	21	36.98261988	6.603210689
Dec-22	7.25	19.7	29.07042542	6.413558841
Dec-22	7.24	22.7	28.14707044	5.316996871
Dec-22	6.93	23	37.24433316	5.997463382
Dec-22	6.94	20.1	39.58913092	7.206217912
Dec-22	7.06	21.6	35.63865871	6.249091771
Dec-22	6.89	19.9	41.1503263	7.418751074
Dec-22	7	22	37.6453142	6.239188535
Dec-22	6.91	19.7	40.53279752	7.467991971
Jan-23	7.04	21.5	36.31352603	6.342386207
Jan-23	7.13	20.4	33.24071168	6.540134553
Jan-23	7.06	19.1	35.63865871	7.342042642
Jan-23	7.19	20	31.15788626	6.508351259
Jan-23	6.9	20.8	40.84275758	6.978800114
Jan-23	6.85	19.5	42.35565957	7.703194981
Jan-23	6.67	18.5	47.22734194	8.575808404
Jan-23	7.14	18.5	32.8947369	7.356381485

Jan-23	6.86	17.3	42.05816498	8.851645587
Jan-23	6.99	20.2	37.97407276	7.033430445
Jan-23	7.09	21.1	34.61695848	6.369493877
Jan-23	7	19.4	37.6453142	7.377820916
Jan-23	6.95	21.3	39.27017738	6.646890301
Jan-23	7.08	21.2	34.95866718	6.356879742
Jan-23	7.05	21.2	35.976774	6.439493293
Jan-23	7.06	19.3	35.63865871	7.247978603
Jan-23	7.11	22.7	32.46486627	5.692711208
Jan-23	7.04	18.9	36.31352603	7.499851841
Jan-23	7.07	19.9	35.29926205	6.943010607
Jan-23	7.2	18.5	30.80976103	7.130382483
Jan-23	7.19	19.4	31.15788626	6.765049582
Jan-23	6.91	16.5	40.53279752	9.179179072
Jan-23	6.95	18.5	39.27017738	7.961932866
Jan-23	7.07	15.2	35.29926205	9.400432358
Jan-23	6.94	16.1	39.58913092	9.326257254
Jan-23	6.82	16.2	43.23216642	9.608704391
Jan-23	6.85	16.9	42.35565957	9.109003957
Jan-23	6.83	17.3	42.94270147	8.926698821
Jan-23	6.96	18.4	38.94912863	7.985470535
Jan-23	6.89	19.2	41.1503263	7.761234387
Jan-23	6.95	19.2	39.27017738	7.610593245
Feb-23	6.99	19.4	37.97407276	7.405718449
Feb-23	7.02	20.4	36.98261988	6.863650399
Feb-23	6.84	20.6	42.65051915	7.196031235
Feb-23	6.71	20.4	46.22762242	7.525155041
Feb-23	7.14	21.4	32.8947369	6.101888151
Feb-23	7.39	21.1	24.29180347	5.336205816
Feb-23	7.13	20.4	33.24071168	6.540134553
Feb-23	7.12	21.5	33.58601008	6.121692269
Feb-23	7.05	21.7	35.976774	6.235218761
Feb-23	6.96	22	38.94912863	6.331411075
Feb-23	7.04	20.8	36.31352603	6.635179619
Feb-23	7.1	23	31.98824469	5.609577293
Feb-23	7.7	23.1	13.941577	3.519270077
Feb-23	7.02	21.4	36.98261988	6.435097843
Feb-23	7.11	19.8	33.93054284	6.863081442
Feb-23	7.16	17.2	32.20111877	7.919624103
Feb-23			60.91184485	
Feb-23			60.91184485	
Feb-23	7.1	21.8	34.2742215	6.06080256
Feb-23	7.21	25.2	23.69056976	4.603771367
Feb-23	7.09	23.4	31.25443969	5.491676225
Feb-23	6.93	23	37.24433316	5.997463382
Feb-23	7.02	19.7	36.98261988	7.180507738
Feb-23	6.82	21.3	43.23216642	6.916156829
Feb-23	6.89	21.2	41.1503263	6.822299784
Feb-23	7.15	23.4	29.38660819	5.337079795
Feb-23	7.07	22	35.29926205	6.06384133
Feb-23	7.1	20.3	34.2742215	6.676212267
Mar-23	6.97	21.8	38.62604988	6.390766258

Mar-23	6.98	19.1	38.30100826	7.578361474
Mar-23	7.09	16.6	34.61695848	8.513436959
Mar-23	7.04	19.8	36.31352603	7.077056845
Mar-23	7.07	21.4	35.29926205	6.30300757
Mar-23	7.2	21	30.80976103	6.068939758
Mar-23	7.02	21.5	36.98261988	6.393742691
Mar-23	6.99	21.4	37.97407276	6.50979327
Mar-23	7.06	21.4	35.63865871	6.330192289
Mar-23	6.99	22.9	35.73633318	5.909723978
Mar-23	6.95	23.9	34.01619037	5.621063757
Mar-23	6.91	23.3	36.90025689	5.921119722
Mar-23	6.96	23.1	36.051269	5.897942192
Mar-23	6.98	24.3	32.09467758	5.419700862
Mar-23	7	23.6	33.42979679	5.627663343
Mar-23	7.01		37.31480515	
Mar-23	6.95	23.8	34.2993329	5.657421171
Mar-23	6.91	23.9	35.1098836	5.696444132
Mar-23	7.01	22.8	35.40821132	5.902793429
Mar-23	6.98	22.7	36.6465434	6.008627989
Mar-23	6.97	23.4	34.87410793	5.764384391
Mar-23	6.9	21.6	40.84275758	6.627973441
Mar-23	7.03	20.7	36.64883434	6.705332919
Mar-23	6.88	22.8	39.33729125	6.17240479
Mar-23	6.87	20.3	41.75807982	7.273643231
Mar-23	6.92	21.9	40.22050125	6.459510463
Mar-23	6.92	22.6	38.80344543	6.174468879
Mar-23	6.83	21.6	42.94270147	6.765359548
Mar-23	6.76	22.1	44.90991883	6.668519822
Mar-23	6.69	23	43.61661899	6.390464103
Mar-23	6.81	22.5	42.33508939	6.418230363
Apr-23	6.5	24.2	43.03106763	6.107390844
Apr-23	6.7	25.3	35.85162487	5.498362701
Apr-23	6.63	24.7	39.05448258	5.793599366
Apr-23	6.88	23.4	37.42867484	5.938194243
Apr-23	6.89	21.1	41.1503263	6.866426872
Apr-23	6.88	23.1	38.37111783	6.054167044
Apr-23	6.66	24.3	39.77759002	5.911795599
Apr-23	6.8	24.9	34.92405236	5.51242498
Apr-23	6.45	26.9	35.02539838	5.165010648
Apr-23	6.61	25.3	37.51190609	5.593510133
Apr-23	6.95	27	26.30786917	4.602761919
Apr-23	7.14	26.8	22.40522077	4.307886403
Apr-23	7.08	27.1	23.22617409	4.345542439
Apr-23	6.98	25.5	29.05581202	5.016205459
Apr-23	7.02	25.6	27.82405891	4.908571874
Apr-23	7.05	24.2	30.39800124	5.307031864
Apr-23	7	23.4	33.98863603	5.700698982
Apr-23	7.12	25.5	25.47893227	4.730112764
Apr-23	7.12	24.1	28.6141747	5.176920482
Apr-23	7.16	22.5	31.32519413	5.627358309
Apr-23	7.31	23.4	24.37567875	4.866013509
Apr-23	7.07	24.9	28.14416944	5.029766555

Apr-23	6.97	24.6	31.57207366	5.335227384
Apr-23	6.96	25	30.79786114	5.217957189
Apr-23	6.98	24.3	32.09467758	5.419700862
Apr-23	6.9	23.6	36.26919087	5.826137896
Apr-23	7.01	24.1	31.79098532	5.428221804
Apr-23	6.89	24.8	33.08233032	5.409172098
Apr-23	7.04	24.1	30.93792849	5.363554328
Apr-23	6.88	24.3	34.73797124	5.603435789
May-23	7	23.3	34.2715492	5.737571482
May-23	6.86	23.5	37.65937695	5.935045008
May-23	7.04	23.3	33.05911561	5.647453764
May-23	6.87	23.2	38.33216337	6.033259359
May-23	6.96	23.7	34.30208798	5.674146068
May-23	7.09	24.8	27.8299046	5.017702686
May-23	7.1	24.8	27.55436516	4.994938397
May-23	7.21	21.3	30.4615989	5.919891507
May-23	7.24	24.8	23.6501119	4.643724056
May-23	7.92	21.4	10.18448046	2.988127067
May-23			60.91184485	
May-23			60.91184485	
May-23	7.11	24.4	28.19769562	5.101749758
May-23	7.07	23.6	31.34645526	5.469502545
May-23	7.1	24.1	29.20050817	5.225527486
May-23			60.91184485	
May-23	7.16	22.9	30.30356835	5.484089941
May-23			60.91184485	
May-23	7.16	23.5	28.83326152	5.27599735
May-23	7.03	24.3	30.71022344	5.316433004
May-23	7.05	25.4	27.51978448	4.911924641
May-23	6.98	24.3	32.09467758	5.419700862
May-23	7.02	24.3	30.98992207	5.337712211
May-23	6.95	24.4	32.63515452	5.442751565
May-23	7.05	25.1	28.21272453	5.007854419
May-23	7.01	23.5	33.41211662	5.642318337
May-23	6.87	23.9	36.17123444	5.767027141
May-23	7.11	22.8	32.19686734	5.656127003
May-23	7.02	23.7	32.57020441	5.548238921
May-23	7.25	21.7	29.07042542	5.637662634
May-23	7.76	25.4	10.39139076	2.832034506
Jun-23	6.79	25.2	34.28488581	5.42060059
Jun-23	6.91	22.3	40.0893846	6.315443329
Jun-23	6.94	21.7	39.58913092	6.499910711
Jun-23	6.93	25.2	31.03560408	5.204363293
Jun-23	6.84	25.1	33.44622694	5.383851095
Jun-23	6.84	23.4	38.50766033	6.007489768
Jun-23	6.72	23.2	42.19860354	6.26871098
Jun-23	6.88	23.5	37.11969946	5.900032441
Jun-23	6.91	24.1	34.53260887	5.623463005
Jun-23	6.84	23.3	38.82818876	6.046346611
Jun-23	6.66	27	31.80083089	4.96728879
Jun-23	6.61	25.3	37.51190609	5.593510133
Jun-23	6.91	24.9	32.31687732	5.340769593

Jun-23	6.89	25.8	30.45061677	5.071434248
Jun-23	6.86	24.3	35.24302116	5.636688262
Jun-23	6.96	25.8	28.82176391	4.955648693
Jun-23	6.83	25.2	33.39736263	5.3640261
Jun-23	6.88	25.1	32.50906293	5.321749152
Jun-23	6.94	24.8	31.82722529	5.322398534
Jun-23	7.08	24.4	29.0521098	5.171827077
Jun-23	7.06	25.8	26.37206643	4.766689933
Jun-23	7.46	23.5	19.70519583	4.327011497
Jun-23	7.09	26.4	24.37315316	4.525899693
Jun-23	7.45	25.3	17.22117083	3.884582455
Jun-23	7.2	24.6	25.18321309	4.811858266
Jun-23	7.03	25.3	28.26721202	4.984485597
Jun-23	6.95	25.2	30.54117021	5.169142579
Jun-23	7.11	25.1	26.60808494	4.876622663
Jun-23	7.24	24.6	24.0454661	4.703990162
Jun-23	7.32	23.7	23.47531157	4.741270844
Jul-23	7.27	28.3	17.06826715	3.639439206
Jul-23	7.21	29.5	16.5872926	3.489102657
Jul-23	7.29	29.1	15.58415232	3.413450991
Jul-23	7.45	23.7	19.66358386	4.306697263
Jul-23	7.46	25.9	16.150306	3.706705215
Jul-23	7.47	25	17.14939678	3.895660069
Jul-23	7.3	26.1	19.73546618	4.115344003
Jul-23	7.25	25.9	21.33409368	4.300303261
Jul-23	7.22	27	20.17362446	4.076367096
Jul-23	7.33	26.8	17.92303464	3.856293758
Jul-23	7.38	26.4	17.33819573	3.819810301
Jul-23	7.35	27.5	16.47591044	3.635640334
Jul-23	7.27	26.9	19.16855749	3.983221608
Jul-23	7.2	27.8	19.31573063	3.914829269
Jul-23	7.24	28.4	17.54822523	3.681852658
Jul-23	7.2	25.6	23.1798777	4.511415492
Jul-23	7.44	29.7	12.1309329	2.948833113
Jul-23	7.54	26.9	13.18749919	3.241110475
Jul-23	7.38	32.7	10.28499065	2.544730503
Jul-23	7.31	33.1	10.90829106	2.603594289
Jul-23	7.34	26.1	18.74810955	4.006811882
Jul-23			60.91184485	
Jul-23	7.3	27.6	17.42799351	3.735993775
Jul-23	7.17	27.6	20.30402368	4.029641289
Jul-23	7.28	26.7	19.25147103	4.009925529
Jul-23	7.19	27.4	20.19253284	4.038973316
Jul-23			60.91184485	
Jul-23	7.29	24.7	22.44311755	4.533083009
Jul-23	7.13	27.2	21.90247149	4.218778105
Jul-23	7.28	27.2	18.46987347	3.882722095
Jul-23	7.17	28.3	19.15940912	3.851823583
Aug-23	7.53	27.5	12.74183314	3.146746459
Aug-23	7.21	27.5	19.57832374	3.969298386
Aug-23	7.36	24.7	20.50631489	4.324298003
Aug-23	7	24.1	32.07256815	5.449141798

