Imperial, California
Wastewater Treatment Plant

Title 22 Engineering Report

August, 2025

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Wastewater Treatment Plant

Title 22 Engineering Report

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EXECUTIVE SUMMARY

The purpose of this report is to demonstrate that the City of Imperial Wastewater Treatment Plant (WWTP) is currently unable to produce recycled water quality effluent that complies with requirements established in Title 22 of the California Code of Regulations (CCR). However, with improvements to the UV disinfection process, the City of Imperial could provide up to 3.0 mgd of effluent to potentially be reused as recycled water.

This report will demonstrate how the plant will meet the criteria defined in Division 4, Chapter 3 of Title 22. The following criteria from Title 22 apply to the Imperial WWTP.

1. Sources and uses of recycled water (Chapter 2).
2. Use area requirements (Chapter 2).
3. Sampling and analysis (Chapter 5).
4. General design requirements (Chapter 4).
5. Reliability requirements (Chapters 6 and 7).

Wastewater flow and quality is provided, based on plant data. This data is used to demonstrate the current influent and effluent quality of the wastewater received at the plant. The current discharge permit requirements are also listed.

The plant facilities are then described and the capacity of each process established based on existing conditions. The figure below illustrates the capacity of each existing unit process at the Imperial WWTP. The values shown represent the firm capacity of each process, based on having full redundancy as required by Title 22. The values also consider and include peak hourly flows. Required upgrades to each plant process to meet Title 22 reliability requirements are also identified.

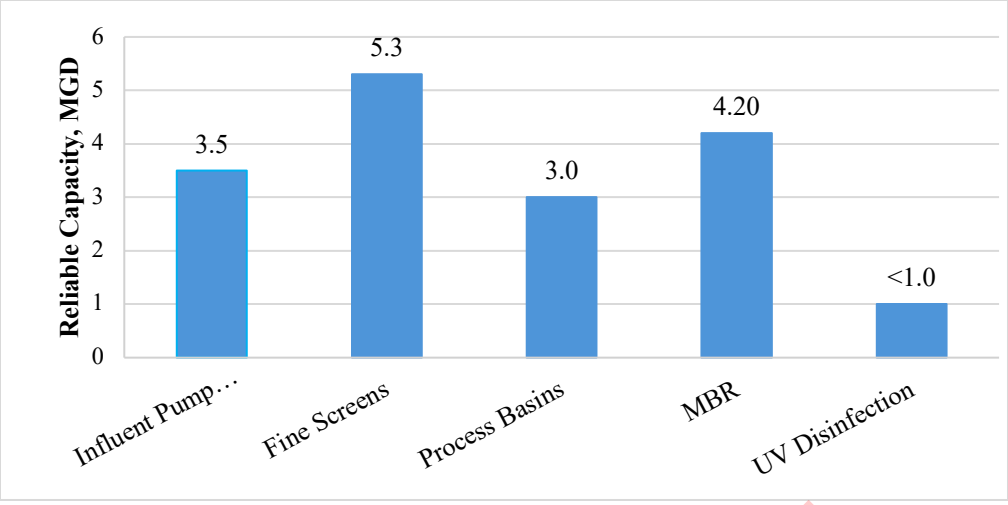

Figure 1-1. Treatment Capacity

The remainder of the report details the plant operation and reliability, including monitoring and contingency plans and demonstrates how the plant either meets or plans to meet the reliability requirements given in Title 22.

Based on the findings of this report, the following upgrades and information will be required to reliably produce and distribute up to 3.0 mgd AADF of recycled water:

1. UV disinfection replacement and expansion
2. Recycled water chlorination for distribution system, pumping, and storage facilities
3. Recycled water distributor and user report

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CHAPTER 1 - INTRODUCTION

The City of Imperial Wastewater Treatment Plant (WWTP) intends to produce a recycled water quality effluent that may be used for recycled water in the future that complies with requirements established in Title 22 of the California Code of Regulations (CCR). Currently, the plant discharges up to 2.4 million gallons per day (mgd) to the Dolson Drain, a tributary to the New River and the Salton Sea. Based on the findings shown in this report, the WWTP will be able to reliably provide up to 3.0 mgd of recycled water based on average daily flows (4.55 mgd peak flows). Note that the City may be required to provide a minimum flow to the Dolson Drain.

The City of Imperial is currently working with a few entities that are interested in receiving recycled water from the City. The water distributor will be the City of Imperial.

The objective of this document is to identify the necessary upgrades the City of Imperial intends to complete in order to comply with water recycling requirements for cooling water and potentially for landscape irrigation as described in the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0104400, Order No. R7-2021-0002. This section includes an overview of the plant and the purpose of this report.

1.1 Overview

The Imperial WWTP is located at 701 East 14th Street in Imperial, just north of 14th Street and east of the Southern Pacific Railroad as shown in Figures 1-1 and 1-2. The plant is owned and operated by the City of Imperial. The plant receives and treats domestic, commercial, and industrial wastewater generated within the City and its immediate vicinity.

The plant produces tertiary treatment level wastewater and intends to produce recycled water meeting Title 22 requirements for reuse as cooling water or landscape irrigation. Once the plant meets all requirements to produce recycled water, the City intends to make this water available and will distribute as recycled water in accordance with Title 22 requirements.

Figure 1-1-2. Facility location map

Figure 1-2. Satellite View of the Imperial Wastewater Treatment Plant

The general plant information is provided below:

WWTP Information
Discharger: City of Imperial
Discharger Contact: Dennis H. Morita, City Manager
Mailing Address: 420 South Imperial Ave, Imperial, CA 92251
Facility: Imperial Water Pollution Control Plant
Location of Facility: 701 East 14th Street, Imperial, CA 92251
WWTP Permitted Flow: 2.4 mgd

The existing WWTP includes an influent pump station and headworks facilities, three activated sludge process trains comprised of anoxic and aerobic zones, a membrane tank with associated membranes, blower and pumps, and finally a UV disinfection system. Following disinfection, effluent from the WWTP is discharged into the nearby Dolson Drain. Solids accumulated in the WWTP are pumped to the dewatering facility and further dried in sludge drying beds. A discussion of each treatment process, as well as required upgrades to meet recycled water requirements is detailed in Section 4 of this report.

Tertiary treatment level wastewater effluent is currently discharged to Dolson Drain, (identified as DP001 in the NDPES permit), a tributary to the New River and the Salton Sea. The Imperial WWTP discharge permit is for 2.4 million gallons per day (mgd) of annual average daily flow (AADF). Current average daily flow measured at the WWTP is approximately 1.5 mgd.

The City of Imperial operates the WWTP under NPDES Permit No. CA0104400, Order No. R7-2021-0002 issued on April 13, 2021 by the California Regional Water Quality Control Board (California, 2021) and is included as Appendix A. (Previous Imperial Wastewater Treatment Plant NPDES permits are Order No. R7-2010-0020 R7-2015-0030).

An updated permit will be required to allow the use of recycled water once produced by the City and approved by the State. A recycled water distribution system will need to be constructed to convey recycled water from the Imperial WWTP to use at authorized sites. A new recycled water pump station will need to be built at the plant site to supply and distribute, some recycled water storage may also be required.

1.2 Purpose of This Report

The purpose of this Title 22 Engineering Report is to describe the manner in which tertiary treatment level wastewater effluent from the Imperial WWTP will comply with the Title 22 Water Recycling Criteria. This report will demonstrate the WWTP's ability to comply with California Code of Regulations Title 22, Division 4, Chapter 3, entitled "Regulation Related to Recycled Water".

This report describes:

- The wastewater treatment facilities.
- Reliability features required in the treatment facilities to ensure safe performance.
- Contingency plan for the treatment plant's anticipated wastewater flows and characteristics.
- Recycled water quality and wastewater treatment requirements for the various types of use.
- Plant upgrades that must be completed in order to meet Title 22 reliability requirements.

Article 7, Section §60323 of the Title 22 Criteria requires submittal of an Engineering Report to the RWQCB, CRWQCB, and Division of Drinking Water (DDW) prior to completion of a new recycled water supply project.

The City of Imperial is currently a producer of tertiary treatment level wastewater that, upon meeting Title 22 requirements, could be used for cooling water, irrigation, and other uses as described in detail in the Chapter 2. This report describes only how the Imperial WWTP, as a producer and distributor, intends to comply with the latest Title 22 Regulation Related to Recycled Water, DHS Guidelines. A User Title 22 Engineering Report will be prepared separately to describe how the recycled water sites will comply with water reclamation requirements.

CHAPTER 2 - REGULATORY REQUIREMENTS

Wastewater treatment, disposal, and reuse, are regulated by local, state, and federal requirements primarily to protect public health, safety, and general welfare. In California, water recycling has received support from the U.S. Environmental Protection Agency (EPA), CRWQCB, and DDW as a means of effluent reuse and disposal. This section describes the types of reuse and regulatory requirements that pertain to the Imperial WWTP.

2.1 Water Recycling Criteria

Title 22, Division 4, Chapter 3 "Water Recycling Criteria" of the California Code of Regulations specifies treatment and effluent quality requirements for proposed types of water reuse. In addition to these requirements, Title 22 specifies reliability criteria to ensure the protection of public health. These requirements are commonly called, "Title 22 Criteria". The latest Title 22 Code of Regulations, Division 4, Chapter 3 defines the following criteria that apply:

1. Sources and uses of recycled water
2. Use area requirements
3. Recycled water system
4. Sampling and analysis
5. General design requirements
6. Reliability requirements
7. Engineering reports and operation requirements.

2.2 Source of Recycled Water

The plant receives and treats domestic, commercial and industrial wastewater generated within the City of Imperial. Influent to the City is limited to users who live within the City boundary.

2.3 Types of Reuse

In accordance with California Code of Regulations Title 22 Regulation Related to Recycled Water Requirements, the Imperial WWTP intends to provide recycled water for spray irrigation, non-restricted recreational impoundments, cooling towers, and other uses as described herein and in Article 3 of the CDPH Regulation Related to Recycled Water.

Article 3, paragraphs §60304, §60305, §60306 and §60307 describe the uses of the recycled water. Paragraph §60304 and §60306 are shown below. For Paragraphs §60305 and §60307, please refer to Title 22, Division 4, Chapter3, Article 3.

§60304 (of CDPH). Use of Recycled Water for Irrigation.

(a) Recycled water used for the surface irrigation of the following shall be a disinfected tertiary recycled water, except that for filtration pursuant to Section 6030l.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

1. *Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,*
2. *Parks and playgrounds,*
3. *School yards,*
4. *Residential landscaping,*
5. *Unrestricted access golf courses, and*
6. *Any other irrigation uses not specified in this section and not prohibited by other sections of the California Code of Regulations.*

§60306. Use of recycled water for cooling.

(a) Recycled water used for industrial or commercial cooling or air conditioning that involves the use of a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist shall be a disinfected tertiary recycled water.

(b) Use of recycled water for industrial or commercial cooling or air conditioning that does not involve the use of a cooling tower, evaporative condenser, spraying, or any mechanism that creates a mist shall be at least disinfected secondary-23 recycled water.

(c) Whenever a cooling system, using recycled water in conjunction with an air conditioning facility, utilizes a cooling tower or otherwise creates a mist that could come into contact with employees or members of the public, the cooling system shall comply with the following:

(1) A drift eliminator shall be used whenever the cooling system is in operation.

(2) A chlorine, or other, biocide shall be used to treat the cooling system recirculating water to minimize the growth of Legionella and other microorganisms.

These discharge options are being considered by the City.

2.4 Use Area Requirements & Approved Discharge Locations of Imperial Recycled Water

Title 22, Division 4, Chapter 3, Article 4 §60310 of "Regulation Related to Recycled Water" of the California Code of Regulations specifies use area requirements for disinfected tertiary treatment level wastewater effluent. Currently the use area is within the City of Imperial service area and . A 12", purple pipe, recycled water distribution line is proposed to be installed from the existing wastewater treatment plant along P Street down to its intersection with Aten Road, approximately 2 miles. Figure 2-1 shows this proposed alignment on the City's zoning map.

Zoning Map

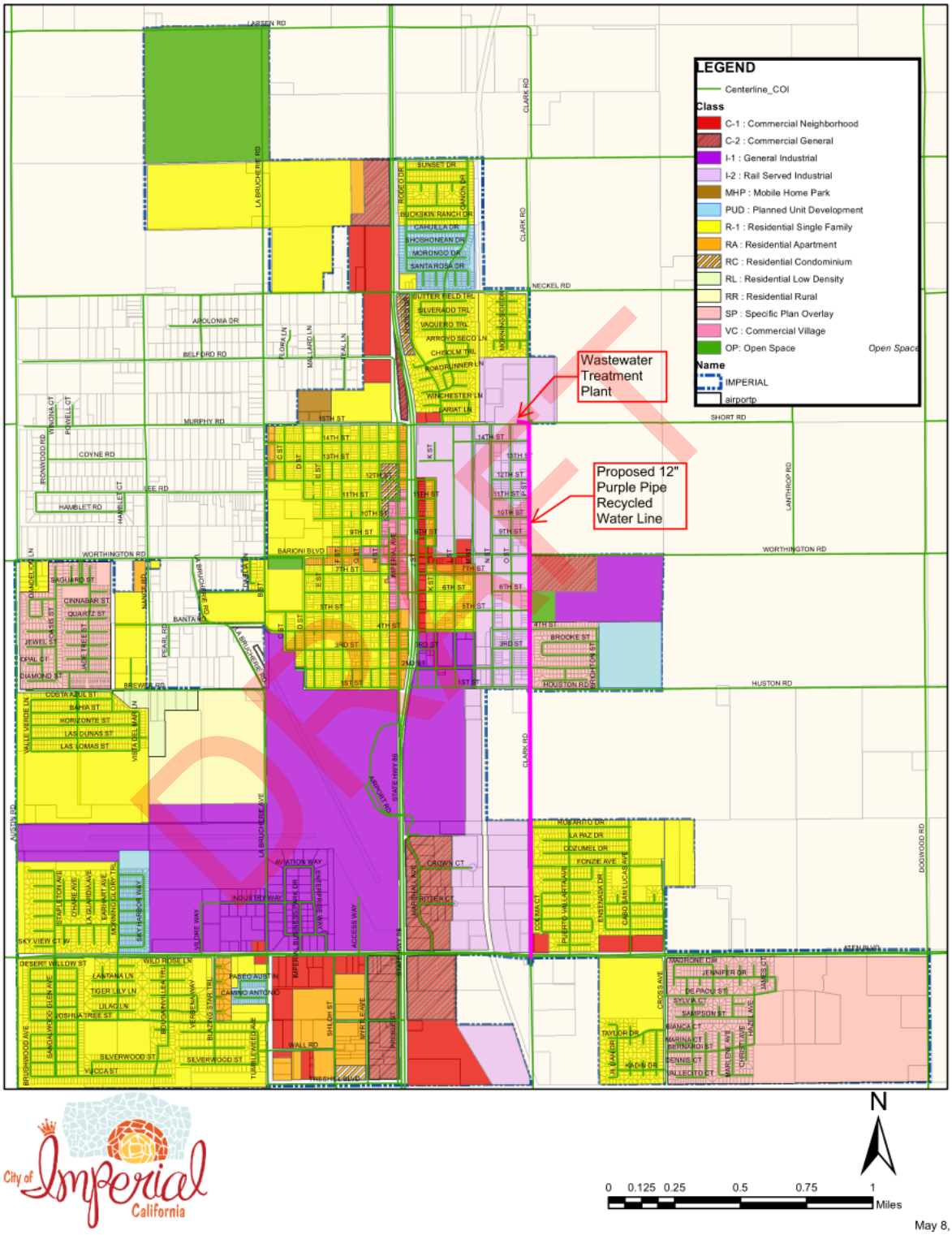

Figure 2-1. Zoning map showing recycled water pipeline

The discharge permit allows the following discharge points for Imperial disinfected tertiary treatment level wastewater effluent:

Table 2-1. Approved Discharge Locations of Imperial Recycled Water

Discharge Point	Effluent Description	Discharge Point Latitude (North)	Discharge Point Longitude (West)	Receiving Water
001	Treated Municipal Wastewater	32°, 51', 18"	115°, 33', 31"	Dolson Drain

2.5 Recycled Water System for Imperial Recycled Water

Title 22, Division 4, Chapter 3, Article 5 of "Regulation Related to Recycled Water" of the California Code of Regulations defines the requirements of a recycled water system. It is proposed the existing treatment plant be improved as follows to provide some storage and pumping facilities to feed the recycled water distribution system:

- Recycled water pump station wet well and storage.
- Wet well feed pipe
- Chlorination system
- Distribution pumps
- 12" distribution line

This system is more fully described in 4.5.1.

As the recycled water will be used for cooling tower supplement and, in the future, for irrigation in and around the Imperial area, the recycled water must be disinfected tertiary recycled water. It will be shown in Chapter 4 how the Imperial WWTP intends to comply with these Title 22 criteria.

CHAPTER 3 - WASTEWATER FLOW AND QUALITY

This section describes the anticipated wastewater flow and quality characteristics, as well as treated effluent quality limitations for the Imperial WWTP.

3.1 Wastewater Flow Characteristics

The Imperial WWTP serves primarily the municipal needs of residents and businesses within the City limits. The City's WWTP has a permitted treatment capacity of 2.4 mgd of average daily flow. Influent wastewater flow is measured at the plant headworks. Total flow, peak flow, and minimum flows are monitored and recorded continuously. Flow data is archived on a daily basis. Additionally data was retrieved from the monthly submittals the City makes to the State and that data is shown in Figure 3-1. The figure includes the average monthly flow and peak month day data. As can be seen, wastewater flows have been increasing slightly from 2022 to 2025.