Aug-23	7.19	27.5	20.02584258	4.013016856
Aug-23	7.45	26.1	16.11620098	3.689303164
Aug-23	7.28	26.9	18.93493943	3.95855157
Aug-23	7.5	27.2	13.6696517	3.294985515
Aug-23	7.45	26.5	15.59059445	3.595376242
Aug-23	7.4	26.8	16.31956849	3.66753855
Aug-23	7.27	24.6	23.19473589	4.619920148
Aug-23	7.48	25.7	15.9465733	3.692522207
Aug-23	7.11	23.7	29.88227225	5.337269745
Aug-23	7.07	23.6	31.34645526	5.469502545
Aug-23	7.1	24.1	29.20050817	5.225527486
Aug-23	7.19	24	26.76645141	5.028876659
Aug-23	7.16	22.9	30.30356835	5.484089941
Aug-23	7.25	24	24.97320014	4.860702977
Aug-23	7.25	24	24.97320014	4.860702977
Aug-23	7.32	26.6	18.45913581	3.93273574
Aug-23	7.29	23.3	25.20479586	4.961279244
Aug-23	7.4	26	17.43848175	3.861665813
Aug-23	7.34	22.9	24.44316743	4.924917423
Aug-23	7.4	25.7	17.87757757	3.93708406
Aug-23	7.12	27.2	22.12999034	4.239078844
Aug-23	7.25	26.8	19.80041067	4.057878912
Aug-23	7.42	26.2	16.68032494	3.754150203
Aug-23	7.84	27.6	7.513284784	2.226925095
Aug-23	7.52	26.2	14.40968733	3.452848814
Aug-23	7.47	26.4	15.27034498	3.559434895
Aug-23	7.17	28.3	19.15940912	3.851823583
Sep-23	7.3	26.7	18.7779159	3.959188177
Sep-23	7.11	23.6	30.13100505	5.371791561
Sep-23	7.33	25.8	19.47204409	4.113107965
Sep-23	7.47	25.3	16.728186	3.821035334
Sep-23	7.46	24.9	17.54610627	3.953557405
Sep-23	7.44	24.8	18.20933981	4.044363615
Sep-23	7.41	24.8	18.99689123	4.140643274
Sep-23	7.35	23.3	23.33723624	4.766294937
Sep-23	7.16	26.2	23.05121233	4.433069793
Sep-23	7.44	25.9	16.62241805	3.7674734
Sep-23	7.37	25.1	19.57367408	4.184106157
Sep-23	7.44	24.5	18.66784561	4.123349946
Sep-23	7.37	25.6	18.77899527	4.05137734
Sep-23	7.49	25.2	16.3770909	3.781063808
Sep-23	7.24	25.8	21.76873537	4.353779246
Sep-23	7.2	26.4	21.69257663	4.28462509
Sep-23	7.34	26.8	17.69120775	3.830001579
Sep-23	7.28	25.6	21.08938524	4.304634748
Sep-23	7.3	23.6	24.27992772	4.835107607
Sep-23	7.4	22.5	23.30819652	4.839212434
Sep-23	7.24	24.4	24.44742936	4.765038399
Sep-23	7.12	24.8	27.00108552	4.948476296
Sep-23	7.33	24.5	21.68760247	4.472703502
Sep-23	7.32	26	19.40043041	4.087848246
Sep-23	7.59	25	14.27349589	3.493559717

Sep-23	7.26	25.9	21.07946426	4.274532112
Sep-23	7.25	26.6	20.13141018	4.110541938
Sep-23	7.33		26.31411291	
Average		23.20771429	30.70029876	5.526027849
Min	6.45	15.2	7.513284784	2.226925095
Max	7.92	33.1	60.91184485	9.608704391
Std Dev	0.43577064	2.968019209	9.596257955	1.269173405

Table C2. Daily BOD Loading Comparison
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, AZ

All 2023 BOD Data						2023 Dates with BOD > 40650 Lbs					
Date	Influent (mg/L)	Flow (MGD)	Influent (lbs)	Effluent (mg/L)	Removal Efficiency (%)	Date	Influent (mg/L)	Flow (MGD)	Influent (lbs)	Effluent (mg/L)	Removal Efficiency (%)
1/11/2023	858	5.46	39070	21	97.6%	1/12/2023	1,290	5.13	55,192	16	98.8%
1/12/2023	1290	5.13	55192	16	98.8%	1/17/2023	918	5.54	42,415	13	98.6%
1/16/2023	448	5.68	21222	12	97.3%	1/19/2023	1,020	5.26	44,746	16	98.4%
1/17/2023	918	5.54	42415	13	98.6%	1/26/2023	1,660	5.05	69,914	22	98.7%
1/18/2023	890	5.31	39414	9	99.0%	1/30/2023	1,220	5.55	56,470	17	98.6%
1/19/2023	1020	5.26	44746	16	98.4%	1/31/2023	956	5.51	43,931	15	98.4%
1/26/2023	1660	5.05	69914	22	98.7%	2/1/2023	920	5.42	41,587	17	98.2%
1/30/2023	1220	5.55	56470	17	98.6%	2/2/2023	1,770	5.37	79,271	17	99.0%
1/31/2023	956	5.51	43931	15	98.4%	2/7/2023	1,210	5.71	57,622	11	99.1%
2/1/2023	920	5.42	41587	17	98.2%	2/8/2023	1,080	5.79	52,152	14	98.7%
2/2/2023	1770	5.37	79271	17	99.0%	2/9/2023	1,320	5.85	64,401	12	99.1%
2/6/2023	488	5.75	23402	12	97.5%	2/15/2023	1,120	5.66	52,869	14	98.8%
2/7/2023	1210	5.71	57622	11	99.1%	2/16/2023	1,040	6.55	56,812	20	98.1%
2/8/2023	1080	5.79	52152	14	98.7%	2/20/2023	761	7.1	45,062	13	98.3%
2/9/2023	1320	5.85	64401	12	99.1%	2/21/2023	1,260	6.26	65,783	14	98.9%
2/15/2023	1120	5.66	52869	14	98.8%	2/22/2023	1,100	6.2	56,879	15	98.6%
2/16/2023	1040	6.55	56812	20	98.1%	3/1/2023	786	6.52	42,740	14	98.2%
2/20/2023	761	7.1	45062	13	98.3%	3/14/2023	1,620	6.28	84,848	18	98.9%
2/21/2023	1260	6.26	65783	14	98.9%	3/15/2023	937	6.51	50,873	15	98.4%
2/22/2023	1100	6.2	56879	15	98.6%	3/21/2023	1,720	6.51	93,385	10	99.4%
2/27/2023	784	5.93	38774	14	98.2%	3/22/2023	1,070	6.31	56,309	12	98.9%
3/1/2023	786	6.52	42740	14	98.2%	3/23/2023	1,270	6.23	65,987	14	98.9%
3/6/2023	673	6.19	34743	12	98.2%	4/5/2023	935	5.7	44,448	13	98.6%
3/14/2023	1620	6.28	84848	18	98.9%	4/13/2023	1,190	6.02	59,746	7	99.4%
3/15/2023	937	6.51	50873	15	98.4%	4/19/2023	1,180	6.06	59,638	10	99.2%
3/21/2023	1720	6.51	93385	10	99.4%	5/2/2023	1,020	7.35	62,525	11	98.9%
3/22/2023	1070	6.31	56309	12	98.9%	5/3/2023	1,030	7.06	60,647	17	98.3%
3/23/2023	1270	6.23	65987	14	98.9%	5/10/2023	845	5.84	41,156	8	99.1%
4/3/2023	514	5.65	24220	8	98.4%	6/7/2023	1,110	6.42	59,433	13	98.8%
4/5/2023	935	5.7	44448	13	98.6%	6/14/2023	1,190	5.2	51,608	5	99.6%
4/10/2023	686	5.23	29922	7	99.0%	8/16/2023	765	6.87	43,831	2	99.7%
4/11/2023	766	5.79	36989	8	99.0%	9/20/2023	751	6.61	41,401	2	99.7%
4/13/2023	1190	6.02	59746	7	99.4%	9/27/2023	878	6.19	45,326	2	99.8%

4/17/2023	677	5.87	33143	16	97.6%
4/19/2023	1180	6.06	59638	10	99.2%
4/24/2023	576	6.77	32522	12	97.9%
5/2/2023	1020	7.35	62525	11	98.9%
5/3/2023	1030	7.06	60647	17	98.3%
5/10/2023	845	5.84	41156	8	99.1%
5/17/2023	583	6.65	32334	11	98.1%
5/24/2023	570	4.72	22438	5	99.1%
5/31/2023	592	6.27	30957	5	99.2%
6/7/2023	1110	6.42	59433	13	98.8%
6/14/2023	1190	5.2	51608	5	99.6%
6/21/2023	568	7.7	36476	18	96.8%
7/5/2023	700	5.69	33218	2	99.7%
7/12/2023	496	6.58	27219	1	99.8%
7/19/2023	606	6.23	31487	3	99.5%
7/26/2023	660	6.06	33357	3	99.5%
8/2/2023	621	6.67	34545	2	99.7%
8/9/2023	652	6.46	35127	1	99.8%
8/16/2023	765	6.87	43831	2	99.7%
8/23/2023	591	6.87	33862	2	99.7%
8/30/2023	491	7.07	28951	1	99.8%
9/6/2023	546	7.02	31967	2	99.6%
9/13/2023	608	6.67	33822	2	99.7%
9/20/2023	751	6.61	41401	2	99.7%
9/27/2023	878	6.19	45326	2	99.8%
10/4/2023	555	6.54	30272	3	99.5%
10/11/2023	941	6.35	49834	2	99.8%
11/1/2023	600	6.72	33627	100	83.3%
11/2/2023	690	6.98	40167	100	85.5%
11/8/2023	1000	6.55	54627	15	98.5%
11/15/2023	380	6.78	21487	5	98.7%
11/19/2023	320	3.97	10595	25	92.2%
11/29/2023	500	6.65	27731	17	96.6%
12/6/2023	700	6.53	38122	12	98.3%
Average	870	6.13	44,099	13	98.3%
Max	1,770	7.70	93,385	100	99.8%
Min	320	3.97	10,595	1	83.3%

10/11/2023	941	6.35	49,834	2	99.8%
11/8/2023	1,000	6.55	54,627	15	98.5%
Average	1,111	6.07	55,813	12	98.9%
Max	1,770	7.35	93,385	22	99.8%
Min	751	5.05	41,156	2	98.1%

Appendix D: Site-Specific Data

Table D1. Flow Summary Industrial Pretreatment Program: Local Limits Evaluation City of Tolleson, AZ			
Date	Flow, mgd		
	Combined	Tolleson	SROG
1/1/2023	6.09	1.12	4.97
1/2/2023	4.83	1.53	3.3
1/3/2023	2.78	2.78	0
1/4/2023	2.85	2.85	0
1/5/2023	2.71	2.71	0
1/6/2023	2.66	2.66	0
1/7/2023	4.03	2.45	1.58
1/8/2023	4.55	1.34	3.21
1/9/2023	5.34	2.44	2.9
1/10/2023	3.22	2.71	0.51
1/11/2023	5.46	2.8	2.66
1/12/2023	5.13	2.63	2.5
1/13/2023	5.31	2.5	2.81
1/14/2023	5.35	2.39	2.96
1/15/2023	4.77	1.49	3.28
1/16/2023	5.68	2.59	3.09
1/17/2023	5.54	2.58	2.95
1/18/2023	5.31	2.62	2.69
1/19/2023	5.26	2.68	2.59
1/20/2023	5.35	2.59	2.76
1/21/2023	4.38	1.47	2.91
1/22/2023	4.09	1.21	2.88
1/23/2023	5.01	2.31	2.7
1/24/2023	5.16	2.66	2.5
1/25/2023	5.12	2.63	2.49
1/26/2023	5.05	2.7	2.36
1/27/2023	5.32	2.61	2.72
1/28/2023	5.06	2.44	2.62
1/29/2023	4.5	1.42	3.08
1/30/2023	5.55	2.45	3.1
1/31/2023	5.51	2.68	2.83
2/1/2023	5.42	2.65	2.77
2/2/2023	5.37	2.64	2.73
2/3/2023	5.75	2.66	3.09
2/4/2023	4.93	1.71	3.22
2/5/2023	4.96	1.24	3.72
2/6/2023	5.75	2.47	3.28
2/7/2023	5.71	2.58	3.12
2/8/2023	5.79	2.76	3.04
2/9/2023	5.85	2.64	3.21
2/10/2023	5.93	2.56	3.36
2/11/2023	5.76	2.33	3.44
2/12/2023	5.14	1.34	3.79
2/13/2023	6.07	2.46	3.61
2/14/2023	5.5	2.58	2.92
2/15/2023	5.66	2.83	2.82

2/16/2023	6.55	2.67	3.88
2/17/2023	6.84	2.48	4.36
2/18/2023	5.96	1.41	4.55
2/19/2023	6.11	1.08	5.03
2/20/2023	7.1	2.54	4.56
2/21/2023	6.26	2.55	3.71
2/22/2023	6.2	2.79	3.41
2/23/2023	6.04	2.83	3.22
2/24/2023	5.94	2.77	3.17
2/25/2023	6.07	2.54	3.52
2/26/2023	5.25	1.47	3.78
2/27/2023	5.93	2.55	3.39
2/28/2023	6.23	2.83	3.4
3/1/2023	6.52	3.02	3.5
3/2/2023	6.18	2.88	3.3
3/3/2023	6.07	2.74	3.34
3/4/2023	5.28	1.63	3.65
3/5/2023	5.09	1.19	3.9
3/6/2023	6.19	2.48	3.71
3/7/2023	6.31	2.76	3.55
3/8/2023	6.28	2.92	3.36
3/9/2023	6.26	2.94	3.32
3/10/2023	6.41	2.76	3.64
3/11/2023	6.39	2.46	3.93
3/12/2023	5.46	1.3	4.17
3/13/2023	6.31	2.57	3.75
3/14/2023	6.28	2.53	3.75
3/15/2023	6.51	2.74	3.78
3/16/2023	6.45	2.83	3.63
3/17/2023	6.17	2.72	3.45
3/18/2023	5.98	2.51	3.47
3/19/2023	5.3	1.4	3.9
3/20/2023	6.27	2.59	3.68
3/21/2023	6.51	2.75	3.76
3/22/2023	6.31	2.75	3.56
3/23/2023	6.23	2.79	3.44
3/24/2023	5.77	2.01	3.77
3/25/2023	5.51	1.66	3.85
3/26/2023	5.26	1.45	3.81
3/27/2023	6.1	2.34	3.76
3/28/2023	6.1	2.62	3.48
3/29/2023	5.91	2.64	3.26
3/30/2023	4.54	2.87	1.67
3/31/2023	4.83	2.65	2.18
4/1/2023	5.2	2.33	2.87
4/2/2023	5.07	1.63	3.44
4/3/2023	5.65	2.51	3.14
4/4/2023	5.65	2.74	2.91
4/5/2023	5.7	2.69	3.01
4/6/2023	5.91	2.77	3.14
4/7/2023	5.58	2.53	3.05