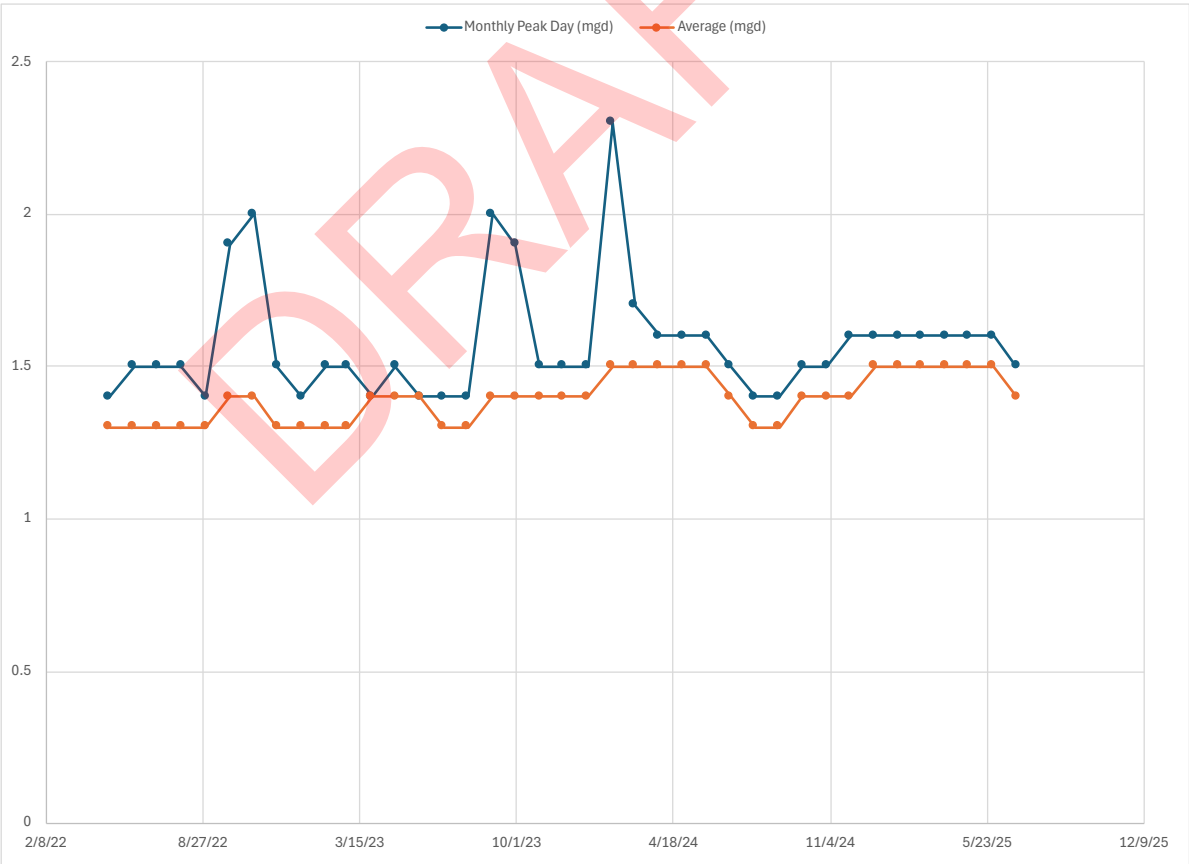

Figure 3-1. Flow Data

The average flow rate has increased from about 1.3 mgd to 1.5 mgd. The monthly peak day has also increased from about 1.5 to 1.6 mgd.

3.2 Industrial Wastewater Sources

Most of the flow to the plant is domestic and commercial. There are currently no problem constituents at the treatment facility.

3.3 Effluent Quality Limits

The effluent discharge limits for the Imperial WWTP are specified in the discharge permit. These effluent limitations are as indicated below:

Table 3-1. Physical and Biological Effluent Limitations for DP001

Parameter	Units	Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	MGD	2.4	---	---	---	---
BOD	mg/L	30	45	---	---	---
BOD	lbs/day[1]	601	901	---	---	---
Oil and Grease	mg/L	---	---	25	---	---
Oil and Grease	lbs/day[1]	---	---	---	---	---
pH	Standard Units	---	---	---	6	9
TSS	mg/L	30	45	---	---	---
Copper	µg/L	18.8	---	49.6	---	---
Copper	lbs/day[1]	0.38	---	0.99	---	---
Bis (2-ethylhexyl) Pthalate	µg/L	5.9	---	12	---	---
Bis (2-ethylhexyl) Pthalate	lbs/day[1]	0.12	---	0.24	---	---

[1] The mass-based effluent limitations are based on a design capacity of 2.4 MGD.

Additional waste discharge requirements and receiving water limitation include the following:

- Effluent Limitations
    - Percent Removal: The average monthly percent removal of BOD 5-day 20°C shall not be less than 85 percent.
    - Toxicity: There shall be no toxicity in the treatment plant effluent, nor shall the treatment plant effluent cause any toxicity in the receiving water. All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which

produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life.

- Bacteria: The bacterial density in the wastewater effluent discharged to the Dolson Drain shall not exceed the following values as measured by the following bacterial indicators:
  - E. Coli. A six-week rolling geometric mean (GM) of Escherichia coli (E. coli) not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly and a statistical threshold value (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

- Surface Water Limitations
  - Dissolved Oxygen. The concentration of dissolved oxygen to fall below 5.0 milligrams per liter (mg/L). When dissolved oxygen in the receiving water is already below 5.0 mg/L, the discharge shall not cause any further depression.
  - Oil, Grease, and Floating Material. Oil, grease, floating material (liquids, solids, foam and scum) or suspended material in amounts that create a nuisance or adversely affect beneficial uses.
  - Pesticides. The deposition of pesticides or any combination of pesticides in concentrations that adversely affect beneficial uses.
  - Color. Discoloration that creates a nuisance or adversely affects beneficial uses.
  - Biostimulatory Substances. Biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
  - Turbidity. An increase in turbidity that adversely affects beneficial uses.
  - pH. The normal ambient pH to fall below 6.0 or exceed 9.0 units.
  - Temperature. An alteration in the natural temperature, unless the Discharger can demonstrate to the satisfaction of the Colorado River Basin Water Board that the alteration in temperature does not adversely affect beneficial uses.
  - Settleable Substances. The deposition of material in amounts that cause a nuisance or adversely affect beneficial uses.
  - Chemical Constituents. Chemical constituents to be present in concentrations that adversely affect beneficial uses.

- Toxicity. Toxic pollutants to be present in the water column, sediments or biota in concentrations that adversely affect beneficial uses or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
- Taste and Odors. An increase in taste- or odor-producing substances that adversely affects beneficial uses.
- Total Dissolved Solids. The concentration of total dissolved solids (TDS) to exceed an annual average concentration of 4,000 mg/L or a maximum daily concentration of 4,500 mg/L.

3.4 Effluent Quality Limits

The City of Imperial submits monitoring reports to the RWQCB in accordance with the permit. Table 3-2 below summarizes recent effluent water quality data for some of the major regulated parameters. Complete monitoring and reporting records are available from the City or the RWQCB.

Table 3-2. 2024 Effluent Water Quality

Constituent	Units	Average	Maximum
Total Suspended Solids	mg/L	2.09	2.4
BOD	mg/L	9.93	14.53
Fecal Coliform	MPN/100 mL	ND	ND
Ammonia-nitrogen	mg/L	ND	ND
Total Inorganic Nitrogen	mg/L	14.57	21
Total Hardness	mg/L	ND	ND
Total Dissolved Solids	mg/L	1153.5	1220
Antimony	µg/L	ND	0.953
Arsenic	µg/L	ND	ND
Beryllium	µg/L	ND	ND
Cadmium	µg/L	ND	ND
Chromium (III)	µg/L	ND	ND
Chromium (IV)	µg/L	ND	ND
Copper	µg/L	3.47	5.1
Lead	µg/L	ND	ND
Mercury	µg/L	ND	ND
Nickel	µg/L	ND	ND
Selenium	µg/L	ND	ND
Silver	µg/L	ND	ND
Thallium	µg/L	ND	ND
Zinc	µg/L	ND	ND
Cyanide (free)	µg/L	ND	ND
Benzene	µg/L	ND	ND
Bromodichloromethane	µg/L	ND	ND
Chloroform	µg/L	ND	0.29
Dibromochloromethane	µg/L	ND	ND
TCDD	µg/L	ND	ND

CHAPTER 4 - TREATMENT PROCESSES

This section describes the existing treatment processes at the Imperial WWTP. The reliable capacity of each process is given and required modifications to meeting Title 22 requirements are also listed.

4.1 General Description of Facilities

The plant treats wastewater from domestic, commercial and industrial sources in the City of Imperial and its immediate vicinity. It is the goal of the City of Imperial to provide customers with recycled water from a portion of the tertiary filtered and disinfected water produced at the Imperial WWTP.

The Imperial WWTP utilizes a membrane bioreactor process, which incorporates an activated sludge treatment process. The process consists of anoxic/aerobic zones followed by membrane tanks. Permeate is removed from the process using ultrafilter membranes and permeate pumps. The overall treatment process is summarized in Table 4-1 and can be viewed in the schematic in Figure 4-1.

Table 4-1. Imperial WWTP Treatment Processes

Preliminary	Secondary	Tertiary	Solids Handling
• Primary Pump Station • Fine Screens • Microscreening • Grit Removal	• Anoxic Basins • Aerobic Basins • MBR Basins • Anoxic basins • Aerobic basins • Membranes • Permeate pumps • Recycle pumps	• UV Disinfection • Effluent flow measurement	• WAS pumps • Screw press dewatering • Sludge conveyor • WAS/Scum Pumps • Screw Presses • Sludge Drying Beds