4/8/2023	5.02	1.45	3.57
4/9/2023	4.65	0.86	3.78
4/10/2023	5.23	1.62	3.61
4/11/2023	5.79	2.47	3.32
4/12/2023	6.08	2.84	3.25
4/13/2023	6.02	2.76	3.27
4/14/2023	5.9	2.65	3.25
4/15/2023	5.7	2.5	3.21
4/16/2023	5.23	1.6	3.63
4/17/2023	5.87	2.5	3.37
4/18/2023	6.03	2.88	3.15
4/19/2023	6.06	2.78	3.28
4/20/2023	5.99	2.9	3.09
4/21/2023	5.93	2.8	3.13
4/22/2023	5.36	1.7	3.66
4/23/2023	6.01	1.32	4.69
4/24/2023	6.77	2.5	4.27
4/25/2023	5.51	2.92	2.59
4/26/2023	5.6	2.84	2.76
4/27/2023	5.6	2.72	2.88
4/28/2023	5.71	2.8	2.9
4/29/2023	5.03	1.68	3.35
4/30/2023	6.25	1.24	5.01
5/1/2023	7.1	2.45	4.65
5/2/2023	7.35	2.85	4.5
5/3/2023	7.06	2.87	4.19
5/4/2023	5.55	2.64	2.91
5/5/2023	4.49	2.52	1.96
5/6/2023	4.59	1.62	2.98
5/7/2023	5.56	1.34	4.22
5/8/2023	6.29	2.71	3.58
5/9/2023	5.19	2.76	2.43
5/10/2023	5.84	2.84	3.01
5/11/2023	5.41	2.76	2.65
5/12/2023	6.54	2.6	3.94
5/13/2023	5.93	1.78	4.15
5/14/2023	5.8	1.34	4.46
5/15/2023	6.49	2.73	3.77
5/16/2023	6.62	2.76	3.86
5/17/2023	6.65	2.74	3.91
5/18/2023	6.8	3.08	3.72
5/19/2023	6.51	2.53	3.98
5/20/2023	5.92	1.67	4.24
5/21/2023	5.29	1.39	3.89
5/22/2023	5.76	2.41	3.34
5/23/2023	5.1	2.69	2.41
5/24/2023	4.72	2.74	1.98
5/25/2023	5.79	2.76	3.03
5/26/2023	5.73	2.53	3.2
5/27/2023	5.32	2.04	3.28
5/28/2023	4.49	1.1	3.38

5/29/2023	4.6	1.26	3.34
5/30/2023	6.04	2.42	3.62
5/31/2023	6.27	2.48	3.79
6/1/2023	6.25	2.58	3.67
6/2/2023	6.18	2.54	3.64
6/3/2023	6.08	2.12	3.96
6/4/2023	5.58	1.5	4.08
6/5/2023	6.17	2.37	3.8
6/6/2023	6.44	2.7	3.74
6/7/2023	6.42	2.7	3.72
6/8/2023	6.2	2.68	3.52
6/9/2023	6.25	2.68	3.57
6/10/2023	5.61	1.63	3.97
6/11/2023	5.46	1.51	3.95
6/12/2023	6.22	2.49	3.73
6/13/2023	5.64	2.85	2.8
6/14/2023	5.2	2.73	2.46
6/15/2023	5.44	2.82	2.62
6/16/2023	5.68	2.23	3.44
6/17/2023	5.72	1.91	3.81
6/18/2023	5.96	1.58	4.37
6/19/2023	5.91	2.71	3.21
6/20/2023	6.25	2.79	3.45
6/21/2023	7.7	2.83	4.87
6/22/2023	6.98	2.85	4.13
6/23/2023	5.07	2.89	2.18
6/24/2023	4.6	2.51	2.1
6/25/2023	4.13	1.81	2.32
6/26/2023	5.76	2.54	3.22
6/27/2023	6.21	2.91	3.29
6/28/2023	4.93	2.87	2.06
6/29/2023	4.34	2.85	1.49
6/30/2023	5.05	2.72	2.33
7/1/2023	4.84	1.91	2.93
7/2/2023	5.59	1.84	3.75
7/3/2023	6.41	2.79	3.62
7/4/2023	5.77	1.91	3.86
7/5/2023	5.69	2.52	3.17
7/6/2023	6.38	2.81	3.57
7/7/2023	6.54	2.87	3.67
7/8/2023	5.3	2.61	2.69
7/9/2023	4.39	1.98	2.41
7/10/2023	5.06	2.44	2.62
7/11/2023	5.31	2.84	2.47
7/12/2023	6.58	2.93	3.66
7/13/2023	7.01	2.87	4.14
7/14/2023	6.9	2.78	4.12
7/15/2023	6.67	2.37	4.3
7/16/2023	6.28	1.94	4.34
7/17/2023	5.88	2.59	3.29
7/18/2023	6.31	2.92	3.39

7/19/2023	6.23	3.01	3.22
7/20/2023	6.02	2.94	3.08
7/21/2023	6.07	2.84	3.23
7/22/2023	4.26	1.84	2.42
7/23/2023	4.24	1.77	2.46
7/24/2023	5.39	2.21	3.18
7/25/2023	6.07	2.81	3.26
7/26/2023	6.06	2.91	3.14
7/27/2023	6.23	2.98	3.25
7/28/2023	6.04	2.72	3.32
7/29/2023	5.19	2.71	2.48
7/30/2023	4.46	1.98	2.47
7/31/2023	5.99	2.79	3.2
8/1/2023	6.55	2.91	3.65
8/2/2023	6.67	3.01	3.66
8/3/2023	6.8	3.03	3.77
8/4/2023	6.42	2.93	3.49
8/5/2023	4.42	1.98	2.44
8/6/2023	4.28	1.87	2.42
8/7/2023	5.25	2.8	2.45
8/8/2023	6.05	3.12	2.93
8/9/2023	6.46	2.99	3.47
8/10/2023	6.54	2.99	3.54
8/11/2023	6.29	2.99	3.29
8/12/2023	4.5	2.15	2.35
8/13/2023	4.15	1.61	2.54
8/14/2023	5.25	2.14	3.12
8/15/2023	6.51	2.98	3.53
8/16/2023	6.87	3.05	3.82
8/17/2023	7.22	3.11	4.11
8/18/2023	7.15	3.09	4.06
8/19/2023	5.3	2.83	2.47
8/20/2023	5.3	2.83	2.47
8/21/2023	7.05	3	4.05
8/22/2023	7.11	3.05	4.06
8/23/2023	6.87	3.08	3.8
8/24/2023	7.01	3.02	3.99
8/25/2023	7.1	3.08	4.02
8/26/2023	4.99	2.4	2.59
8/27/2023	4.45	1.82	2.63
8/28/2023	6.94	2.93	4.01
8/29/2023	7.07	3.1	3.97
8/30/2023	7.07	3.1	3.97
8/31/2023	7.21	3.2	4
9/1/2023	7.34	3.36	3.98
9/2/2023	7.34	3.36	3.98
9/3/2023	4.07	1.65	2.42
9/4/2023	5.46	1.92	3.53
9/5/2023	6.79	2.88	3.92
9/6/2023	7.02	2.99	4.02
9/7/2023	6.9	2.92	3.97

9/8/2023	6.75	2.82	3.94
9/9/2023	4.92	2.07	2.85
9/10/2023	4.14	1.68	2.46
9/11/2023	6.17	2.76	3.41
9/12/2023	6.84	2.99	3.85
9/13/2023	6.67	2.87	3.8
9/14/2023	6.65	2.76	3.89
9/15/2023	6.73	2.69	4.04
9/16/2023	4.88	2.04	2.85
9/17/2023	2.98	1.61	1.37
9/18/2023	4.75	2.36	2.39
9/19/2023	6.71	2.66	4.04
9/20/2023	6.61	2.73	3.88
9/21/2023	6.59	2.7	3.9
9/22/2023	6.6	2.71	3.89
9/23/2023	4.71	1.71	3
9/24/2023	4.42	1.46	2.97
9/25/2023	5.99	2.52	3.47
9/26/2023	6.41	2.84	3.57
9/27/2023	6.19	2.77	3.42
9/28/2023	6.5	2.73	3.77
9/29/2023	6.41	2.78	3.63
9/30/2023	4.15	1.98	2.17
10/1/2023	3.57	1.53	2.04
10/2/2023	6.03	2.35	3.68
10/3/2023	6.76	2.8	3.96
10/4/2023	6.54	2.66	3.88
10/5/2023	4.29	2.61	1.68
10/6/2023	5.67	2.07	3.6
10/7/2023	3.79	1.34	2.45
10/8/2023	3.77	1.42	2.35
10/9/2023	6	2.42	3.57
10/10/2023	6.49	2.58	3.91
10/11/2023	6.35	2.56	3.79
10/12/2023	6.23	2.45	3.78
10/13/2023	8.63	3.52	5.11
10/14/2023	4.18	1.66	2.52
10/15/2023	3.67	1.17	2.5
10/16/2023	5.95	2.42	3.53
10/17/2023	6.27	2.51	3.76
10/18/2023	6.2	2.56	3.64
10/19/2023	6.38	2.57	3.81
10/20/2023	6.27	2.56	3.71
10/21/2023	3.89	1.47	2.43
10/22/2023	3.68	1.19	2.5
10/23/2023	5.97	2.14	3.83
10/24/2023	6.03	2.35	3.69
10/25/2023	6.48	2.61	3.87
10/26/2023	6.49	2.6	3.88
10/27/2023	6.76	2.54	4.22
10/28/2023	4.22	1.74	2.48

10/29/2023	3.72	1.29	2.43
10/30/2023	3.72	1.29	2.43
10/31/2023	6.14	2.49	3.65
11/1/2023	6.72	2.66	4.06
11/2/2023	6.98	2.91	4.07
11/3/2023	6.83	2.91	3.92
11/4/2023	4.64	2.15	2.49
11/5/2023	4.04	1.46	2.58
11/6/2023	6.11	2.46	3.65
11/7/2023	6.88	2.82	4.06
11/8/2023	6.55	2.78	3.77
11/9/2023	6.58	2.79	3.79
11/10/2023	6.59	2.6	3.99
11/11/2023	4.13	1.82	2.31
11/12/2023	3.87	1.38	2.49
11/13/2023	6.64	2.53	4.11
11/14/2023	6.57	2.75	3.82
11/15/2023	6.78	2.75	4.03
11/16/2023	6.85	2.75	4.1
11/17/2023	6.45	2.78	3.67
11/18/2023	4.72	2.08	2.64
11/19/2023	3.97	1.5	2.47
11/20/2023	6.28	2.35	3.93
11/21/2023	6.49	2.42	4.07
11/22/2023	6.45	2.43	4.02
11/23/2023	5.67	1.74	3.93
11/24/2023	5.88	2.28	3.61
11/25/2023	4.66	2.05	2.61
11/26/2023	3.99	1.46	2.53
11/27/2023	6.29	2.4	3.89
11/28/2023	6.57	2.49	4.09
11/29/2023	6.65	2.56	4.09
11/30/2023	6.52	2.47	4.05
12/1/2023	6.4	2.51	3.89
12/2/2023	4.19	1.65	2.54
12/3/2023	4.22	1.53	2.69
12/4/2023	6.42	2.64	3.78
12/5/2023	6.46	2.57	3.89
12/6/2023	6.53	2.59	3.95
12/7/2023	6.42	2.57	3.85
12/8/2023	6.2	2.47	3.73
12/9/2023	4.13	1.49	2.64
12/10/2023	3.91	1.04	2.87
12/11/2023	6.56	2.31	4.25
12/12/2023	6.69	2.56	4.12
Average	5.73	2.41	3.32
	Combined	Tolleson	SROG

Table D2. Industrial Flow Summary
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, AZ

Date	Blue Beacon Max Daily Flow (mg)	Blue Beacon Average Daily Flow (mgd)	Pepsico Max Daily Flow (mg)	Pepsico Average Daily Flow (mgd)	JBS Max Daily Flow (mg)	JBS Average Daily Flow (mgd)	Holsom Max Daily Flow (mg)	Holsom Average Daily Flow (mgd)	Tolleson Dairy Max Daily Flow (mg)	Tolleson Dairy Average Daily Flow (mgd)	I.U. Average Daily Flow (mgd)
Jan-22	0.055	0.043	0.457	0.194	0.786	0.542	0.009	0.007	0.229	0.154	0.939
Feb-22	0.051	0.042	0.357	0.228	0.791	0.629	0.006	0.005	0.241	0.152	1.056
Mar-22	0.051	0.037	0.433	0.258	0.798	0.672	0.006	0.005	0.221	0.148	1.120
Apr-22	0.048	0.036	0.565	0.298	0.772	0.566	0.014	0.008	0.242	0.159	1.067
May-22	0.044	0.035	0.384	0.274	0.768	0.538	0.013	0.011	1.938	0.227	1.085
Jun-22	0.048	0.036	0.519	0.309	0.761	0.587	0.041	0.031	0.287	0.212	1.176
Jul-22	0.042	0.032	0.554	0.299	0.797	0.550	0.028	0.026	0.311	0.193	1.100
Aug-22	0.059	0.033	0.484	0.297	0.789	0.560	0.048	0.031	0.272	0.202	1.123
Sep-22	0.064	0.042	0.851	0.366	0.777	0.573	0.013	0.010	0.290	0.211	1.202
Oct-22	0.057	0.047	0.545	0.233	0.703	0.484	0.019	0.014	0.286	0.206	0.984
Nov-22	0.071	0.054	0.314	0.178	0.694	0.511	0.01	0.008	0.298	0.184	0.935
Dec-22	0.076	0.053	0.245	0.136	0.707	0.509	0.022	0.014	0.256	0.158	0.870
Total	0.666	0.490	5.708	3.069	9.143	6.721	0.229	0.170	4.871	2.207	12.657
Averages	0.056	0.041	0.476	0.256	0.762	0.560	0.019	0.014	0.406	0.184	1.05
Maximum	0.076	0.054	0.851	0.366	0.798	0.672	0.048	0.031	1.938	0.227	1.202
Minimum	0.042	0.032	0.245	0.136	0.694	0.484	0.006	0.005	0.221	0.148	0.870

Table D3. Influent and Effluent Summary for Conventional Pollutants
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, AZ

Date	Influent BOD (mg/L)	Effluent BOD (mg/L)	BOD % Removal	Influent TSS (mg/L)	Effluent TSS (mg/L)	TSS % Removal	Date	Influent Ammonia (mg/L)	Effluent Ammonia (mg/L)	Ammonia % Removal
Jan-23	1028.89	13.86	98.65%	634.46	22.22	96.50%	Jan-22	38.80	3.08	92.07%
Feb-23	1071.08	14.50	98.65%	630.67	14.74	97.66%	Feb-22	39.92	1.31	96.72%
Mar-23	1158.25	13.80	98.81%	575.00	18.63	96.76%	Mar-22	40.61	0.41	98.98%
Apr-23	842.00	10.73	98.73%	442.29	21.57	95.12%	Apr-22	32.98	0.41	98.76%
May-23	773.33	10.10	98.69%	486.29	18.13	96.27%	May-22	34.17	0.72	97.89%
Jun-23	956.00	11.67	98.78%	360.00	14.62	95.94%	Jun-22	30.21	0.26	99.16%
Jul-23	615.50	3.14	99.49%	377.00	5.78	98.47%	Jul-22	33.13	0.28	99.14%
Aug-23	624.00	1.90	99.70%	477.20	4.47	99.06%	Aug-22	35.70	0.27	99.24%
Sep-23	695.75	2.14	99.69%	434.50	4.64	98.93%	Sep-22	34.09	0.77	97.73%
Oct-23	748.00	2.50	99.67%	465.33	7.10	98.48%	Oct-22	33.95	0.73	97.84%
Nov-23	581.67	43.67	92.49%	413.00	16.53	96.00%	Nov-22	34.20	0.14	99.59%
Dec-23	863.75	18.43	97.87%	507.60	20.27	96.01%	Dec-22	29.72	4.43	85.09%
Average	829.85	12.20	98.43%	483.61	14.06	97.10%	Average	34.79	1.07	96.85%
Maximum	1158.25	43.67	99.70%	634.46	22.22	99.06%	Maximum	40.61	4.43	99.59%
Minimum	581.67	1.90	92.49%	360.00	4.47	95.12%	Minimum	29.72	0.140	85.09%

Table D4. Influent and Effluent Summary for Non-Conventional Pollutants
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Date	Antimony (mg/L)		Paired Sampling Removal Efficiency (%)	Arsenic (mg/L)		Paired Sampling Removal Efficiency (%)	Barium (mg/L)		Paired Sampling Removal Efficiency (%)	Beryllium (mg/L)		Paired Sampling Removal Efficiency (%)	Bis(2-ethyl (m
	Influent	Effluent		Influent	Effluent		Influent	Effluent		Influent	Effluent		Influent
3/5/2019	0.0023			0.0036									
3/6/2019										*0.0005*			
3/10/2019													
3/11/2019													
3/12/2019													*0.055*
3/14/2019		*0.0005*			0.0018						*0.0005*		
3/18/2019													
3/19/2019													
6/5/2019										*0.0005*			
6/10/2019	0.0016			0.0028									
6/12/2019													
6/25/2019													
8/27/2019	0.0016	*0.0005*		0.0027	0.0015					*0.0005*	*0.0005*		
11/29/2019	0.0011			0.0026	0.0024					*0.0005*			
12/2/2019													
12/3/2019													
12/9/2019													
2/25/2020	0.002	0.00069		0.0036	0.002					*0.0005*	*0.0005*		*0.055*
6/16/2020					0.0018						*0.0005*		
6/17/2020													
6/18/2020				0.0026						*0.0005*			
6/19/2020													*0.0055*
9/18/2020										*0.0005*			
9/21/2020											*0.0005*		*0.05*
9/22/2020													
9/24/2020													
9/25/2020	0.0015	0.0005		0.0032	0.0018								
9/29/2020													
12/7/2020													
12/10/2020													
12/11/2020				0.003	0.0034					*0.0005*	*0.0005*		*0.05*
3/9/2021	0.0018	0.00066		0.0037	0.0028					0.00016	0.00014	0.125	0.0091
3/10/2021													
6/14/2021	0.0016	*0.0005*		0.0034	0.004					*0.0005*	*0.0005*		*0.0215*
6/15/2021													
9/20/2021	0.0013	*0.0005*		0.0035	0.0016					*0.0005*	*0.0005*		*0.022*
9/21/2021													
9/22/2021													
9/23/2021													
9/24/2021													
12/6/2021	0.002	*0.0005*		0.0031	0.0016								*0.05*
3/14/2022	0.0016	0.00078		0.0029	0.0026					*0.0005*	0.00012		0.0034
3/15/2022													
6/9/2022	0.0013	*0.0005*		0.003	0.0027					*0.0005*	*0.0005*		*0.005*
6/10/2022													
6/14/2022	0.0016			0.0034	0.004								
5/30/2023							0.12	0.039					0.0049
6/1/2023							0.1	0.048					0.0034
6/5/2023							0.12	0.044					
6/7/2023							0.12	0.051					
6/8/2023							0.13	0.05					
6/12/2023							0.13	0.048					
8/30/2023	0.0051	0.00042		0.0026	0.0018		0.085	0.033		*0.000037*	*0.000037*		0.0061
8/31/2023													
Average	0.0018857	0.00055		0.0031063	0.0023867		0.115	0.0447143		0.000442643	0.00039975		0.00538
Historical Average													
Maximum	0.0051	0.00078		0.0037	0.004		0.13	0.051		0.0005	0.0005		0.055
Minimum	0.0011	0.00042		0.0026	0.0015		0.085	0.033		0.000037	0.000037		0.0034
Standard Deviation													
Literature Removal Efficiences													
Removal Efficiencies (%)	70.8%	Used in Calcs (%)	70.8%	23.2%	Used in Calcs (%)	23.2%	61.1%	Used in Calcs (%)	61.1%	9.7%	Used in Calcs (%)	9.7%	86.6%

Abbreviations:
mg/L - milligrams per liter.
Notes:
Values in italics were nondetect and are reported at half the detection limit, or half the reporting limit if the detection limit is unavailable
A light orange cell indicates data points that are not used (e.g., high detection limits that skew averages)
Values in red are literature removal efficiencies

Table D4. Influent an
Industrial Pretreatme
Tolleson, AZ

Date	ıexly) Pthalate ıg/L) Effluent	Paired Sampling Removal Efficiency (%)	Boron (mg/L) Influent	Boron (mg/L) Effluent	Paired Sampling Removal Efficiency (%)	Cadmium (mg/L) Influent	Cadmium (mg/L) Effluent	Paired Sampling Removal Efficiency (%)	Chromium (mg/L) Influent	Chromium (mg/L) Effluent	Paired Sampling Removal Efficiency (%)	cis-1,2,- Dichloroethylene (mg/L) Influent	cis-1,2,- Dichloroethylene (mg/L) Effluent
3/5/2019													
3/6/2019			0.42			0.0015			0.021				
3/10/2019													
3/11/2019													
3/12/2019													
3/14/2019	*0.0055*			0.38			*0.0005*			*0.005*			
3/18/2019													
3/19/2019													
6/5/2019			0.39			*0.0005*			0.011				
6/10/2019													
6/12/2019													
6/25/2019													
8/27/2019			0.38	0.37		*0.0005*	*0.0005*		0.011	*0.005*			
11/29/2019			0.4	0.35		*0.0005*			*0.005*				
12/2/2019													
12/3/2019													
12/9/2019													
2/25/2020	*0.0055*		0.42	0.35		*0.0005*	*0.0005*		0.013	*0.005*			
6/16/2020	*0.0055*			0.32			*0.0005*			*0.005*			
6/17/2020													
6/18/2020			0.39			*0.0005*			*0.005*				
6/19/2020													
9/18/2020			0.37			0.0025			0.024				
9/21/2020	0.00063			0.38			0.0025			*0.005*			
9/22/2020													
9/24/2020													
9/25/2020													
9/29/2020													
12/7/2020	0.00081												
12/10/2020													
12/11/2020			0.37	0.36		*0.0005*	*0.0005*		*0.005*	*0.005*			
3/9/2021	0.0015		0.49	0.39					0.015	0.00097			
3/10/2021													
6/14/2021	*0.0055*		0.43	0.39		*0.0005*	*0.0005*		*0.005*	*0.005*			
6/15/2021													
9/20/2021	*0.0055*		0.43	0.4		*0.0005*	*0.0005*		*0.005*	*0.005*			
9/21/2021													
9/22/2021													
9/23/2021													
9/24/2021													
12/6/2021	*0.0055*												
3/14/2022	0.0019		0.41	0.4		*0.0005*	*0.0005*		0.01	*0.005*			
3/15/2022													
6/9/2022	*0.005*		0.45	0.41		*0.0005*	*0.0005*		0.012	*0.005*			
6/10/2022													
6/14/2022			0.43	0.39									
5/30/2023	*0.00006*					0.00021	*0.0000115*					*0.31*	*0.31*
6/1/2023	*0.000065*					0.00017	0.000023					*0.31*	*0.31*
6/5/2023						0.00019	0.00004					*0.31*	*0.31*
6/7/2023						0.00024	0.000059					*0.31*	*0.31*
6/8/2023						0.00023	*0.0000115*					*0.31*	*0.31*
6/12/2023						0.00022	*0.0000115*					*0.31*	*0.31*
8/30/2023	*0.000065*		0.42	0.4		0.00018	*0.0000115*		0.0091	0.00096		*0.31*	*0.31*
8/31/2023													
Average	0.000718571		0.4133333	0.3778571		0.0002057	0.000024		0.0107929	0.0043275		0.31	0.31
Historical Average													
Maximum	0.0055		0.49	0.41		0.0025	0.0025		0.024	0.005		0.31	0.31
Minimum	0.00006		0.37	0.32		0.00017	0.0000115		0.005	0.00096		0.31	0.31
Standard Deviation													
Literature Removal Efficiences													
Removal Efficiencies (%)	Used in Calcs (%)	86.6%	8.6%	Used in Calcs (%)	8.6%	88.3%	Used in Calcs (%)	88.3%	59.9%	Used in Calcs (%)	59.9%	0.0%	Used in Calcs (%)

Abbreviations:
mg/L - milligrams per liter.
Notes:
Values in italics were no
A light orange cell indicate
Values in red are literature

Table D4. Influent an
Industrial Pretreatme
Tolleson, AZ

Date	Paired Sampling Removal Efficiency (%)	Copper (mg/L)		Paired Sampling Removal Efficiency (%)	Cyanide (mg/L)		Paired Sampling Removal Efficiency (%)	Flouride (mg/L)		Paired Sampling Removal Efficiency (%)	Iron (mg/L)		Paired Sampling Removal Efficiency (%)
		Influent	Effluent		Influent	Effluent		Influent	Effluent		Influent	Effluent	
3/5/2019													
3/6/2019		0.13			*0.004*	0.0084							
3/10/2019													
3/11/2019													
3/12/2019													
3/14/2019			*0.005*										
3/18/2019													
3/19/2019													
6/5/2019		0.082											
6/10/2019													
6/12/2019													
6/25/2019													
8/27/2019		0.097	*0.005*										
11/29/2019		0.057											
12/2/2019													
12/3/2019													
12/9/2019													
2/25/2020		0.074	*0.005*		0.011	0.016							
6/16/2020			*0.005*			0.015							
6/17/2020													
6/18/2020		0.053			*0.004*								
6/19/2020													
9/18/2020		0.15											
9/21/2020			0.0075										
9/22/2020													
9/24/2020													
9/25/2020						*0.004*							
9/29/2020					*0.004*								
12/7/2020													
12/10/2020													
12/11/2020		0.068	0.011		*0.004*	0.01							
3/9/2021		0.11	0.011										
3/10/2021					0.012								
6/14/2021		0.088	*0.005*										
6/15/2021					*0.004*	0.0041							
9/20/2021		0.11	*0.005*										
9/21/2021					*0.004*	*0.004*							
9/22/2021													
9/23/2021													
9/24/2021													
12/6/2021					*0.004*	*0.004*							
3/14/2022		0.077	0.0089										
3/15/2022					0.011	0.015							
6/9/2022		0.076	0.011		0.0094								
6/10/2022						*0.004*							
6/14/2022		0.088											
5/30/2023					*0.00195*	0.014		0.39	0.69		1.5	0.21	
6/1/2023					0.0057	0.015		1.9	0.63		1.5	0.35	
6/5/2023					*0.00195*	0.012		16	0.67		1.5	0.28	
6/7/2023					0.0039	*0.00195*		1.2	0.62		1.9	0.44	
6/8/2023					*0.00195*	0.012		5.1	0.64		1.8	0.24	
6/12/2023					*0.00195*	*0.00195*		8	0.67		1.7	0.16	
8/30/2023		0.084	0.0043		*0.00195*	0.0065		1.5	0.69		1.7	0.12	
8/31/2023													
Average		0.0896	0.006975		0.0050417	0.0087		4.87	0.6585714		1.6571429	0.2571429	
Historical Average													
Maximum		0.15	0.011		0.012	0.016		16	0.69		1.9	0.44	
Minimum		0.053	0.0043		0.00195	0.00195		0.39	0.62		1.5	0.12	
Standard Deviation													
Literature Removal Efficiences													
Removal Efficiencies (%)		92.2%	Used in Calcs (%)	92.2%	-72.6%	Used in Calcs (%)	0	86.5%	Used in Calcs (%)	86.5%	84.5%	Used in Calcs (%)	84.5%

Abbreviations:
mg/L - milligrams per liter.
Notes:
Values in italics were no
A light orange cell indicate
Values in red are literature