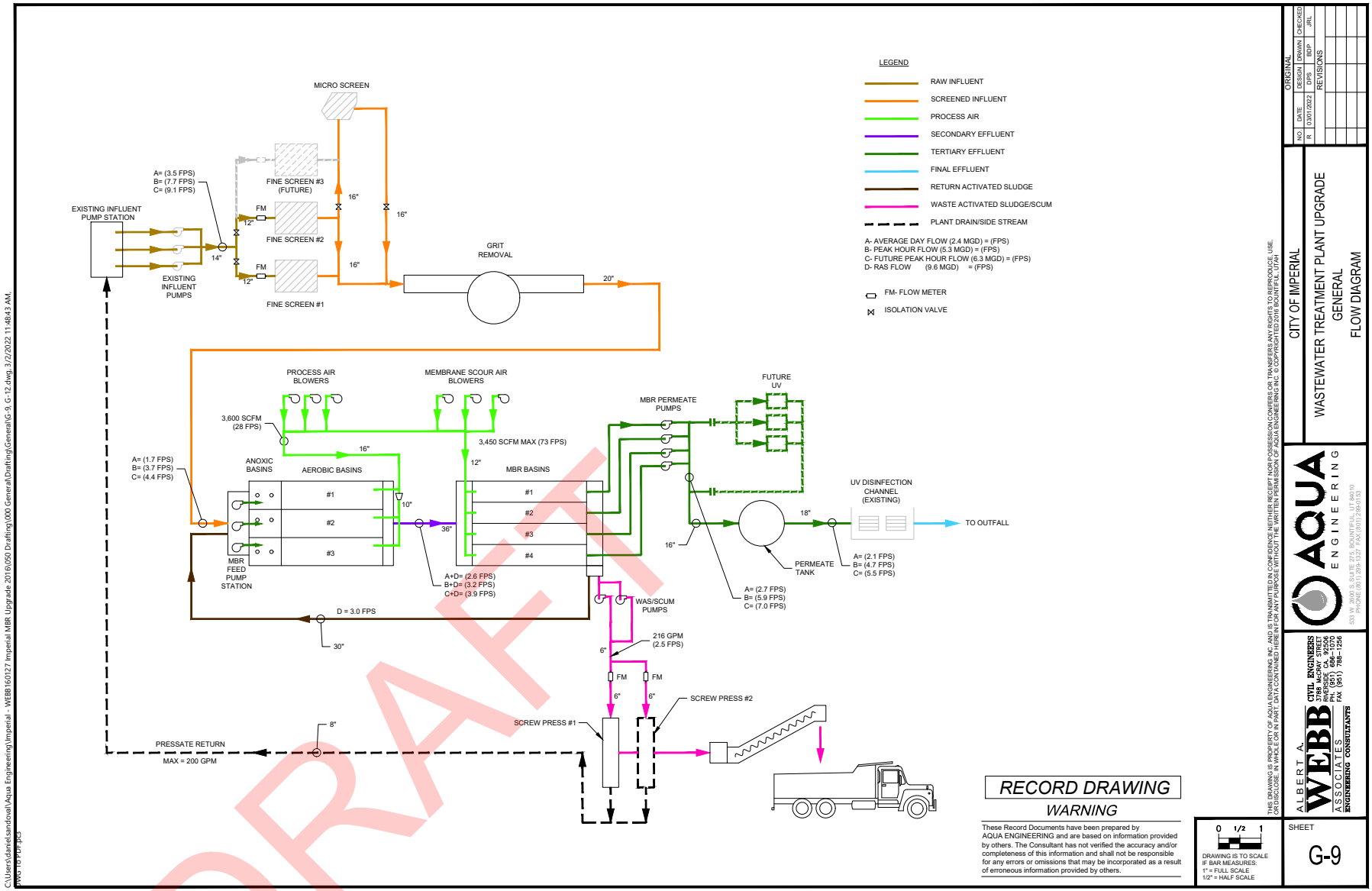

Figure 4-1. Imperial WWTP Process Flow Diagram

4.2 Primary Treatment

The primary treatment process changes wastewater influent characteristics by reducing or removing solids and deleterious material and prepares wastewater influent for further processing in secondary, tertiary and solids treatment facilities. The primary treatment process also includes sampling and metering devices. The primary treatment process at the Imperial WWTP consists of an influent pump station, fine screens, a micro-screen, and grit removal.

4.2.1 Influent Pump Station

Wastewater enters the plant from gravity sewer lines to an influent pump station. The influent pump station is a below grade wet well with an associated dry pump pit. The influent pump station includes three Gorman Rupp 6-inch pumps, each with 20-hp motors, located on the floor level of a two-level dry pit. Capacity for each pump is 1,200 GPM and total head of the pumps is 28 feet. Two pumps provide duty capacity of 2,400 GPM, and one pump provides 1,200 GPM standby capacity. Operation of two of the pumps provides an estimated 3.46 MGD capacity which exceeds the design 2.4 MGD ADF and 2.8 MDG PDF requirements. Pumping capacity may be expanded by addition of another identical pump. Pumping capacity is summarized in table 4-2.

Table 4-2. Influent Pump Station Capacity

Name	Pump #1	Pump #2	Pump #3
Capacity, mgd	1.73	1.73	1.73
Capacity, mgd (one unit offline)	3.46		
Total Head, ft	28		

4.2.2 Fine Screening

The fine screens are installed to provide protection to the downstream membrane microfilters. The system includes two fine screens each with openings of 3 mm. The screens each have a capacity of 4.1 MGD. Solids that are collected are conveyed up the center auger and then washed and compacted prior to discharge in the waste bins.

4.2.3 Micro-screen

Following the fine screens, the flow passes through a micro-screen. The micro-screen further removes material that is larger than 300 microns. This filter has a capacity of 5.3

mgd. The material captured by the filter is discharged into a dedicated conveyor, which empties the material into a dumpster. There is no redundancy for this screen but it is not necessary for plant operations or meeting the effluent water quality standards.

4.2.4 Grit Removal

A vortex grit trap is installed at the facility to help remove grit from the process. The grit trap is 10' in diameter and sized to remove grit well at 3.0 mgd. The maximum hydraulic capacity of the unit is 7.0 mgd although less grit will be removed at this flow rate. There is also a bypass channel allowing the process to be bypassed if needed.

The system includes a grit pump and a grit washer. The grit pump is sized to pump 250 gpm at 15' of head and the grit washer is also sized to receive 250 gpm. This is a Huber grit washer. Its purpose is to remove organics from the grit and return them to the waste stream while dewatering the grit to minimize water in the grit.

These grit removal processes are not required as part of the overall treatment process but do provide benefits to downstream processes, including removal of material that could settle out in basins and potentially impact life of mechanical equipment. As such, they are not essential parts of the recycled water system and do not impact recycled water capacity.

Primary treatment capacities are summarized in table 4-3 below.

Table 4-3. Primary Treatment Processes Capacity

Process	Capacity (mgd)
Fine Screens	4.1
Micro-screen	5.3
Grit Removal	3.0

4.3 Secondary Treatment

Secondary treatment is used to convert suspended organic material into a form more readily separated from wastewater. The process used at the Imperial Wastewater Treatment Plant is an activated sludge system using process basins and membrane bioreactor (MBR). A portion of the solids are sent to a solids handling facility for further treatment as waste activated sludge (WAS),

and the remainder are returned to the aeration basins as return activated sludge (RAS). The filtered effluent is conveyed to the tertiary disinfection treatment process. The activated sludge system, MBR and RAS pumping include the following process units:

4.3.1 Pump Station and Splitting Structure

Return activated sludge/recycled activated sludge combines with the raw wastewater after passing through the headworks in the MBR feed pump station. These two streams mix in the pump station wet well and are then pumped into the process basin splitting structure. The pump station includes three (3) pumps each sized to pump 5,200 gpm at 16' of head. The configuration is two (2) duty pumps with one (1) standby. Thus, the pump station is sized to pump 10,400 gpm (15 mgd) with a pump offline. Accordingly, it is sized to pump the future ADF, 3 mgd, plus 12 mgd of recycled flow or it could pump the future peak hourly flow plus 9 mgd of recycled flow. The pump station is sized to provide redundancy at the future capacity of 3 mgd.

Pumped flow enters the splitting structure which is made up of a concrete channel with downward opening slide gates to each process train. The gates can be adjusted to isolate a process train and/or split flow to trains that are in operation.

4.3.2 Anoxic Basins

The first section of each process train is an anoxic basin. These basins are each 30'x30' with 18' of water depth, holding 121,200 gallons each. The basins are mixed with 2 eductor tube mixers, providing for a completely mixed environment. The basins provide sufficient volume for denitrification to occur in the system. This is the process where nitrate is converted to nitrogen gas, thus reducing the total nitrogen in the effluent stream. One basin could be offline and treatment in the other two (2) basins would be sufficient to meet the effluent requirements.

4.3.3 Aeration Basins

The liquid stream flows from the anoxic basins to the aeration basins by gravity flow through an opening in the wall between the basins. The aeration basins are 90'x30' with 18' of water depth, holding 363,530 gallons. A single anoxic basin and an aerobic basin make up a single process train. This basin is where oxygen is provided in the process, allowing the biology to reduce biochemical oxygen demand (BOD) and reduce ammonia

nitrogen to nitrate nitrogen. Oxygen is infused in the water and the contents of the basin are mixed by a fine bubble diffused aeration system installed on the floor of each of the aerobic basins. Air is provided to the aeration system by process blowers. Enough air is provided such that any two (2) basins could provide sufficient oxygen to the process to meet the effluent requirements.

Again, each anoxic and aeration basin are tied together in a single process train. If one of these basins is offline then its associated anoxic or aeration basin would also be offline while the other two process trains can remain in operation. Thus, complete process redundancy is provided for this part of the treatment process.

4.3.4 Process Blowers

Process blowers are provided and installed in the membrane bioreactor (MBR) building. Three (3) process blowers are installed, each with a capacity of 1,800 scfm at 9.5 psig. The blowers are high-speed turbo blowers and each has a 120 hp motor. These blowers run in a two (2) duty, one (1) standby configuration, providing complete redundancy for the process air requirements.

4.3.5 MBR Basins

The process trains discharge water into a common channel, which in turn feeds the influent membrane basins channel. This channel includes slide gates that can isolate each of the four (4) membrane basins from influent flow if needed.

Each membrane basin is 30’ long x 9’ wide x 12’deep with a water depth of approximately 9.5’. Three (3) membrane cassettes are installed in each of the basin, for a total of 12 installed cassettes. There is room in each basin for a fourth cassette to be installed in the future if needed. The system is currently sized to run at a reduced flux rate which improves overall performance of the system and reduces operational requirements such as membrane cleaning. With all trains running and the influent flow of 2.4 mgd, the flux rate is estimated to be 10.5 gfd. This is well below the maximum flux rate accepted by the manufacturer. The manufacturer has provided a guarantee that the system can produce 4.2 mgd with one membrane train offline (3 duty, 1 standby), with a max flux rate of 24.57 gfd. Thus, rated capacity of the membrane trains is 4.2 mgd, with redundancy. ZeeWeed 500D cassettes and membranes have been provided for this project.