Table D4. Influent an
Industrial Pretreatme
Tolleson, AZ

Date	Lead (mg/L)		Paired Sampling Removal Efficiency (%)	Mercury (mg/L)		Paired Sampling Removal Efficiency (%)	Molybdenum (mg/L)		Paired Sampling Removal Efficiency (%)	Nickel (mg/L)		Paired Sampling Removal Efficiency (%)
	Influent	Effluent		Influent	Effluent		Influent	Effluent		Influent	Effluent	
3/5/2019												
3/6/2019	*0.0075*						0.033			0.015		
3/10/2019												
3/11/2019												
3/12/2019												
3/14/2019		*0.0075*						0.011			*0.005*	
3/18/2019												
3/19/2019												
6/5/2019	*0.0075*						0.044			*0.005*		
6/10/2019												
6/12/2019												
6/25/2019												
8/27/2019	*0.0075*	*0.0075*					0.044	*0.005*				
11/29/2019	*0.0075*						0.019			*0.005*	*0.005*	
12/2/2019										*0.005*		
12/3/2019												
12/9/2019												
2/25/2020	0.0043	*0.0075*					0.031	0.013		0.0073	*0.005*	
6/16/2020		*0.0075*						0.018			*0.005*	
6/17/2020												
6/18/2020	*0.0075*						0.039			*0.005*		
6/19/2020												
9/18/2020	*0.0045*						0.023			*0.02*		
9/21/2020		*0.0045*						0.01			*0.02*	
9/22/2020												
9/24/2020												
9/25/2020												
9/29/2020												
12/7/2020												
12/10/2020												
12/11/2020	*0.0075*	*0.0075*					0.16	0.066		*0.005*	*0.005*	
3/9/2021							0.03	0.01				
3/10/2021												
6/14/2021	*0.0075*	*0.0075*					0.068	0.019		*0.005*	*0.005*	
6/15/2021												
9/20/2021	*0.0075*	*0.0075*					*0.005*	*0.005*		*0.005*	*0.005*	
9/21/2021												
9/22/2021												
9/23/2021												
9/24/2021												
12/6/2021												
3/14/2022	*0.0075*	*0.0075*					0.003	0.0024		*0.005*	*0.005*	
3/15/2022												
6/9/2022	*0.0075*	*0.0075*					*0.005*	*0.005*		*0.005*	*0.005*	
6/10/2022												
6/14/2022							0.068	0.019				
5/30/2023	*0.00135*	*0.00135*		*0.00000075*	0.00000343					0.006	*0.0026*	
6/1/2023	*0.00135*	*0.00135*		*0.00000075*	0.00000577					*0.0026*	*0.0026*	
6/5/2023	*0.00135*	*0.00135*		0.0000085	0.00000592					*0.0026*	*0.0026*	
6/7/2023	*0.00135*	*0.00135*		0.00000443	0.00000496					*0.0026*	*0.0026*	
6/8/2023	*0.00135*	*0.00135*		0.0000132	0.00000352					*0.0026*	*0.0026*	
6/12/2023	*0.00135*	*0.00135*		0.0000164	0.00000725					*0.0026*	*0.0026*	
8/30/2023	*0.00135*	*0.00135*		0.0000117	0.00000153		0.015	0.0041		*0.0026*	*0.0026*	
8/31/2023												
Average	0.0017188	0.00135		7.96143E-06	4.62571E-06		0.0391333	0.0144231		0.0057316	0.0048941	
Historical Average												
Maximum	0.0075	0.0075		0.0000164	0.00000725		0.16	0.066		0.02	0.02	
Minimum	0.00135	0.00135		0.00000075	0.00000153		0.003	0.0024		0.0026	0.0026	
Standard Deviation												
Literature Removal Efficiences												
Removal Efficiencies (%)	21.5%	Used in Calcs (%)	**55%**	41.9%	Used in Calcs (%)	41.9%	63.1%	Used in Calcs (%)	63.1%	14.6%	Used in Calcs (%)	**29%**

Abbreviations:
mg/L - milligrams per liter.
Notes:
Values in italics were no
A light orange cell indicate
Values in red are literature

Table D4. Influent an
Industrial Pretreatme
Tolleson, AZ

Date	Oil & Grease (HEM) (mg/L)		Paired Sampling Removal Efficiency (%)	Selenium (mg/L)		Paired Sampling Removal Efficiency (%)	Silver (mg/L)		Paired Sampling Removal Efficiency (%)	Styrene (mg/L)		Paired Sampling Removal Efficiency (%)
	Influent	Effluent		Influent	Effluent		Influent	Effluent		Influent	Effluent	
3/5/2019				0.0026			0.00016					
3/6/2019												
3/10/2019												
3/11/2019												
3/12/2019												
3/14/2019	44.9	*2.05*			0.00061			*0.00005*				
3/18/2019												
3/19/2019												
6/5/2019	134											
6/10/2019				0.0026			*0.00005*					
6/12/2019												
6/25/2019												
8/27/2019	156	*2.85*		0.0021	0.00098		*0.00005*	*0.00005*				
11/29/2019					0.00082		*0.00005*					
12/2/2019												
12/3/2019												
12/9/2019	23.2											
2/25/2020	51.9	*2.7*		0.0026	0.0008		0.00011	0.00006				
6/16/2020		*2.75*										
6/17/2020												
6/18/2020	11.8											
6/19/2020												
9/18/2020												
9/21/2020												
9/22/2020												
9/24/2020												
9/25/2020		*2.8*		0.0018	*0.00025*		0.00018	*0.00005*				
9/29/2020	74.7											
12/7/2020												
12/10/2020												
12/11/2020	9.9	*2.75*										
3/9/2021				0.0038	0.0016		0.000086	0.000046				
3/10/2021	76.5											
6/14/2021				0.0014	0.0006		*0.00005*	*0.00005*				
6/15/2021	37.6	*2.8*										
9/20/2021				0.0023	0.00076		*0.00005*	*0.00005*				
9/21/2021	69.1	*2.65*										
9/22/2021												
9/23/2021												
9/24/2021												
12/6/2021	27.8	*2.6*		0.0026	0.0011		*0.00005*	*0.00005*				
3/14/2022				0.0023	0.001		0.000058	0.000051				
3/15/2022	13.7	*2.7*										
6/9/2022	535			0.0027	*0.00025*		*0.00005*	*0.00005*				
6/10/2022		*2.6*										
6/14/2022				0.0014	0.0006							
5/30/2023										*0.000245*	*0.000245*	
6/1/2023										*0.000245*	*0.000245*	
6/5/2023										*0.000245*	*0.000245*	
6/7/2023										*0.000245*	*0.000245*	
6/8/2023										*0.000245*	*0.000245*	
6/12/2023										*0.000245*	*0.000245*	
8/30/2023				0.0016	0.00058		0.00019	*0.000006*		*0.000245*	*0.000245*	
8/31/2023												
Average	56.238462	2.6590909		0.0022923	0.0007654		0.00009	0.00005		0.000245	0.000245	
Historical Average												
Maximum	156	2.85		0.0038	0.0016		0.00019	0.00006		0.000245	0.000245	
Minimum	9.9	2.05		0.0014	0.00025		0.00005	0.000006		0.000245	0.000245	
Standard Deviation												
Literature Removal Efficiences												
Removal Efficiencies (%)	95.3%	Used in Calcs (%)	95.3%	66.6%	Used in Calcs (%)	66.6%	46.5%	Used in Calcs (%)	46.5%	0.0%	Used in Calcs (%)	0

Abbreviations:
mg/L - milligrams per liter.
Notes:
Values in italics were no
A light orange cell indicate
Values in red are literature

Table D4. Influent an
Industrial Pretreatme
Tolleson, AZ

Date	Thallium (mg/L)		Paired Sampling Removal Efficiency (%)	Xylenes (total) (mg/L)		Paired Sampling Removal Efficiency (%)	Zinc (mg/L)		Paired Sampling Removal Efficiency (%)
	Influent	Effluent		Influent	Effluent		Influent	Effluent	
3/5/2019	*0.00005*								
3/6/2019							0.61		
3/10/2019									
3/11/2019									
3/12/2019									
3/14/2019		*0.00005*						*0.025*	
3/18/2019									
3/19/2019									
6/5/2019							0.27		
6/10/2019	*0.00005*								
6/12/2019									
6/25/2019									
8/27/2019							0.26	*0.025*	
11/29/2019	*0.00005*	*0.00005*					0.19		
12/2/2019	*0.00005*								
12/3/2019									
12/9/2019									
2/25/2020							0.31	*0.032*	
6/16/2020	0.000059	0.00011						*0.025*	
6/17/2020									
6/18/2020							0.15		
6/19/2020									
9/18/2020							0.51		
9/21/2020								*0.01*	
9/22/2020									
9/24/2020									
9/25/2020									
9/29/2020	*0.00005*	*0.00005*							
12/7/2020									
12/10/2020									
12/11/2020							0.22	0.064	
3/9/2021	0.000031						0.34	0.054	
3/10/2021									
6/14/2021	*0.00005*	*0.00005*					0.24	*0.025*	
6/15/2021									
9/20/2021	*0.00005*	0.00011					0.25	*0.025*	
9/21/2021									
9/22/2021									
9/23/2021									
9/24/2021									
12/6/2021	*0.00005*	*0.00005*							
3/14/2022	*0.00005*	*0.00005*					0.24	0.032	
3/15/2022									
6/9/2022	*0.00005*	*0.00005*					0.27	*0.025*	
6/10/2022									
6/14/2022							0.24		
5/30/2023	*0.0000065*	*0.0000065*		*0.000495*	*0.000495*				
6/1/2023	0.000016	*0.0000065*	59%	0.002	*0.000495*				
6/5/2023	0.000014	*0.0000065*	54%	*0.000495*	*0.000495*				
6/7/2023	*0.0000065*	*0.0000065*		*0.000495*	*0.000495*				
6/8/2023	*0.0000065*	*0.0000065*		*0.000495*	*0.000495*				
6/12/2023	*0.0000065*	*0.0000065*		*0.000495*	*0.000495*				
8/30/2023	*0.0000065*	*0.0000065*		*0.000495*	*0.000495*		0.092	0.0067	
8/31/2023									
Average	8.92857E-06	0.0000065		0.00071	0.000495		0.2794667	0.0290583	
Historical Average									
Maximum	0.000059	0.00011		0.002	0.000495		0.61	0.064	
Minimum	0.0000065	0.0000065		0.000495	0.000495		0.092	0.0067	
Standard Deviation									
Literature Removal Efficiences									
Removal Efficiencies (%)	56.5%	Used in Calcs (%)	56.5%	30.3%	Used in Calcs (%)	30.3%	89.6%	Used in Calcs (%)	89.6%

Abbreviations:
mg/L - milligrams per liter.
Notes:
Values in italics were no
A light orange cell indicate
Values in red are literature

Table D5. Domestic and Commercial Background Data Summary
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, AZ

Parameter	Units	Collection System Location						Average	Maximum	Minumum	Standard Deviation
		95th Ave & Harrison	91st Ave & Harrison	7B	7B #2	93rd Ave & Taylor	91st Ave & Harrison #2				
Biochemical Oxygen Demand (BOD)	mg/L	370	790	470	330	790	*225*	437.0000	790.0000	225.0000	215.975
Suspended Solids, Total (TSS)	mg/L	260	230	190	150	1900	200	206.0000	260.0000	150.0000	41.593
Antimony	mg/L	0.0014	0.00085	0.0016	0.0028	0.0039	0.00071	0.00147	0.00280	0.00071	0.00083
Arsenic	mg/L	0.0009	0.0025	0.00091	0.0012	0.0021	0.0013	0.00136	0.00250	0.00090	0.00066
Barium	mg/L	0.094	0.079	0.081	0.058	0.14	0.078	0.07800	0.09400	0.05800	0.01290
Beryllium	mg/L	*0.00025*	*0.000037*	*0.00011*	*0.000037*	0.000076	*0.000037*	0.00009	0.00025	0.00004	0.00009
Bis (2-ethylhexyl) phthalate	mg/L	0.023	0.012	*0.000325*	0.0075	0.038	0.0026	0.00909	0.02300	0.00033	0.00899
Boron	mg/L	0.79	0.3	0.59	0.53	0.27	0.24	0.49000	0.79000	0.24000	0.22372
Cadmium	mg/L	0.00064	0.000094	*0.000022*	0.00014	0.00056	0.00012	0.00020	0.00064	0.00002	0.00025
Chromium	mg/L	0.0024	0.026	0.005	0.0021	0.0078	0.0036	0.00782	0.02600	0.00210	0.01023
cis-1,2-Dichloroethylene	mg/L	*0.00031*	*0.00031*	*0.00031*	*0.00031*	*0.00031*	*0.00031*	0.00031	0.00031	0.00031	0.00000
Copper	mg/L	0.04	0.11	0.043	0.047	0.1	0.042	0.05640	0.11000	0.04000	0.03007
Cyanide	mg/L	*0.00195*	0.0076	*0.00195*	0.0042	*0.00195*	0.0048	0.00410	0.00760	0.00195	0.00234
Fluoride	mg/L	1.6	0.59	0.63	1	0.62	0.55	0.87400	1.60000	0.55000	0.44388
Iron	mg/L	1.1	8.1	0.54	0.59	4.2	0.95	2.25600	8.10000	0.54000	3.27546
Lead	mg/L	*0.00135*	*0.00135*	*0.00135*	*0.00135*	*0.00135*	*0.00135*	0.00135	0.00135	0.00135	0.00000
Mercury	mg/L	0.000019	0.0000358	0.00000547	0.0000144	0.000111	0.0000374	0.0000224	0.0000374	0.0000055	0.0000138
Molybdenum	mg/L	0.0025	0.0039	0.0048	0.0039	0.0041	0.002	0.00342	0.00480	0.00200	0.00114
Nickel	mg/L	*0.0026*	0.01	*0.0026*	*0.0026*	0.013	*0.0026*	0.00408	0.01000	0.00260	0.00331
Oil and Grease	mg/L	52.2	20.3	37.1	36.4	34.9	32.1	35.62000	52.20000	20.30000	11.45413
Selenium	mg/L	0.001	0.00081	0.0015	0.00096	0.0019	0.00093	0.00104	0.00150	0.00081	0.00027
Silver	mg/L	0.00043	0.0001	0.00023	0.00014	0.00092	0.00015	0.00021	0.00043	0.00010	0.00013
Styrene	mg/L	*0.000245*	*0.000245*	*0.000245*	*0.000245*	*0.000245*	*0.000245*	0.00025	0.00025	0.00025	0.00000
Thallium	mg/L	*0.0000405*	*0.0000065*	*0.0000405*	0.000018	0.00003	*0.0000065*	0.00002	0.00004	0.00001	0.00002
Xylenes (total)	mg/L	*0.000495*	*0.000495*	*0.000495*	*0.000495*	*0.000495*	*0.000495*	0.00050	0.00050	0.00050	0.00000
Zinc	mg/L	0.16	0.092	0.18	0.12	0.58	0.12	0.13440	0.18000	0.09200	0.03517

Abbreviations:

mg/L - milligrams per liter.

Notes:

Values in italics were nondetect and are reported at half the detection limit, or half the reporting limit if the detection limit is unavailable

A light orange cell indicates data points that are not used

Table D6. Domestic and Commercial Background Data Summary
Industrial Pretreatment Program: Local Limits Evaluation
City of Tolleson, AZ

Parameter	Units	Collection System Location								Average	Maximum	Minumum	Standard Deviation
		Patricia Ct.	95th Ave	Tollesons Meadows	95th Ave #2	Tollesons Meadows #2	James Sherwood & Stanley Goff	Villa Rica	Tolleson Meadows #3				
Biochemical Oxygen Demand (BOD)	mg/L	200	310	420	400	130	220	290	330	287.5000	420.0000	130.0000	99.678
Suspended Solids, Total (TSS)	mg/L	280	170	130	230	96	55	84	180	153.1250	280.0000	55.0000	76.736

Abbreviations:

mg/L - milligrams per liter.

Appendix E: MAHL and MAIL Calculations

Table E1. Maximum Allowable Headworks Loading Analysis for City of Tolleson Wastewater Treatment Plant

Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

WWTP Name:	City of Tolleson Wastewater Treatment Plant
Date:	
Average WWTP Flow (mgd):	5.73
Total Actual Industrial Flow (mgd):	1.05
Septic/Hauled Waste Flow (mgd):	0.00
Domestic/Commercial Flow (mgd):	4.68
Sludge Flow to Digester (mgd):	0.02
Dry Sludge to Disposal (metric tons/day):	2.03
AZPDES Permit Number:	AZ0020338
AZPDES Permitted Discharge (mgd):	17.5
Receiving Stream:	Salt River (From City of Phoenix - 23rd Ave WWTP outfall to confluence with Gila River), Middle Gila River Basin
Stream Flow (mgd)[a]:	0
Stream Classification:	Aquatic and Wildlife effluent dependent water (A&Wedw), Partial Body Contact (PBC), Fish Consumption (FC), Agricultural Irrigation (AgI), Agricultural Livestock watering
Safety (10) and Growth Factor (0)(%)[b]:	10

[a] Receiving stream is ephemeral prior to discharge.

[b] Safety factor for BOD and TSS is 5%.

Table E2. Local Limits Determination Based on Design Criteria for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Septic/Hauled Waste Conc. (mg/L) (C_{HW})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Domestic & Commercial Bkgd Conc. (mg/L) (C_{UNC})	Design Criteria (lb/day) (L_{DC})	Allowable Headworks Loading (lb/day) (AHL_{DESIGN})	Domestic & Commercial Loading (lb/day) (L_{UNC})	Allowable Industrial Loading (lb/day) (AIL_{DESIGN})	Industrial Local Limit (mg/L) ($C_{LIM\text{-}DESIGN}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.1	5.7	0		4.7	35.000	2,889	2889	1,365	1,235	140	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	0		4.7	287.50	40,650	40650	11,210	27,407	3116	5
Suspended Solids, Total (TSS)	1.1	5.7	0		4.7	153.13	29,633	29633	5,971	22,181	2522	5
Antimony	1.1	5.7	0		4.7	0.0015		----	0.057	-----	-----	10
Arsenic	1.1	5.7	0		4.7	0.0014		----	0.053	-----	-----	10
Barium	1.1	5.7	0		4.7	0.0780		----	3.041	-----	-----	10
Beryllium	1.1	5.7	0		4.7	0.0001		----	0.004	-----	-----	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	0		4.7	0.0091		----	0.354	-----	-----	10
Boron	1.1	5.7	0		4.7	0.4900		----	19.106	-----	-----	10
Cadmium	1.1	5.7	0		4.7	0.0002		----	0.008	-----	-----	10
Chromium	1.1	5.7	0		4.7	0.0078		----	0.305	-----	-----	10
Copper	1.1	5.7	0		4.7	0.0564		----	2.199	-----	-----	10
Cyanide	1.1	5.7	0		4.7	0.0041		----	0.160	-----	-----	10
Fluoride	1.1	5.7	0		4.7	0.8740		----	34.079	-----	-----	10
Iron	1.1	5.7	0		4.7	2.2560		----	87.965	-----	-----	10
Lead	1.1	5.7	0		4.7	0.0014		----	0.053	-----	-----	10
Mercury	1.1	5.7	0		4.7	0.0000		----	0.001	-----	-----	10
Molybdenum	1.1	5.7	0		4.7	0.0034		----	0.133	-----	-----	10
Nickel	1.1	5.7	0		4.7	0.0041		----	0.159	-----	-----	10
Oil and Grease	1.1	5.7	0		4.7	35.620		----	1,388.882	-----	-----	10
Selenium	1.1	5.7	0		4.7	0.0010		----	0.041	-----	-----	10
Silver	1.1	5.7	0		4.7	0.0002		----	0.008	-----	-----	10
Thallium	1.1	5.7	0		4.7	0.0000		----	0.001	-----	-----	10
Zinc	1.1	5.7	0		4.7	0.1344		----	5.240	-----	-----	10

(Q_{IND})	Industrial flow in mgd.	(L_{UNC})	Domestic/commercial loading in lb/day.
(Q_{WWTP})	WWTP's average flow in mgd.	(L_{HW})	Septic/hauled waste loading in lb/day.
(Q_{DOM})	Domestic/commercial background flow in mgd.	(AIL_{DESIGN})	Allowable industrial loading to the WWTP in lb/day.
(Q_{HW})	Septic/hauled waste flow in mgd.	($C_{LIM\text{-}DESIGN}$)	Local limits for industrial users in mg/L.
(C_{DOM})	Domestic/commercial background concentrations in mg/L.	(SGF)	Safety and growth factor as a percent.
(C_{HW})	Septic/hauled waste concentrations in mg/L.	8.34	Unit conversion factor.
(L_{DC})	The pollutant loading the WWTP is designed to treat in lb/day.		

Table E3. Local Limits Determination Based on Permit Limits for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	WWTP Permitted Flow (mgd) (Q_{NPDES})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Average Influent Pollutant Conc.[a] (mg/L) (C_{INFL})	Domestic & Commercial Bkgd Conc.[a] (mg/L) (C_{UNC})	Septic/Hauled Waste Conc.[a,b] (mg/L) (C_{HW})	Removal Efficiency[a] (%) (R_{WWTP})	Permit Limit for Discharge (mg/L) (C_{NPDES})	Allowable Headworks Loading (lb/day) (AHL_{NPDES})	Domestic & Commercial Loading (lb/day) (L_{UNC})	Septic/Hauled Waste Loading (lb/day) (L_{HW})	Allowable Industrial Loading (lb/day) (AIL_{NPDES})	Industrial Local Limit (mg/L) ($C_{LIM-NPDES}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.05	5.7	17.5	4.68	0	34.8	35.000		96.9%		-----	1,364.7075	0	-----	-	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	17.5	4.7	0	829.9	287.500		98.4%	30	91555.6	11,210.0975	0	75767.7599	8613.3432	5
Suspended Solids, Total (TSS)	1.1	5.7	17.5	4.7	0	483.6	153.125		97.1%	30	49431.8	5,970.5954	0	40989.6186	4659.7346	5
Antimony	1.1	5.7	17.5	4.7	0	0.0019	0.001		70.8%	0.006	0.9831	0.0574	0	0.8274	0.0941	10
Arsenic	1.1	5.7	17.5	4.7	0	0.0031	0.001		14.6%	0.050	2.7983	0.0531	0	2.4653	0.2803	10
Barium	1.1	5.7	17.5	4.7	0	0.1150	0.078		61.1%	2.000	245.8115	3.0413	0	218.1890	24.8039	10
Beryllium	1.1	5.7	17.5	4.7	0	0.0004	0.0001		9.69%	0.004	0.2117	0.0037	0	0.1868	0.0212	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	17.5	4.7	0	0.0054	0.009		86.6%	0.003	1.0734	0.3542	0	0.6118	0.0696	10
Boron	1.1	5.7	17.5	4.7	0	0.4133	0.490		8.58%	1	52.2749	19.1059	0	27.9415	3.1764	10
Cadmium	1.1	5.7	17.5	4.7	0	0.0002	0.000		88.3%	0.005	2.0481	0.0079	0	1.8353	0.2086	10
Chromium	1.1	5.7	17.5	4.7	0	0.0108	0.008		59.9%	0.100	11.9185	0.3049	0	10.4217	1.1847	10
Copper	1.1	5.7	17.5	4.7	0	0.0896	0.056		92.2%	0.019	11.6637	2.1991	0	8.2982	0.9434	10
Cyanide	1.1	5.7	17.5	4.7	0	0.0050	0.004		0%	0.008	0.3827	0.1599	0	0.1846	0.0210	10
Fluoride	1.1	5.7	17.5	4.7	0	4.8700	0.874		86.5%	4	1413.5356	34.0787	0	1238.1033	140.7486	10
Iron	1.1	5.7	17.5	4.7	0	1.6571	2.256		84.5%	0.819	252.2261	87.9651	0	139.0384	15.8060	10
Lead	1.1	5.7	17.5	4.7	0	0.0075	0.001		55.0%	0.050	5.3098	0.0526	0	4.7262	0.5373	10
Mercury	1.1	5.7	17.5	4.7	0	0.000008	0.00002		41.9%	0.00001	0.0008	0.0009	0	-0.0001	0.0000	10
Molybdenum	1.1	5.7	17.5	4.7	0	0.0391	0.003		63.1%		-----	0.1334	0	-----	-	10
Nickel	1.1	5.7	17.5	4.7	0	0.0057	0.004		29.0%	0.100	6.7307	0.1591	0	5.8986	0.6706	10
Oil and Grease	1.1	5.7	17.5	4.7	0	56.2385	35.620		95.3%	10	10106.9687	1,388.8823	0	7707.3894	876.1826	10
Selenium	1.1	5.7	17.5	4.7	0	0.0023	0.001		66.6%	0.002	0.2862	0.0406	0	0.2171	0.0247	10
Silver	1.1	5.7	17.5	4.7	0	0.0001	0.000		46.5%		-----	0.0082	0	-----	-	10
Thallium	1.1	5.7	17.5	4.7	0	0.00001	0.000		56.5%	0.002	0.2196	0.0009	0	0.1967	0.0224	10
Zinc	1.1	5.7	17.5	4.7	0	0.2795	0.134		89.6%		-----	5.2405	0	-----	-	10

[a] Pollutant concentrations in italics are non-detect (reported as 1/2 reporting limit). Values in red are literature values.

[b] Values in red are literature values from Appendix L from the USEPA Local Limits Development Guidance Document Appendices.

(Q_{IND})	Industrial flow in mgd.	(R_{WWTP})	Removal efficiency across WWTP as a percent.	(SGF)	Safety and growth factor as a percent.
(Q_{WWTP})	WWTP's average flow in mgd.	(C_{NPDES})	NPDES monthly average permit limit in mg/L.	8.34	Unit conversion factor.
(Q_{DOM})	Domestic/commercial background flow in mgd.	(AHL_{NPDES})	Allowable headworks pollutant loading to the WWTP in lb/day.	(Q_{NPDES})	WWTP's permitted flow in mgd.
(Q_{HW})	Septic/hauled waste flow in mgd.	(L_{UNC})	Domestic/commercial loading in lb/day.		
(C_{DOM})	Domestic/commercial background concentrations in mg/L.	(L_{HW})	Septic/hauled waste loading in lb/day.		
(C_{HW})	Septic/hauled waste concentrations in mg/L.	(AIL_{NPDES})	Allowable industrial loading to the WRF in lb/day.		
(C_{INFL})	Influent pollutant conconcentration in mg/L.	($C_{LIM-NPDES}$)	Local limits for industrial users in mg/L.		

Table E4. Local Limits Determination Based on Trickling Filter Inhibition Threshold Levels for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Domestic & Commercial Bkgd Conc.[a] (mg/L) (C_{UNC})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Septic/Hauled Waste Conc.[a] (mg/L) (C_{HW})	Removal Efficiency[a] (%) (R_{PRIM})	Trickling Filter Inhibition Level (mg/L) (C_{INHIB1})	Allowable Headworks Loading (lb/day) (AHL_{INHIB1})	Domestic & Commercial Loading (lb/day) (L_{UNC})	Septic/Hauled Waste Loading (lb/day) (L_{HW})	Allowable Industrial Loading (lb/day) (AIL_{INHIB1})	Industrial Local Limit (mg/L) ($C_{LIM\text{-}INHIB1}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.1	5.7	4.7	35.000	0				-----	1,364.708	0	-----	-----	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	4.7	287.50	0				-----	11,210.098	0	-----	-----	5
Suspended Solids, Total (TSS)	1.1	5.7	4.7	153.13	0				-----	5,970.595	0	-----	-----	5
Antimony	1.1	5.7	4.7	0.0015	0				-----	0.057	0	-----	-----	10
Arsenic	1.1	5.7	4.7	0.0014	0				-----	0.053	0	-----	-----	10
Barium	1.1	5.7	4.7	0.0780	0				-----	3.041	0	-----	-----	10
Beryllium	1.1	5.7	4.7	0.0001	0				-----	0.004	0	-----	-----	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	4.7	0.0091	0				-----	0.354	0	-----	-----	10
Boron	1.1	5.7	4.7	0.4900	0				-----	19.106	0	-----	-----	10
Cadmium	1.1	5.7	4.7	0.0002	0		15		-----	0.008	0	-----	-----	10
Chromium	1.1	5.7	4.7	0.0078	0		27		-----	0.305	0	-----	-----	10
Copper	1.1	5.7	4.7	0.0564	0		22		-----	2.199	0	-----	-----	10
Cyanide	1.1	5.7	4.7	0.0041	0		27	30	1,964	0.160	0	1,767	201	10
Fluoride	1.1	5.7	4.7	0.8740	0				-----	34.079	0	-----	-----	10
Iron	1.1	5.7	4.7	2.2560	0				-----	87.965	0	-----	-----	10
Lead	1.1	5.7	4.7	0.0014	0		57		-----	0.053	0	-----	-----	10
Mercury	1.1	5.7	4.7	0.0000	0		10		-----	0.001	0	-----	-----	10
Molybdenum	1.1	5.7	4.7	0.0034	0				-----	0.133	0	-----	-----	10
Nickel	1.1	5.7	4.7	0.0041	0		14		-----	0.159	0	-----	-----	10
Oil and Grease	1.1	5.7	4.7	35.620	0				-----	1,388.882	0	-----	-----	10
Selenium	1.1	5.7	4.7	0.0010	0				-----	0.041	0	-----	-----	10
Silver	1.1	5.7	4.7	0.0002	0		20		-----	0.008	0	-----	-----	10
Thallium	1.1	5.7	4.7	0.0000	0				-----	0.001	0	-----	-----	10
Zinc	1.1	5.7	4.7	0.1344	0		27		-----	5.240	0	-----	-----	10

[a] Pollutant concentrations in italics are non-detect (reported as 1/2 reporting limit). Values in red are literature values.

(Q_{IND})	Industrial flow in mgd.	(AHL_{INHIB1})	Allowable headworks pollutant loading f
(Q_{WWTP})	WWTP's average flow in mgd.	(L_{UNC})	Domestic/commercial loading in lb/day.
(Q_{DOM})	Domestic/commercial background flow in mgd.	(L_{HW})	Septic/hauled waste loading in lb/day.
(Q_{HW})	Septic/hauled waste flow in mgd.	(AIL_{INHIB1})	Allowable industrial loading to the WWTP in lb/day.
(C_{DOM})	Domestic/commercial background concentrations in mg/L.	($C_{LIM\text{-}INHIB1}$)	Local limits for industrial users in mg/L.
(C_{HW})	Septic/hauled waste concentrations in mg/L.	(SGF)	Safety and growth factor as a percent.
(R_{PRIM})	Removal efficiency after primary treatment as a percent.	8.34	Unit conversion factor.
(C_{INHIB1})	Trickling filter treatment inhibition threshold level for a particular pollutant in mg/L.		