4.3.6 Membrane Scour Blowers

Scour air blowers are provided and installed in the MBR building. These blowers provide scour air to each membrane cassette. The air keeps the membranes from fouling with solids, keeps the membrane trains mixed, and also provides some oxygen for the overall process. There are three (3) blowers installed in a two (2) duty, one (1) standby configuration. Each blower is sized to provide 1,750 scfm at 5.0 psig of pressure. These are also high-speed turbo blowers.

4.3.7 Permeate Pumps

Permeate pumps are installed, one per membrane train. The four (4) permeate pumps are rotary lobe pumps and provide to pump permeate from the membranes to the permeate storage tank. Each pump is sized to pump up to 1,230 gpm (1.77 mgd) at 42' of head. From a redundancy standpoint, if a membrane train or pump is offline, the other three (3) trains can handle the total plant flow, up to 4.2 mgd of ADF.

4.3.8 Return Activated/Recycle Sludge (RAS)

Activated sludge systems require solids to be returned to the process in order to maintain biological populations in the process tanks. Additionally, membrane bioreactor systems require increased recycle flows to make sure solids do not accumulate on the or around the membranes. This combined process is achieved by gravity at the back end of each membrane train. A weir is placed on the back of each membrane tank and the return flow simply overflows the weir and then is conveyed by gravity back to the membrane feed pumps at the front of the process basins.

4.3.9 Waste Activated Sludge (WAS)

There are two (2) WAS/scum pumps installed in a one duty, one standby configuration. Each pump has a capacity of 270 gpm at 51' of head. These are rotary lobe pumps and pump these solids directly to the screw press dewatering facility. There is sufficient capacity for this system to run using a single pump and thus full redundancy is provided.

Title 22 Code of Regulations defines filtered wastewater as follows:

"Filtered wastewater" means an oxidized wastewater that meets the criteria in subsection (a) or (b):

(a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following: (1) At a rate that does not exceed 5 gallons per minute per

square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and (2) So that the turbidity of the filtered wastewater does not exceed any of the following: (A) An average of 2 NTU within a 24-hour period; (B) 5 NTU more than 5 percent of the time within a 24-hour period; and (C) 10 NTU at any time.

(b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following: (1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and (2) 0.5 NTU at any time.

The MBR process as described in the preceding paragraphs meets the requirements of subsection b and the turbidity is monitored continuously at the plant. Figure 4-2 shows the online turbidity at the facility. As seen, the turbidity is typically below 0.20 NTUs and in compliance with the Title 22 requirements for tertiary filtration. Capacity of the secondary treatment process is limited to the membrane capacity with 1 train offline. Thus, the capacity is **4.2 mgd**.

ADD TURBIDITY CHART

Figure 4-2. Effluent turbidity chart

4.4 Tertiary Treatment

The effluent from the membrane bioreactor is currently discharged to the existing UV channels and discharged to Dolson Drain. The existing disinfection treatment process consists of a UV distribution channel and two in-channel ultraviolet (UV) disinfection systems.

4.4.1 UV Disinfection

All flow from the tertiary filters is collected in the existing UV Distribution Box before being distributed to the UV channel. Flow from the membrane bioreactor enters the UV distribution structure via an 18-inch pipe.

The existing UV system, a Trojan System UV3000 Plus was installed in 2006 to replace an earlier UV system. The existing UV system has two banks, six modules per bank and six lamps per module for a total of 72 lamps. The current UV system can treat 10.6 MGD with both banks online to meet current permit requirements. If one unit is offline, the flow capacity is reduced to 5.3 MGD. These capacities are based on meeting an effluent requirement of 126 E.coli per 100 mL per 30 day geometric mean, 65% UVT and providing a UV dose of 24 mJ/cm^2.

Part of the requirements of production and distribution of recycled water is to provide validation testing of the equipment. This testing will be required to provide validation for the system and proposed flow capacity of the system.

UV System Requirements and Regulation for Recycled Water System

The California Water Recycling Criteria, Title 22, requires that UV disinfected product water exhibit 5-log (99.999%) poliovirus inactivation and a 7-day median total coliform of 2.2 MPN per 100 mL. Five-log inactivation of the poliovirus is achievable with ultrafiltration and a UV dose of at least 80 millijoules per square centimeter (mJ/cm^2 or mWs/cm^2). To achieve these criteria, the California DHS refers to the performance criteria documented in the "Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse" (NWRI/AWWARF, Third Edition) for application of UV disinfection on filtered effluent.

As previously indicated, the existing UV was not designed to provide sufficient disinfection to meet the Title 22 requirements. This system provides only a fraction of the requirement dose to achieve the disinfection requirements, estimated to be for less than 1 mgd. The existing system could be expanded and would require 6 additional banks and 1 additional channel. A second option would be to install new in-vessel units in the MBR

building. The building was designed to allow for these to be added in the future. Each unit would be sized to treat approximately 1.65 mgd with a total of 3 units being installed to allow for treatment of the entire peak flow from the treatment plant with 1 unit off-line.

Capacity of the current tertiary disinfection system is limited by the existing UV system, which is not designed to provide sufficient UV dose to disinfect the treatment plant effluent to recycled water standards. However, if the in-vessel UV system is installed as described previously, the system could achieve a capacity of 3.30 mgd with 1 unit offline.

4.5 Other Treatment Processes

This section of the report discusses other process capacities at the WWTP and current reliable capacities.

4.5.1 Recycled Water Storage and Distribution

The WWTP does not currently have any recycled water storage and distribution processes. In order to make the water available to recycled water users, a wet well and pumping system will need to be provided at the WWTP downstream of the UV disinfection system. This system improvements are described as follows:

- Recycled water pump station wet well and storage. A small concrete tank will be constructed to provide some buffer capacity for the distribution pumps. The wet will be sized to provide for 20,000 gallons of capacity. The tank is estimated to be 20' square and have a side wall depth of 12', max water depth 10'. The tank will be partially buried with approximately 4' extending above grade and 8' below grade. Construction will be reinforced concrete and it will have a cover on it.
- Wet well feed pipe. A pipe will be connected to the existing from the existing outfall line with an automated fill valve. The valve will open and fill the tank as needed to maintain the water depth in the wet well. In the event recycled water quality parameters are not met, the valve will close, not allowing off spec water to enter the wet well.
- Chlorination system. The water will be chlorinated as it flows into the basin, providing for some chlorine residual in the distribution system. This is not part of the disinfection process but is provided to keep the distribution system clean.

- Distribution pumps. Two pumps will be installed at this time and pull water from the wet well and pump it into the distribution system. The pumps will be sized to each pump up to 1.5 mgd at 60 psi, providing ample capacity to deliver water into the distribution system and to the end users. A common header will be connected to the discharge of the pumps and a common magnetic flow meter will be installed to measure flow entering the distribution system.
- 12" distribution line. A 12", recycled water distribution line will be installed and run south on P street from the treatment plant to the intersection with Aten Road. Near this intersection, the water will be delivered to the end user, estimated to be used for cooling towers.

4.5.2 Power Supply

The Imperial WWTP receives electrical power from IID. A separate standby generator is available onsite.

4.5.3 Alarms

Division 4, Chapter 3, Article 8, Section §60335 of Title 22 sets requirements for alarm devices required for various unit processes and it states that alarm must be installed to provide warnings of:

1. Loss of power from the normal power supply.
2. Failure of the biological treatment process.
3. Failure of the filtration process.
4. Failure of the disinfection process.
5. Failure of the coagulation process.
6. Any other process failure for which warning is required by the regulatory agency.

The Imperial WWTP currently has a Supervisory Control and Data Acquisition (SCADA) system that monitors all vital functions of the plant and assists operations staff. The control system records data on process operation and for permit compliance and provides information on the status of equipment and plant operation. The SCADA system is comprised of programmable logic controllers (PLC) by various manufacturers.

All required alarm devices currently run on the normal power supply of the WWTP, backed up by the standby generator. Individual alarms are displayed in the SCADA control

system, alerting staff to issues at the plant, backed up on UPS and standby power supply. Additionally, if alarms are not acknowledged and resolved by onsite operators, then the control system notifies on-call operators via text message or email of alarm conditions. Operators can access the control system remotely to resolve issues or be informed on what is occurring at the plant. They can then address alarms as needed.

4.5.4 Solid Handling

Stabilized, waste activated sludge (WAS) and secondary scum are pumped from the membrane treatment basins to the screw press dewatering facility. Screw presses are used to dewatering to a solids concentration of about 15-16 percent. The dewatered sludge is then conveyed to the sludge drying beds and further dried. Dried solids are then hauled to the landfill for disposal.

4.5.5 Storm Water Runoff

Storm water captured on the WWTP site is conveyed to the headworks and treated as part of the influent plant flow.

4.5.6 Other Treatment Process Modifications Required

Additional modifications to the treatment process are not anticipated.

CHAPTER 5 - MONITORING PROGRAM

5.1 Monitoring and Reporting Requirements

All sampling and sample preservation are conducted in accordance with "Standards Methods for the Examination of Water and Wastewater" (latest edition American Public Health Association, 2012). All lab procedures are performed by a state certified laboratory in accordance with procedures under the latest edition of 40 CFR 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the EPA unless otherwise specified by the RWQCB. The following discussion summarizes key aspects of the monitoring and reporting program in RWQCB Order No. R7-2021-0002 (NPDES No. CA0104400) which is the Imperial WWTP discharge permit.