Table E5. Local Limits Determination Based on Nitrification Inhibition Threshold Levels for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Domestic & Commercial Bkgd Conc.[a] (mg/L) (C_{UNC})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Septic/Hauled Waste Conc.[a] (mg/L) (C_{HW})	Removal Efficiency[a] (%) (R_{PRIM})	Nitrification Inhibition Level (mg/L) (C_{INHIB2})	Allowable Headworks Loading (lb/day) (AHL_{INHIB2})	Domestic & Commercial Loading (lb/day) (L_{UNC})	Septic/Hauled Waste Loading (lb/day) (L_{HW})	Allowable Industrial Loading (lb/day) (AIL_{INHIB2})	Industrial Local Limit (mg/L) ($C_{LIM\text{-}INHIB2}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.1	5.7	4.7	35.000	0				-----	1,364.7	0	-----	-----	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	4.7	287.50	0				-----	11,210	0	-----	-----	5
Suspended Solids, Total (TSS)	1.1	5.7	4.7	153.13	0				-----	5,970.6	0	-----	-----	5
Antimony	1.1	5.7	4.7	0.0015	0				-----	0.0574	0	-----	-----	10
Arsenic	1.1	5.7	4.7	0.0014	0			1.5	72	0.0531	0	64	7.328	10
Barium	1.1	5.7	4.7	0.0780	0				-----	3.0413	0	-----	-----	10
Beryllium	1.1	5.7	4.7	0.0001	0				-----	0.0037	0	-----	-----	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	4.7	0.0091	0				-----	0.3542	0	-----	-----	10
Boron	1.1	5.7	4.7	0.4900	0				-----	19.106	0	-----	-----	10
Cadmium	1.1	5.7	4.7	0.0002	0		15	5.2	292	0.0079	0	263	29.91	10
Chromium	1.1	5.7	4.7	0.0078	0		27	50.5	3,306	0.3049	0	2,975	338.2	10
Copper	1.1	5.7	4.7	0.0564	0		22	0.265	16	2.1991	0	12	1.411	10
Cyanide	1.1	5.7	4.7	0.0041	0		27	0.42	27	0.1599	0	25	2.795	10
Fluoride	1.1	5.7	4.7	0.8740	0				-----	34.079	0	-----	-----	10
Iron	1.1	5.7	4.7	2.2560	0				-----	87.965	0	-----	-----	10
Lead	1.1	5.7	4.7	0.0014	0		57	0.5	56	0.0526	0	50	5.679	10
Mercury	1.1	5.7	4.7	0.0000	0		10		-----	0.0009	0	-----	-----	10
Molybdenum	1.1	5.7	4.7	0.0034	0				-----	0.1334	0	-----	-----	10
Nickel	1.1	5.7	4.7	0.0041	0		14	0.375	21	0.1591	0	19	2.114	10
Oil and Grease	1.1	5.7	4.7	35.620	0				-----	1,388.9	0	-----	-----	10
Selenium	1.1	5.7	4.7	0.0010	0				-----	0.0406	0	-----	-----	10
Silver	1.1	5.7	4.7	0.0002	0		20		-----	0.0082	0	-----	-----	10
Thallium	1.1	5.7	4.7	0.0000	0				-----	0.0009	0	-----	-----	10
Zinc	1.1	5.7	4.7	0.1344	0		27	0.29	19	5.2405	0	12	1.347	10

[a] Pollutant concentrations in italics are non-detect (reported as 1/2 reporting limit). Values in red are literature values.

(Q_{IND})	Industrial flow in mgd.	(AHL_{INHIB2})	Allowable headworks pollutant loading i
(Q_{WWTP})	WWTP's average flow in mgd.	(L_{UNC})	Domestic/commercial loading in lb/day.
(Q_{DOM})	Domestic/commercial background flow in mgd.	(L_{HW})	Septic/hauled waste loading in lb/day.
(Q_{HW})	Septic/hauled waste flow in mgd.	(AIL_{INHIB2})	Allowable industrial loading to the WWTP in lb/day.
(C_{DOM})	Domestic/commercial background concentrations in mg/L.	($C_{LIM\text{-}INHIB2}$)	Local limits for industrial users in mg/L.
(C_{HW})	Septic/hauled waste concentrations in mg/L.	(SGF)	Safety and growth factor as a percent.
(R_{PRIM})	Removal efficiency after primary treatment as a percent.	8.34	Unit conversion factor.
(C_{INHIB2})	Nitrification inhibition threshold level for a particular pollutant in mg/L.		

Table E6. Local Limits Determination Based on Anaerobic Digestion Inhibition Threshold Levels for City of Tolleson Wastewater Treatment Plant6
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Domestic & Commercial Bkgd Conc.[a] (mg/L) (C_{UNC})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Septic/Hauled Waste Conc.[a] (mg/L) (C_{HW})	Sludge to Digester (MGD) (Q_{DIG})	Removal Efficiency[a] (%) (R_{WWTP})	Anaerobic Digestion Inhibition Level (mg/L) (C_{INHIB3})	Allowable Headworks Loading (lb/day) (AHL_{INHIB3})	Domestic & Commercial Loading (lb/day) (L_{UNC})	Septic/Hauled Waste Loading (lb/day) (L_{HW})	Allowable Industrial Loading (lb/day) (AIL_{INHIB3})	Industrial Local Limit (mg/L) ($C_{LIM-INHIB3}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.1	5.7	4.7	35.000	0		0.02	97%	4750	-----	1,365	0	-----	-----	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	4.7	287.50	0		0.02	98%		-----	11,210	0	-----	-----	5
Suspended Solids, Total (TSS)	1.1	5.7	4.7	153.13	0		0.02	97%		-----	5,971	0	-----	-----	5
Antimony	1.1	5.7	4.7	0.0015	0		0.02	71%		-----	0.057	0	-----	-----	10
Arsenic	1.1	5.7	4.7	0.0014	0		0.02	15%	1.6	2	0.053	0	2	0.181	10
Barium	1.1	5.7	4.7	0.0780	0		0.02	61%		-----	3.041	0	-----	-----	10
Beryllium	1.1	5.7	4.7	0.0001	0		0.02	10%		-----	0.004	0	-----	-----	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	4.7	0.0091	0		0.02	87%		-----	0.354	0	-----	-----	10
Boron	1.1	5.7	4.7	0.4900	0		0.02	9%		-----	19.11	0	-----	-----	10
Cadmium	1.1	5.7	4.7	0.0002	0		0.02	88%	20	4	0.008	0	3	0.385	10
Chromium	1.1	5.7	4.7	0.0078	0		0.02	60%		-----	0.305	0	-----	-----	10
Copper	1.1	5.7	4.7	0.0564	0		0.02	92%	40	7	2.199	0	4	0.490	10
Cyanide	1.1	5.7	4.7	0.0041	0		0.02	0%	50.5	8,423	0.160	0	7,581	861.8	10
Fluoride	1.1	5.7	4.7	0.8740	0		0.02	86%		-----	34.08	0	-----	-----	10
Iron	1.1	5.7	4.7	2.2560	0		0.02	84%		-----	87.97	0	-----	-----	10
Lead	1.1	5.7	4.7	0.0014	0		0.02	55%	340	103	0.053	0	93	10.54	10
Mercury	1.1	5.7	4.7	0.0000	0		0.02	42%		-----	0.001	0	-----	-----	10
Molybdenum	1.1	5.7	4.7	0.0034	0		0.02	63%		-----	0.133	0	-----	-----	10
Nickel	1.1	5.7	4.7	0.0041	0		0.02	29%	73	42	0.159	0	38	4.278	10
Oil and Grease	1.1	5.7	4.7	35.620	0		0.02	95%		-----	1,389	0	-----	-----	10
Selenium	1.1	5.7	4.7	0.0010	0		0.02	67%		-----	0.041	0	-----	-----	10
Silver	1.1	5.7	4.7	0.0002	0		0.02	47%	39	14	0.008	0	13	1.429	10
Thallium	1.1	5.7	4.7	0.0000	0		0.02	56%		-----	0.001	0	-----	-----	10
Zinc	1.1	5.7	4.7	0.1344	0		0.02	90%	400	74	5.240	0	62	7.023	10

[a] Pollutant concentrations in italics are non-detect (reported as 1/2 reporting limit). Values in red are literature values.

(Q_{IND})	Industrial flow in mgd.	(AHL_{INHIB3})	Allowable headworks pollutant loading to the WWTP in lb/da
(Q_{WWTP})	WWTP's average flow in mgd.	(L_{UNC})	Domestic/commercial loading in lb/day.
(Q_{DOM})	Domestic/commercial background flow in mgd.	(L_{HW})	Septic/hauled waste loading in lb/day.
(Q_{HW})	Septic/hauled waste flow in mgd.	(AIL_{INHIB3})	Allowable industrial loading to the WWTP in lb/day.
(C_{DOM})	Domestic/commercial background concentrations in mg/L.	($C_{LIM-INHIB3}$)	Local limits for industrial users in mg/L.
(C_{HW})	Septic/hauled waste concentrations in mg/L.	(SGF)	Safety and growth factor as a percent.
(R_{WWTP})	Removal efficiency across WWTP as a percent.	8.34	Unit conversion factor.
(C_{INHIB3})	Anaerobic digestion inhibition threshold level for a particular pollutant in mg/L.		

Table E7. Local Limits Determination Based on Sludge Disposal for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Domestic & Commercial Bkgd Conc.[a] (mg/L) (C_{UNC})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Septic/Hauled Waste Conc.[a] (mg/L) (C_{HW})	Sludge to Disposal (dry metric tons/day) (Q_{SLUDGE})	Removal Efficiency[a] (%) (R_{WWTP})	Sludge Criteria (mg/kg) (C_{SLUDGE})	Allowable Headworks Loading (lbs/day) (AHL_{SLUDGE})	Domestic & Commercial Loading (lbs/day) (L_{UNC})	Septic/Hauled Waste Loading (lbs/day) (L_{HW})	Allowable Industrial Loading (lbs/day) (AIL_{SLUDGE})	Industrial Local Limit (mg/L) ($C_{LIM\text{-}SLUDGE}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.1	5.7	4.7	35.00	0		2.0	96.9%		-----	1,364.708	0	-----	-----	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	4.7	287.5	0		2.0	98.4%		-----	11,210.098	0	-----	-----	5
Suspended Solids, Total (TSS)	1.1	5.7	4.7	153.1	0		2.0	97.1%		-----	5,970.595	0	-----	-----	5
Antimony	1.1	5.7	4.7	0.001	0		2.0	70.8%		-----	0.057	0	-----	-----	10
Arsenic	1.1	5.7	4.7	0.001	0		2.0	14.6%	41	1.25	0.053	0	1.075	0.122	10
Barium	1.1	5.7	4.7	0.078	0		2.0	61.1%		-----	3.041	0	-----	-----	10
Beryllium	1.1	5.7	4.7	0.000	0		2.0	9.69%		-----	0.004	0	-----	-----	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	4.7	0.009	0		2.0	86.6%		-----	0.354	0	-----	-----	10
Boron	1.1	5.7	4.7	0.490	0		2.0	8.58%		-----	19.106	0	-----	-----	10
Cadmium	1.1	5.7	4.7	0.000	0		2.0	88.3%	39	0.20	0.008	0	0.170	0.019	10
Chromium	1.1	5.7	4.7	0.008	0		2.0	59.9%	3000	22.37	0.305	0	19.824	2.254	10
Copper	1.1	5.7	4.7	0.056	0		2.0	92.2%	1500	7.26	2.199	0	4.339	0.493	10
Cyanide	1.1	5.7	4.7	0.004	0		2.0	0.10%		-----	0.160	0	-----	-----	10
Fluoride	1.1	5.7	4.7	0.874	0		2.0	86.5%		-----	34.079	0	-----	-----	10
Iron	1.1	5.7	4.7	2.256	0		2.0	84.5%		-----	87.965	0	-----	-----	10
Lead	1.1	5.7	4.7	0.0014	0		2.0	55.0%	300	2.44	0.053	0	2.140	0.243	10
Mercury	1.1	5.7	4.7	*0.000*	0		2.0	41.9%	17	0.18	0.001	0	0.162	0.018	10
Molybdenum	1.1	5.7	4.7	0.003	0		2.0	63.1%	75	0.53	0.133	0	0.344	0.039	10
Nickel	1.1	5.7	4.7	0.004	0		2.0	29.0%	420	6.47	0.159	0	5.662	0.644	10
Oil and Grease	1.1	5.7	4.7	*35.62*	0		2.0			-----	1,388.882	0	-----	-----	10
Selenium	1.1	5.7	4.7	0.00104	0		2.0	66.6%	100	0.67	0.041	0	0.563	0.064	10
Silver	1.1	5.7	4.7	0.0002	0		2.0	46.5%		-----	0.008	0	-----	-----	10
Thallium	1.1	5.7	4.7	0.00002	0		2.0			-----	0.001	0	-----	-----	10
Zinc	1.1	5.7	4.7	0.134	0		2.0	89.6%	2800	13.96	5.240	0	7.320	0.832	10

[a] Polluant concentrations in italics are non-detect (reported as 1/2 reporting limit).

(Q_{IND})	Industrial flow in mgd.	(Q_{SLUDGE})	Dry sludge to disposal in dry metric tons per day.
(Q_{WWTP})	WWTP's average flow in mgd.	(AHL_{SLUDGE})	Allowable headworks pollutant loading to the WWTP in lbs/day.
(Q_{DOM})	Domestic/commercial background flow in mgd.	(L_{UNC})	Domestic/commercial loading in lbs/day.
(Q_{HW})	Septic/hauled waste flow in mgd.	(L_{HW})	Septic/hauled waste loading in lbs/day.
(C_{DOM})	Domestic/commercial background concentrations in mg/L.	(AIL_{SLUDGE})	Allowable industrial loading to the WWTP in lbs/day.
(C_{HW})	Septic/hauled waste concentrations in mg/L.	($C_{LIM\text{-}SLUDGE}$)	Local limits for industrial users in mg/L.
(R_{WWTP})	Removal efficiency across WWTP as a percent.	(SGF)	Safety and growth factor as a percent.
(C_{SLUDGE})	Sludge criteria for a particular pollutant in mg/kg.	8.34	Unit conversion factor.