5.1.1 Reportable Detection Limits

Laboratories are required to calibrate the analytical system down to the Reportable Detection Limits (RDLs) or minimum levels (MLs) as listed in the permit (Order No. R7-2021-0002) and summarized in the tables included in this Section. An alternative RDL may be used if approved by the RWQCB Executive Officer.

Where no methods or MLs are specified, then monitoring is conducted in accordance with methods/MLs approved by the RWQCB or CRWQCB consistent with the CRWQCB's Quality Assurance Program. In addition, the RWQCB and/or the EPA may specify test methods which are more sensitive than those specified in 40 CFR 136.

The reporting protocol of analytical determination for the presence of chemical constituents in a sample shall use the following:

1. Sample results greater than or equal to the ML to be reported as measured by the laboratory (the measured chemical concentration in the sample).
2. Sample results less than the reported ML but greater than or equal to the laboratory's Method Detection Limit (MDL), are reported as "Detected, but Not Quantified," or "DNQ." The estimated chemical concentration of the sample must also be reported. MDL is defined as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the concentration is greater than zero, as defined in 40 CFR 136.

3. Sample results not detected above the laboratory's MDL are reported as "not detected" or "ND."

5.1.2 Noncompliance

For every item of monitoring data where the requirements are not met, the monitoring report shall include a statement discussing the reasons for noncompliance, the actions undertaken or proposed that will bring the discharge into full compliance with requirements at the earliest time, and an estimate of the date when the City of Imperial will be in compliance. The City shall notify the Regional Water Board by letter when compliance with the time schedule will be achieved.

5.1.3 Calibration of the Measurement System

The flow measurement system shall be calibrated at least once per year or more frequently (as specified in the O&M manual) to ensure continued accuracy. When the Imperial WWTP effluent will be used for surface irrigation or groundwater recharge, the UV flow meters must be verified for accuracy on a monthly basis against other flow determination methods. All other monitoring instruments and devices used by the City of Imperial are maintained and calibrated as necessary to ensure their continued accuracy.

5.1.4 Reporting Protocol

The City of Imperial is required to submit monthly, semi-annual, and annual Self-Monitoring Reports (SMR) including the results of all required monitoring using EPA-approved test methods or other test methods specified in RWQCB Order No. R7-2021-0002. Monthly reports are due on the 1st day of the second month following the end of each calendar month; semi-annual reports are due on August 1 and February 1 following each semi-annual period; annual reports are due on February 1 following each calendar year. Monitoring periods and reporting for all required monitoring shall be completed according to Table 5-1:

Table 5-1. Imperial WWTP Monitoring Periods and Reporting Summary

Sampling Frequency	Monitoring Period Beginning	Monitoring Period	Self Monitoring Report Due Date
Continuous	Permit effective date	All	Submit with monthly eSMR
Daily	Permit effective date	(Midnight through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly eSMR
Weekly	Permit effective date	Sunday through Saturday	Submit with monthly eSMR
Monthly	Permit effective date	1st day of calendar month through last day of calendar month	First day of second month from end of monitoring period.
Quarterly	Permit effective date	April 1 through June 30 July 1 through September 30 October 1 through December 31 January 1 through February 28	August 1 September 1 February 1 May 1
Semi-Annually	Permit effective date	April 1 through September 30 October 1 through March 31	November 1 May 1
Annually	Permit effective date	April 1 through March 31	1-May

The monthly reports for June and December should include a roster of plant personnel, including job titles, duties, and level of State certification for each individual. The following should be included in the annual report:

1. Tabular and graphical summaries of the monitoring data obtained during the previous year.
2. Discussion of corrective actions are taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements.
3. A summary of quality assurance (QA) activities for the previous year.

For priority pollutants that do not have effluent limitations, but are required to be monitored, the City of Imperial must require the testing laboratory to quantify constituent concentrations to the lowest achievable MDL as determined by the procedure found in 40 CFR 136. If MDL value cannot be achieved, the City of Imperial must submit justification as to why a lower MDL value cannot be achieved and report to RWQCB together with monthly monitoring reports.

For non-priority pollutant monitoring, all analytical data should be reported with identification of minimum levels and with method detection limits, as determined in 40 CFR 136.

Discharge monitoring data needs to be submitted in a format acceptable to the RWQCB. Specific reporting formats may include preprinted forms, spreadsheets, and/or electronic media. The results of all monitoring required by the permit must be reported to the RWQCB and must be submitted in such a format to allow direct comparison with limitations and requirements of the constituents listed in the permit.

5.1.5 National and California Toxics Rule

The National Toxics Rulle (NTR) and California Toxics Rule (CTR) include water quality criteria for priority pollutants and are applicable to this discharge. The EPA adopted the NTR on December 22nd, 1992, which was amended on May 4th, 1995, and November 9th, 1999, and the CTR on May 18th, 2000, which was amended on February 13th, 2001.

The EPA published the adopted CTR (40 CFR §131.38). The CTR promulgates new criteria for both human health protection and protection of aquatic life. New numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants are listed. In addition, the CTR contains a compliance schedule provision, which authorizes the CRWQCB to issue schedules of compliance for new or revised NPDES permit limits based on the federal criteria where certain conditions are met.

5.1.6 Water Quality-Based Effluent Limitations

The RWQCB conducted a reasonable potential analysis (RPA) for each priority pollutant with an applicable criterion or objective to determine if Water Quality-Based Effluent Limitations (WQBEL) is required. The RWQCB analyzed effluent data to determine if a pollutant in a discharge has the reasonable potential to cause or contribute to an excursion above a CRWQCB water quality standard. For all parameters that have the reasonable potential to cause or contribute to an excursion above a water quality standard, numeric WQBELs are required. The RPA considers criteria from the CTR, and when applicable, water quality objectives specified in the Basin Plan.

Sufficient data are needed to conduct a complete RPA. If data are not sufficient, the discharger will be required to gather the appropriate data for the RWQCB to conduct the RPA. Upon review of the data, and if the RWQCB determines that WQBELs are needed to protect the beneficial uses, the permit will be reopened for appropriate modification.

The RPA was performed for the priority pollutants on effluent data supplied by the City of Imperial from October 2015 through September 2020 and found that two constituents posed a reasonable potential to cause or contribute to a violation of a water quality standard. These were copper and Bis(2-ethylhexyl) Phthalate. Refer to the discharge permit for a summary of priority pollutants that required an RPA.

5.1.7 Toxicity Monitoring

The permit requires toxicity monitoring in the plant effluent. The permit also requires that the plant effluent not cause any acute or chronic toxicity in the receiving water. All waters need to be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life.

Order No. R7-2021-0002 contains no numeric limitation for toxicity, however the City of Imperial is required to conduct chronic toxicity monitoring.

5.1.8 Quality Assurance (QA) Plan

Water quality samples from the Imperial WWTP are sent to a State certified laboratory for analysis. The laboratory has a written QA plan, which is required by the CRWQCB. Duplicate chemical analyses must be conducted on a minimum of 10 percent of the samples, or at least one sample per month, whichever is greater. A similar frequency should be maintained for analyzing spiked samples. When requested by the RWQCB or EPA, the City of Imperial will participate in the NPDES discharge monitoring report QA performance study.

5.2 Sampling and Analysis

The monitoring locations, listed in Table 5-2, are used by the City to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements contained in Order R7-2010-0020.

Table 5-2. Imperial WWTP Monitoring Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
	INF-001	Wastewater influent to the treatment facility. The sampling station shall be located upstream of any in-plant return flows where a representative inflent sample to the treatment plant can be obtained.
001	EFF-001	Effluent discharged from the treatment facility into the Dolson Drain: Latitude: 32° 51' 15" N Longitude: 115° 33' 41" W
--	RSW-001	Receiving water (Dolson Drain) monitoring location not to exceed 100 feet upstream from the location where the effluent enters Dolson Drain
--	RSW-002	Receiving water (Dolson Drain) monitoring location not to exceed 200 feet downstream from the location where the effluent enters Dolson Drain, at a point where a plume would be expected.

Water quality monitoring is required under Title 22 Water Recycling Criteria and the Imperial WWTP discharge permit. Title 22 requires that effluent samples be taken at least daily for total coliform bacteria and continuous turbidity monitoring and recording is also required.

Specific guidelines and parameters are established in the discharge permit for sampling and analysis of the influent and effluent streams, biosolids, and receiving waters. Depending on the constituent, sampling is required to be a continuous, 24-hour composite, or grab specimen taken on regularly scheduled intervals (daily, weekly, monthly, quarterly, semi- annually or annually).

5.3 Influent Water Monitoring

The City of Imperial monitors the WWTP influent at INF-001 as listed above.

Table 5-3 summarizes the influent water flow and quality monitoring requirements. Included in the table is the type and frequency of sampling, suggested laboratory analysis methods, and reporting basis.

Table 5-3. Influent Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Flow Meter (Totalizer) Reading	Daily	See Section I.B of the MRP
BOD_5	mg/L	24-Hr. Composite	Biweekly	See Section 1.D of the MRP
BOD_5	lbs/day	Calculated	"	"
TSS	mg/L	24-Hr. Composite	"	"
TSS	lbs/day	Calculated	"	"

5.4 Effluent Monitoring

The Imperial WWTP effluent EFF-001 to the Dolson Drain is monitored at Station RSW-002 as listed in Table 5-2 above. Table 5-4 summarizes the effluent water flow and quality monitoring requirements. Samples for total coliform bacteria are collected at least daily from the disinfected effluent. Turbidity analysis is done continuously by an online turbidimeter. Compliance with daily average operating filter effluent turbidity is determined by averaging the levels of recorded turbidity taken at a minimum of four-hour intervals over a 24-hour period. The results of the daily average turbidity determinations are reported monthly.