Table E8. Local Limits Determination Based on Water Quality Standards for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	IU Flow (mgd) (Q_{IND})	WWTP Flow (mgd) (Q_{WWTP})	Domestic & Commercial Flow (mgd) (Q_{UNC})	Domestic & Commercial Bkgd Conc. (mg/L) (C_{UNC})	Septic/Hauled Waste Flow (mgd) (Q_{HW})	Septic/Hauled Waste Conc. (mg/L) (C_{HW})	Removal Efficiency (%) (R_{WWTP})	Stream Flow (mgd) (Q_{STR})	Upstream Conc. (mg/L) (C_{STR})	WQS (mg/L) (C_{WQS})	Allowable Headworks Loa (AHL_{WQS})	Domestic & Commercial Loading (lb/day) (L_{UNC})	Septic/Hauled Waste Loading (lb/day) (L_{HW})	Allowable Industrial Loading (lb/day) (AIL_{WQS})	Industrial Local Limit (mg/L) ($C_{LIM-WQS}$)	Safety and Growth Factor (%) (SGF)
Ammonia (as N)	1.1	5.7	4.7	35.0	0		97%	0		2.227	3,380	1,364.708	0	1,677.581	190.709	10
Biochemical Oxygen Demand (BOD)	1.1	5.7	4.7	287.5	0		98%	0		-	-----	11,210.098	0	-----	-----	5
Suspended Solids, Total (TSS)	1.1	5.7	4.7	153.1	0		97%	0		-	-----	5,970.595	0	-----	-----	5
Antimony	1.1	5.7	4.7	0.0	0		71%	0		0.600	98	0.057	0	88.419	10.052	10
Arsenic	1.1	5.7	4.7	0.0	0		15%	0		0.080	4	0.053	0	3.976	0.452	10
Barium	1.1	5.7	4.7	0.1	0		61%	0		98.000	12,045	3.041	0	10,837.246	1,231.987	10
Beryllium	1.1	5.7	4.7	0.0	0		10%	0		0.005	0	0.004	0	0.249	0.028	10
Bis (2-ethylhexyl) phthalate	1.1	5.7	4.7	0.0	0		87%	0		0.003	1	0.354	0	0.612	0.070	10
Boron	1.1	5.7	4.7	0.5	0		9%	0		1.000	52	19.106	0	27.942	3.176	10
Cadmium	1.1	5.7	4.7	0.0	0		88%	0		0.002	1	0.008	0	0.582	0.066	10
Chromium	1.1	5.7	4.7	0.0	0		60%	0		1.000	119	0.305	0	106.961	12.159	10
Copper	1.1	5.7	4.7	0.1	0		92%	0		0.023	14	2.199	0	10.287	1.169	10
Cyanide	1.1	5.7	4.7	0.0	0		0%	0		0.010	0	0.160	0	0.258	0.029	10
Fluoride	1.1	5.7	4.7	0.9	0		86%	0		140.000	49,474	34.079	0	44,492.292	5,057.921	10
Iron	1.1	5.7	4.7	2.3	0		84%	0		1.000	308	87.965	0	189.206	21.509	10
Lead	1.1	5.7	4.7	0.0	0		55%	0		0.008	1	0.053	0	0.712	0.081	10
Mercury	1.1	5.7	4.7	0.0	0		42%	0		0.000	0	0.001	0	-0.00013	-0.00002	10
Molybdenum	1.1	5.7	4.7	0.0	0		63%	0		-	-----	0.133	0	-----	-----	10
Nickel	1.1	5.7	4.7	0.0	0		29%	0		0.130	9	0.159	0	7.728	0.879	10
Oil and Grease	1.1	5.7	4.7	35.6	0		95%	0		-	-----	1,388.882	0	-----	-----	10
Selenium	1.1	5.7	4.7	0.0	0		67%	0		0.002	0	0.041	0	0.217	0.025	10
Silver	1.1	5.7	4.7	0.0	0		47%	0		0.021	2	0.008	0	1.665	0.189	10
Thallium	1.1	5.7	4.7	0.0	0		56%	0		0.007	1	0.001	0	0.711	0.081	10
Zinc	1.1	5.7	4.7	0.1	0		90%	0		0.294	135	5.240	0	116.328	13.224	10

(Q_{IND}) Industrial flow in mgd.
(Q_{WWTP}) WWTP's average flow in mgd.
(Q_{DOM}) Domestic/commercial background flow in mgd.
(Q_{HW}) Septic/hauled waste flow in mgd.
(C_{DOM}) Domestic/commercial background concentrations in mg/L.
(C_{HW}) Septic/hauled waste concentrations in mg/L.
(Q_{STR}) Receiving stream flow in mgd.
(R_{WWTP}) Removal efficiency across WWTP as a percent.
(C_{STR}) Receiving stream background level, where available, in mg/L.

(C_{WQS}) Water quality standard for a particular pollutant in mg/L.
(AHL_{WQS}) Allowable headworks pollutant loading to the WWTP in lb/day.
(L_{UNC}) Domestic/commercial loading in lb/day.
(L_{HW}) Septic/hauled waste loading in lb/day.
(AIL_{WQS}) Allowable industrial loading to the WWTP in lb/day.
($C_{LIM-WQS}$) Local limits for industrial users in mg/L.
(SGF) Safety and growth factor as a percent.
8.34 Unit conversion factor.

Table E9. Summary of Allowable Headworks Loadings (AHLs) for City of Tolleson Wastewater Treatment Plan
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	Allowable Headworks Loadings (lb/day)						
	Design Criteria (AHL_{DC})	Discharge Permit Limits (AHL_{NPDES})	Trickling Filter Treatment Inhibition (AHL_{INHIB1})	Nitrification Inhibition (AHL_{INHIB2})	Anaerobic Digestion Inhibition (AHL_{INHIB3})	Sludge Disposal (AHL_{SLUDGE})	Water Quality Standards (AHL_{WQS})
Ammonia (as N)	2,889	-----	-----	-----	-----	-----	3,380
Biochemical Oxygen Demand (BOD)	40,650	91,556	-----	-----	-----	-----	-----
Suspended Solids, Total (TSS)	29,633	49,432	-----	-----	-----	-----	-----
Antimony	----	0.983	-----	-----	-----	-----	98.3
Arsenic	----	2.798	-----	71.68	1.827	1.253	4.477
Barium	----	245.8	-----	-----	-----	-----	12,045
Beryllium	----	0.212	-----	-----	-----	-----	0.280
Bis (2-ethylhexyl) phthalate	----	1.073	-----	-----	-----	-----	1.073
Boron	----	52.27	-----	-----	-----	-----	52.27
Cadmium	----	2.048	-----	292.4	3.777	0.197	0.655
Chromium	----	11.92	-----	3,306	-----	22.37	119.2
Copper	----	11.66	-----	16.24	7.235	7.265	13.87
Cyanide	----	0.383	1,964	27.49	8,423	-----	0.464
Fluoride	----	1,414	-----	-----	-----	-----	49,474
Iron	----	252.2	-----	-----	-----	-----	308.0
Lead	----	5.310	-----	55.57	103.1	2.436	0.850
Mercury	----	0.001	-----	-----	-----	0.181	0.001
Molybdenum	----	-----	-----	-----	-----	0.530	-----
Nickel	----	6.731	-----	20.84	41.99	6.468	8.763
Oil and Grease	----	10,107	-----	-----	-----	-----	-----
Selenium	----	0.286	-----	-----	-----	0.670	0.286
Silver	----	-----	-----	-----	13.98	-----	1.859
Thallium	----	0.220	-----	-----	-----	-----	0.790
Zinc	----	-----	-----	18.98	74.46	13.96	135.1

Table E10. Summary of Allowable Industrial Loadings (AILs) for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	Allowable Industrial Loadings (lb/day)						
	Design Criteria	Discharge Permit Limits	Trickling Filter Treatment Inhibition	Nitrification Inhibition	Anaerobic Digestion Inhibition	Sludge Disposal	Water Quality Standards
	(AIL_{DC})	(AIL_{NPDES})	($AIL_{SINHIB1}$)	(AIL_{INHIB2})	(AIL_{INHIB3})	(AIL_{SLUDGE})	(AHL_{WQS})
Ammonia (as N)	1,235	-----	-----	-----	-----	-----	1,678
Biochemical Oxygen Demand (BOD)	27,407	75,768	-----	-----	-----	-----	-----
Suspended Solids, Total (TSS)	22,181	40,990	-----	-----	-----	-----	-----
Antimony	-----	0.827	-----	-----	-----	-----	88.419
Arsenic	-----	2.465	-----	64.461	1.591	1.075	3.976
Barium	-----	218	-----	-----	-----	-----	10,837
Beryllium	-----	0.187	-----	-----	-----	-----	0.249
Bis (2-ethylhexyl) phthalate	-----	0.612	-----	-----	-----	-----	0.612
Boron	-----	27.942	-----	-----	-----	-----	27.942
Cadmium	-----	1.835	-----	263	3.391	0.170	0.582
Chromium	-----	10.422	-----	2,975	-----	19.824	107
Copper	-----	8.298	-----	12.413	4.313	4.339	10.287
Cyanide	-----	0.185	1,767	24.585	7,581	-----	0.2577
Fluoride	-----	1,238	-----	-----	-----	-----	44,492
Iron	-----	139	-----	-----	-----	-----	189
Lead	-----	4.726	-----	49.958	92.749	2.140	0.712
Mercury	-----	-0.00013	-----	-----	-----	0.162	0.000
Molybdenum	-----	-----	-----	-----	-----	0.344	-----
Nickel	-----	5.899	-----	18.595	37.630	5.662	7.728
Oil and Grease	-----	7,707	-----	-----	-----	-----	-----
Selenium	-----	0.217	-----	-----	-----	0.563	0.217
Silver	-----	-----	-----	-----	12.573	-----	1.665
Thallium	-----	0.197	-----	-----	-----	-----	0.711
Zinc	-----	-----	-----	11.845	61.776	7.320	116

Table E11. Maximum Allowable Headworks Loadings and Local Limits for City of Tolleson Wastewater Treatment Plant
Industrial Pretreatment Program: Local Limits Evaluation
Tolleson, AZ

Pollutant	Most Stringent Criterion	Maximum Allowable Headworks Loadings			Maximum Allowable Industrial Loadings		Local Limit Calculation Needed?	Calculated Industrial Local Limit (mg/L)	Worker Protection Screening Level[a] (mg/L)	Domestic/ Commercial Background Levels (mg/L)	Existing Local Limits (mg/L)	Calculated Industrial Local Limit (mg/L)
		Calculated MAHL (lbs/day)	Average Influent Loading (lb/day)	Percent of MAHL Currently in Use (%)	Calculated MAIL (lbs/day)	Existing MAIL (lbs/day)						
Ammonia (as N)	Design Criteria	2,889	1,663	57.55%	1,235	-----	yes	140.440	-----	35.0	30[c]	140.440
Biochemical Oxygen Demand (BOD)[e]	Design Criteria	40,650	39,657	97.56%	27,407	5,555[b]	no		-----	287.5	500[d]	
*Alternative daily maximum BOD MAIL calculations based upon adjusted Design Criteria		55,813	39,657	71.05%	41,812	5,555[b]	no		-----	287.5	500[d]	
Suspended Solids, Total (TSS)	Design Criteria	29,633	23,111	77.99%	22,181	17200[b]	no		-----	153.1	500[d]	
Antimony	Permit Limits	0.9831	0.0901	9.17%	0.827	-----	no		-----	0.0015	-----	
Arsenic	Sludge Disposal	1.2532	0.1484	11.85%	1.075	0.412	yes	0.122	-----	0.0014	0.04	0.122
Barium	Permit Limits	245.8115	5.4956	2.24%	218.189	-----	no		-----	0.0780	-----	
Beryllium	Permit Limits	0.2117	0.0212	9.99%	0.187	-----	no		-----	0.0001	-----	
Bis (2-ethylhexyl) phthalate	Permit Limits	1.0734	0.2571	23.95%	0.612	0.477	yes	0.070	-----	0.0091	0.04	0.070
Boron	Permit Limits	52.2749	19.7525	37.79%	27.942	39.8	yes	3.176	-----	0.4900	3.5	3.176
Cadmium	Sludge Disposal	0.1972	0.0098	4.99%	0.170	0.546	yes	0.019	-----	0.0002	0.05	0.019
Chromium	Permit Limits	11.9185	0.5158	4.33%	10.422	10.3	yes	1.185	-----	0.0078	0.92	1.185
Copper	Anaerobic Digestion Inhibition	7.2352	4.2818	59.18%	4.313	5.35	yes	0.490	-----	0.0564	0.48	0.490
Cyanide	Permit Limits	0.3827	0.2409	62.96%	0.185	0.723	yes	0.021	-----	0.0041	0.06	0.021
Fluoride	Permit Limits	1,413.5356	232.7285	16.46%	1,238.103	-----	no		-----	0.8740	-----	
Iron	Permit Limits	252.2261	79.1919	31.40%	139.038	-----	no		-----	2.2560	-----	
Lead	Water Quality Standards	0.8496	0.3584	42.19%	0.712	3.73	yes	0.081	-----	0.0014	0.33	0.081
Mercury	Permit Limits	0.00082	0.00038	0.46257	-0.00013	[f]	yes	-0.00002	-----	0.00002	0.00020	-0.00002
Molybdenum	Sludge Disposal	0.5305	1.8701	352.55%	0.344	1.55	yes	0.039	-----	0.0034	0.14	0.039
Nickel	Sludge Disposal	6.4680	0.2739	4.23%	5.662	-----	yes	0.644	-----	0.0041		0.644
Oil and Grease	Permit Limits	10,106.9687	2,687.5348	26.59%	7,707.389	-----	yes	876.183	-----	35.6200	100	876.183
Selenium	Permit Limits	0.2862	0.1095	38.27%	0.217	0.036	yes	0.025	-----	0.0010	0.003	0.025
Silver	Water Quality Standards	1.8592	0.0042	0.22%	1.665	1.790	yes	0.189	-----	0.0002	0.16	0.189
Thallium	Permit Limits	0.2196	0.0004	0.19%	0.197	-----	no		-----	0.0000	-----	
Zinc	Sludge Disposal	13.9559	13.3552	95.70%	7.320	22	yes	0.832	-----	0.1344	1.9	0.832

[a] Worker Protection Screening Levels are the most stringent of discharge screening levels based on fume toxicity and explosivity. Refer to Table B9.

[b] Previous MAILs listed for BOD and TSS are the unallocated capacity available at design flow after accounting for industrial commitments from the 2007 local limits study. MAILs for these parameters were not available in the 2010 Local Limits Study Update.

[c] The previous ammonia limit is an alert limit for monitoring.

[d] The previous BOD and TSS limits are a trigger limit for loading evaluation.

[e] The calculated MAIL for BOD based on the existing design criteria will be implemented as a monthly average.

[f] Existing MAIL for mercury is negative due to domestic loading exceeding MAHL