Table 5-4. Effluent Water Quality Monitoring

Parameter	Units	Type of Sample	Minimum Sampling Frequency	Required Analytical Test Method and Minimum Level
Flow	MGD	Flow Meter (Totalizer) Reading	Daily	See Section I.B of the MRP.
pH	Standard Units	Grab	"	See Section 1.D of the MRP.
Chlorine, Total Residual or Dechlorinating Agent	mg/L	Recorder	Continuous[6]	"
Temperature	Degree F	Grab	Weekly	"
Escherichia Coli (E. Coli)	MPN or cfu/100 ml	Grab	Weekly[7,8]	"
BOD_5	mg/L	24-Hr. Composite[9]	Biweekly	"

Total Suspended Solids	"	24-Hr. Composite	"	"
Copper	µg/L	Grab	Monthly	See Section 1.E of the MRP.
Copper	lbs/day	Calculated	"	"
Bis(2-ethylhexyl) Phthalate	µg/L	Grab	"	"
Bis(2-ethylhexyl) Phthalate	lbs/day	Calculated	"	"
Dissolved Oxygen	mg/L	Grab	Monthly	"
Oil and Grease, Total[10]	"	"	"	See Section 1.D of the MRP.
Nitrates as N	"	"	Quarterly	"
Nitrites as N	"	"	"	"
Ammonia as N	"	"	"	"
Total Nitrogen as N	"	"	"	"
Total Phosphate as P	"	"	"	"
Ortho-Phosphate as P	"	"	"	"
Total Dissolved Solids	"	"	"	"
Hardness, Total (as CaCO3)	"	"	"	"
Priority Pollutants[11]	µg/L	24-Hr Composite/Grab	Yearly	See Section 1.E of the MRP.

Monitoring frequency for priority pollutants that are detected during the required annual monitoring at a concentration greater than specified for that pollutant in Attachment E of the discharge permit shall be accelerated to quarterly.

5.5 Recycled Water Monitoring

The effluent sampling station for recycled water is located at the new recycled water distribution pump station, which is the outfall to the recycled water use areas.

5.5.1 Regulations & Responsibilities for Recycled Water Users

The City of Imperial is responsible for assuring that recycled water is delivered and utilized in conformance with the permit and the reclamation criteria contained in Title 22, Division 4, Chapter 3, Sections 60301 through 60355, California Code of Regulations (June 18th, 2015, Regulations Related to Recycled Water).

1. Receiving Water Monitoring: The City of Imperial is required to submit a plan for annual sampling and testing of mercury levels in fish flesh samples to be approved by

the RWQCB. The frequency of monitoring and submission of report shall be stipulated in the approved plan.

CHAPTER 6 - RELIABILITY REQUIREMENTS FOR FULL TREAMENT

Article 10 of Title 22 addresses reliability requirements for full treatment in the following Section §60341 through Section §60355. The purpose of a contingency plan is to assure that untreated or adequately treated wastewater is not delivered to the recycled water use areas. Contingency measures do not exclusively refer to emergency events creating an unacceptable plant effluent quality but also to times when treatment plant units need to be taken offline for periodic maintenance, repair, or cleaning. An emergency influent or effluent storage facility is currently not available. The City of Imperial's contingency plan to maintain continuous, high-level treatment at the WWTP is described in this section.

6.1 Contingency Plan

The basis for the Imperial WWTP contingency plan relies on the use of multiple treatment units, standby equipment, and the ability to treat peak flows. As described for each process in Section 4 of this report, the annual average daily rated capacity of the plant is 2.4 mgd. With plant improvements, the rated capacity and recycled water capacity is expected to be 3.0 mgd. Reliability is provided by the following:

- Standby treatment units and equipment,
- Reliance on downstream treatment processes, and
- Standby engine generator for emergency power

Section §60341 of Title 22 addresses reliability requirements for full treatment through long or short-term storage of untreated or partially treated wastewater. City of Imperial WWTP reliability is achieved by standby treatment units and equipment.

Sections §60343 through §60343 of Title 22 deal with reliability features of the following treatment steps: preliminary treatment, biological treatment, filtration, coagulation, disinfection and other alternatives of treatment.

The reliability of Imperial's WWTP treatment units are described in detail in Chapter 4 of this report and herein:

1. Reliability of the primary treatment process is met by having a duty and standby screen with a treatment capacity of 5.3 mgd AADF of screened effluent. Reliability in the influent

pumping station is provided by three duty pumps and one standby pump with a total capacity of 3.5 mgd AADF.

2. Reliability of the biological treatment will be achieved by alarms at the blower stations to indicate when a blower has a failure. The average daily flow of 3.0 mgd can be treated through two aeration basins (leaving the third basin not in operation) and with one blower on standby at each of the blower stations.
3. Reliability of the secondary filtration, MBR, process is achieved by having 3 duty and 1 standby membrane trains, with all pumps and ancillary equipment being fully redundant per train. Additionally, the blowers that supply the scour air for this process are installed in a 2 duty, 1 standby configuration. Thus, all components have full redundancy and this process provides a firm capacity of 4.2 mgd with 1 train offline.
4. Reliability of the disinfection process is met by the upgrade disinfection system, designed around the Trojan UVFit Disinfection vessels. Three (3) vessels will be installed providing for a 2 duty, 1 standby configuration and providing up to 3.3 mgd of reliable capacity. The system includes alarms for lamp failures, UV transmittance and intensity, which will be connected to the plant's main SCADA and master alarm system. This system, once upgraded will meet recycled water requirements.

As previously indicated, process monitoring is in place and part of the contingency of the treatment facility. All processes are monitored by the control system and the system provide automatic redundancy for all processes. The following describes the controls for each process:

- Influent pump station – If a pump goes offline, the other two pumps are automatically available and online as needed. This is automated by the control system. Alarms will also notify staff of the situation so it can be resolved quickly.
- Fine screens – If a screen goes offline, the second screen is online, in operation, and ready to receive and process all flow. Staff will be alarmed if a screen goes offline.
- Membrane feed/RAS pump station – Pumps are automated and controlled by SCADA. If a pump goes offline, staff is notified via alarms and the remaining pumps automatically handle the flow requirements.
- Process trains – Redundancy is provided by the three trains and the system could be run with any two trains. This is not an automated process and would require staff to adjust splitting

gates to divert flow from an offline basin to the remaining basin. Air provided by process blowers is automated and will adjust as needed to provide sufficient oxygen for the process.

- Membrane trains/permeate pumps – The four-train system can process design flows with a single train offline. The control system will automatically adjust the remaining online trains to process the required flow. Pumps and blowers associated with this process are also controlled automatically and will adjust as needed to meet process demands with a unit offline.
- UV disinfection – Once updated, the system will provide full redundancy for disinfection. The system will included automated valves such that a unit could go offline and the backup unit will automatically start up and flow will be diverted to operational unit.

The final contingency is if the effluent does not meet the recycled water quality requirements, such as turbidity. If turbidity is out of spec then the water will not be delivered to the recycled water pumps and will be discharged to the current outfall, Dolson Drain.

CHAPTER 7 - OPERATION AND MAINTENANCE PLAN

Operation and maintenance of the Imperial WWTP are described in this section. The City of Imperial operates the WWTP and sewer collection system. Staffing and performing preventive maintenance plans are discussed below.

7.1 Personnel

Article 7, Section §60325 of Title 22 establishes requirements for plant personnel. Imperial is a Class IV WWTP fully staffed with qualified operations personnel and meeting requirements established in Section §13625 of the Water Code. Operators are physically working at the plant a minimum of 17 hours per day and are on-call 24 hours per day, 7 days per week. Certified operators permanently assigned to the plant are listed in Table 7-1.

Table 7-1. Operations Personnel

Operator Grade	Position	Number of Persons Permanently Assigned to WWTP
V	Wastewater Superintendent	1 - full time
III	Operator III	1 - full time
II	Operator II	1 - full time
I	Operator I	1 - full time
IV	Operator IV/Vice President	Part Time/On Demand

Maintenance personnel are also on duty as required. Regular equipment maintenance including calibration, lubrication and cleaning is performed by the onsite operation staff. The City of Imperial uses local contractors as needed for major equipment maintenance.

7.2 Preventive Maintenance Program

Article 7, Section §60327 of Title 22 requires that a preventive maintenance program shall be provided to ensure that all equipment is kept in reliable operating conditions. Imperial WWTP personnel utilize computerized maintenance management software. Under the preventive maintenance program, inspections, lubrications, and operational rotation and repair of all mechanical, electrical, and support equipment ae regularly scheduled. In addition to retaining manufacturers' maintenance manuals, files are kept for all major equipment. Routine or regularly scheduled maintenance activities are carried out with the aid of detailed checklists to ensure that important checks and servicing are not overlooked and that complete records are kept for all major equipment components. An organized system, based on work orders with priority determined on a

"need" basis, coordinates the operation and maintenance personnel at the plant. The maintenance department normally keeps lists of replacement parts necessary for specific equipment, and in many cases, stock replacement parts at the plant site.

7.3 Operating Records and Reports

Article 7, Section §60329 of Title 22 (regulations related to recycled water) sets forth operating records and reports requirements.

WWTP personnel maintain all necessary operating records. These records include but are not limited to the following:

- Records of operational problems, plant and equipment breakdowns, all corrective or preventive actions taken.
- Process or equipment failures triggering alarms are recorded and maintained separately in the SCADA system. The time and type of the alarm is recorded by the SCADA system and is available any time. The handwritten recorded information includes the cause of failure and corrective action(s) taken.
- Monthly summary of operating records as specified above is and will be filed monthly with the regulatory agency.
- Any discharge of untreated or partially treated wastewater is and will be immediately reported by telephone to the regulatory agency, the State Department of Health, and the local health officer.

CHAPTER 8 - RECYCLED WATER USE & REGULATIONS

The City of Imperial is responsible for assuring that recycled water is delivered and utilized in conformance with the latest City of Imperial NPDES permit Order No. R7-2021-0002, latest CDPH Regulations Related to Recycled Water, and Title 22, Division 4, Chapter 3 Regulations. This section describes the responsibilities of the recycled water producer and users and a summary of these responsibilities are presented in Table 8-1 of this report.

8.1 Types of Title 22 Engineering Reports for Recycled Water Use

In accordance with California Code of Regulations Title 22 Water Recycling Criteria requirements, the following Title 22 Engineering Reports must be prepared:

1. Producer of Recycled Water Title 22 Engineering Report: Prior to delivering the recycled water to first user, the City of Imperial as a producer shall submit to the Executive Officer of the Regional Board (RWQCB) and the State Water Board's Division of Drinking Water a Title 22 Engineering Report per Title 22, Division 4, Chapter 3, Article 7, California Code of Regulation. The report clearly shall describe the design and reliability features of the WWTP as specified in Articles 8, 9, and 10 of the regulations. This report addresses these requirements.
2. User/Distributor of Recycled Water Title 22 Engineering Report: Prior to delivering recycled water to the first user, the City of Imperial in conjunction with the user/distributor shall submit to the Executive Officer of the Regional Board (RWQCB) and the State Water Board's Division of Drinking Water a Title 22 Engineering Report containing the following information for review and approval:

    a. The average number of persons estimated to be served at each use site area on a daily basis.
    b. The specific boundaries of the proposed use site area including a map showing the location of each facility, drinking water fountains, and impoundments to be used.
    c. The person or persons responsible for the operation of the recycled water system at each use area.
    d. The specific use to be made of the recycled water at each use area.
    e. The methods to be used to assure that the installation and operation of the recycled system will not result in cross connections between the recycled water and potable

water piping systems. This should include a description of the pressure, dye or other test methods to be used to test the system.

f. Plans and specifications, which include the following:
   - Proposed piping system to be used
   - Pipe locations of both recycled and potable systems
   - Type and location of outlets and plumbing fixtures that will be accessible to the public.
   - The methods and devices to be used to prevent backflow of recycled water into the potable water system.
   - Plan notes relating to specific installation and user requirements.

This report addresses some of the distributor information required by Title 22 but does not include user information at this time.

WEBB/AQUA was retained by the City of Imperial to prepare a Title 22 Engineering Report for the production and distribution of recycled water at the City's wastewater treatment plant. An additional report will be required to further develop the potential uses and users of this water.

8.2 Proposed Users of Recycled Water

The City of Imperial will be the lead agency for the Water Recycling Title 22 Engineering Reports. The responsibilities of the producer and users of recycled water are described in this section and Table 8-1 of this report. The City of Imperial will supply recycled water from the Imperial WWTP to the following users:

1. ????: _____ and the City of Imperial will work together to provide recycled water to local customers. The City of Imperial is the NPDES permit holder, and _____ will serve as a master user/distributor of recycled water to its customers. _____ will be required to submit information about users as described in 8.1.B. to demonstrate compliance with Title 22.

8.3 Rules and Regulations Report for Recycled Water Use

As a producer of recycled water, the City of Imperial shall establish and enforce Rules and Regulations for Recycled Water Use. These regulations shall be submitted to the Executive Officer of the Regional Board (RWQCB), the State Water Board's Division of Drinking Water, and the Imperial County Environmental Health Department for approval prior to delivery of recycled water

to the first user. These rules and regulations will be included in the Users Recycled Water Title 22 Engineering Report. As a master user/distributor, _____ or any other user will be required to adopt and implement the rules and regulations on behalf of the City of Imperial. These rules and regulations will govern the design and construction of the recycled water use facilities and the use of the recycled water in accordance with Title 22 and the California Water Code. The use of the recycled water must also comply with the water reclamation plan specified in the Basin Plan and BPA maximum benefit commitments.

8.4 Inspections

Prior to the delivery of recycled water to the first user, the City of Imperial will develop a program to conduct compliance inspections of recycled water use sites. Inspections shall determine the status of compliance with the Discharge Rules and Regulations for Recycled Water Use. The City will review and update the inspection program as necessary with the addition of each user. As a producer of recycled water, the City of Imperial will conduct periodic inspections of the facilities of the recycled water users to monitor compliance by the users with this Order.

8.5 Responsibility of Producer & Users of Recycled Water

Table 8-1. Responsibility of Producer and Users of Recycled Water

	Responsible Party	Requirements of Order No. R7-2021-0002	Time of Delivery	Approval/Inspection Agency
1	Producer[1]	Prepare a Title 22 Engineering Report as a producer of recycled water	Prior to delivery of recycled water to its first user	CRWQCB-DDW[3], RWQCB[4]
2	User[1,2]	Prepare a Title 22 Engineering report for landscape irrigation.	Prior to delivery of recycled water to its first user.	CRWQCB-DDW[3], RWQCB[4]
3	Producer[1] & User[1,2]	Prepare Rules of Regulation for Recycled Water Use (governing the design, construction use facilities and use of recycled water)	Prior to delivery of recycled water to its first user.	CRWQCB-DDW[3], RWQCB[4]
4	Producer[1] & User[1,2]	Developing a program for compliance inspection of recycled water use sites.	Prior to delivery of recycled water to its first user.	City of Imperial
5	Producer[1]	Perform Inspections	Periodic inspections to monitor compliance by the users.	City of Imperial
6	User[1,2]	Informational Report including the following: number of users, boundaries, responsible parties, persons, use of recycled water, backflow prevention, cross connection, plans & specifications, etc.	Prior to delivery of recycled water to its first user.	CRWQCB-DDW[3], RWQCB[4], ICEHD[5]

[1]Producer: City of Imperial
[2]User:
[3]California Regional Water Quality Control Board, Division of Drinking Water (CRWQCB-DDW)
[4]Regional Water Quality Control Board (RWQCB)
[5]Imperial County Environmental Health Department (ICEHD)

CHAPTER 9 - CONCLUSIONS AND RECOMMENDATIONS

This Report has detailed how the City of Imperial WWTP intends to provide recycled water that complies with Title 22 Water Recycling Criteria. After completion of all upgrades, which are summarized in this Chapter, this report will be updated and resubmitted prior to delivery of recycled water to the first user.

9.1 Summary and Conclusions

This section summarizes the findings of the upgrades needed at the Imperial WWTP for compliance with Title 22 Water Recycling Criteria.

9.1.1 WWTP Process Capacity Summary

Detailed specifications and capability of the Imperial WWTP equipment are described in detail in Section 4 of this report and summarized below. Figure 9-1 contains the rated capacity of each treatment process. The WWTP capacity is based on the following criteria:

- Design criteria for the modified and expanded facilities; and
- Provision for redundant, standby or alternative equipment or treatment processes.

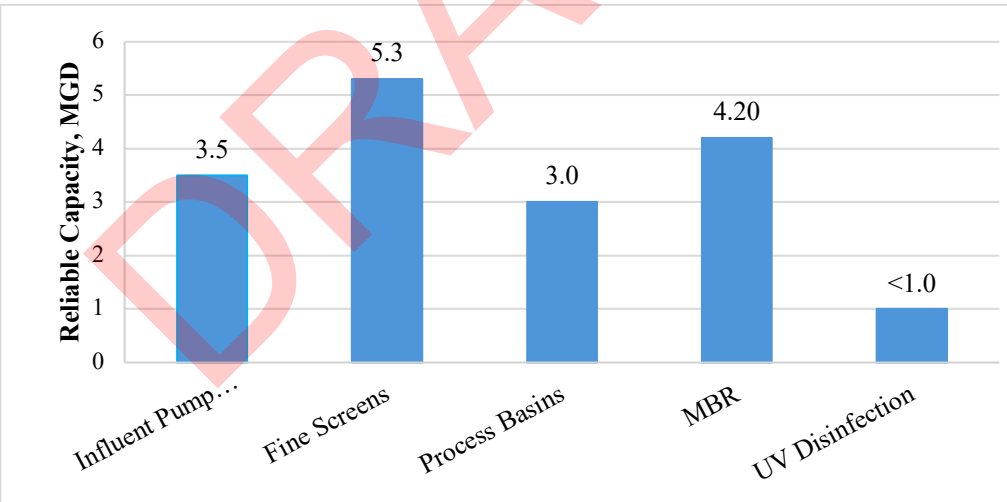

Figure 9-1. Imperial WWTP Process Capacity Summary

9.2 Necessary Plant Upgrades to Meet Title 22 Requirements

With the following upgrades, the Imperial WWTP will have the ability to reliably produce up to 3.0 mgd AADF of recycled water.

As indicated previously, the disinfection portion of the facility is the one process component needing improvement to reliably produce recycled water. An enclosed-vessel UV system was accounted for in the design of the MBR upgrade. Space for a three (3) unit system was included and could be utilized to provide UV disinfection meeting recycled water requirements. With current flow averaging 1.5 mgd and peak day flows of 1.6 mgd, the City could install a UV system to treat peak flows associated with an AADF of 1.6 mgd reliably, or whatever a different flowrate that meets the current recycled water demand, and then expand that system in the future. This will include the installation of a system in a two (2) duty, one (1) standby configuration in vessel UV system, to provide reliability for the system. Each vessel will be rated to treat 1.65 mgd. Validation of the system will also be required once it is installed along with submission of a validation report. Additional improvements will include a pumping and associated facilities described in 4.5.1.. The pumping system should be installed to include duty and standby pumps ensuring reliability of this process. Recycled water storage is not anticipated, beyond pump wet well requirements.