Heber Public Utility District
Wastewater Treatment Plant Expansion

Updated Preliminary Engineering Report
Submitted May 2008
THG Project No. 744.036E

Prepared by

THE HOLT GROUP, INC.

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1 EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Heber Public Utility District has experienced significant residential growth over the last five (5) years. The major highway network in the Heber area, readily available vacant land, the proximity of the Imperial Valley Mall and the southward spread of El Centro residential developments have contributed to increased population growth. These factors have contributed to the Townsite of Heber becoming an ideal location for residential growth. The 2000 U.S. Census listed the Heber population at 2,988 persons. It is anticipated the Heber population will increase to 6,816 persons by the end of 2008. It is estimated that the population will increase to a minimum of 10,440 persons by 2018.

It will be necessary to expand the Water and Sanitary Sewer infrastructure to meet the increased population demands. The Heber Public Utility District is planning to expand the Water Treatment Plant from 2 Million gallons per day to 6 Million gallons per day. The design of the Water Treatment Plant is under way. Per population projections listed in Section 3 of the report, it is anticipated the 6 Million gallon per day Water Treatment Plant will serve the water demands of the Heber Public Utility District until the year 2030.

The average daily flow currently entering the HPUD Wastewater Treatment Plant is approximately 650,000 gallons per day. The average gallons per capita per day (gpcd) flow rate of 100 gallons are used to tabulate the flows entering the Wastewater Treatment Plant. Table 6-2 of this report indicates that the average daily flow entering the Wastewater Treatment Plant at year end 2008 in anticipated at 681,000 gallons per day. It is proposed the HPUD Wastewater Treatment Plant be expanded to 1,200,000 gallons per day (1.2 MGD). It is anticipated the 1.2 MGD Wastewater Treatment Plant Expansion will provide an excess capacity of (1,200,000 gallons per day – 681,000 gallons per day) ÷ 400 gallons per day per equivalent dwelling unit = 1,300 equivalent dwelling units. According to Table 6-2 of this report, which indicates a growth rate of 3.21%, the

1.2 MGD Wastewater Treatment Plant expansion would serve the wastewater requirements of the Heber Public Utility District until 2022.

The NPDES Discharge Permit lists the rated capacity of the existing Heber Public Utility District Wastewater Treatment Plant at 0.81 MGD. An analysis conducted during the preparation of this report identified the raw wastewater influent BOD5 concentration to be 271 mg/L. The two (2) prior Wastewater Treatment Plant expansions were based on a combined BOD5 concentration level of 205 mg/L. The prior design BOD5 concentration level is 32 percent less than the actual concentration level. The analysis concluded that the existing Wastewater Treatment Plant capacity has been significantly reduced due to the increased wastewater strength. The waste activated sludge is accumulating in the system at a greater rate than it can be disposed. The treatment plant capacity is limited by: the oxidation ditches, oxidation ditch rotor aerators, secondary clarifiers and the solids (sludge) disposal system. As the Wastewater Treatment Plant stands, modifying the rotor units in the oxidation ditches, providing an alternative method of disposing of the waste activated sludge and constructing new secondary clarifiers will bring the existing oxidation ditches to 0.48 mgd average daily flow (annual basis). Table 6-2 of this report illustrates the Wastewater Treatment Plant will attain its permitted discharge capacity of 810,000 gallons per day in the year 2010.

Based on the projected flow increases it was determined that 1.2 mgd total plant capacity would be adequate to 2016. It was concluded that maximizing the use of the existing treatment units in the recommended plant expansion(s) would be the most cost effective method of any expansion.

The existing Wastewater Treatment Plant secondary treatment process uses oxidation ditches as the main method of wastewater treatment. Oxidation ditches are a proven process however they require a substantial amount of land due to their shallow water depth. Because the site area is limited, it is recommended

that a more conventional type activated sludge system, using the Integrated Fixed-film Activated Sludge (IFAS) / STM Aerotor (the same biological treatment process as the Oxidation ditches), be provided. The STM Aerotor process is a popular and a proven treatment method for smaller wastewater treatment facilities. It can easily be expanded in modular increments to accommodate flow increases as needed. The STM Aerotor process produces a high quality secondary effluent which consistently meets the NPDES discharge requirements of the Heber Public Utility District Wastewater Treatment Plant. The STM Aerotor process is very stable and operator friendly.

The California Regional Water Quality Control Board has imposed ammonia limits (in terms of total nitrogen) on Wastewater Treatment Plants in the Imperial County. The limit, set at 3.6 ppm, will be regulated as of 2010. It is anticipated that ammonia limits will be imposed on the Heber Public Utility District Wastewater Treatment Plant during the next expansion. The extended aeration process will be able to meet these stringent ammonia limits. In addition, the process can easily be modified in the future should actual nitrogen removal be required. Nitrogen removal can be accomplished by recycling a portion of the flow.

To augment solar drying beds, mechanical dewatering of the waste sludge is recommended. This will reduce the odor potential and free up a portion of the land now used by the sludge beds for other process purposes.

To reduce operator labor, improve treatment performance and reduce maintenance, fine screening and grit removal processes will be provided.
The next and subsequent Wastewater Treatment Plant expansions are recommended to continue the use of extended aeration reactors. The STM Aerotor, working in conjunction with the oxidation ditches, will provide the necessary treatment capacity.

The extended aeration reactors can create an anoxic zone to allow for the removal of total nitrogen and allow compliance with future NPDES Discharge Permit requirements as discussed above. The use of STM Aerotor as the main method of secondary treatment will maximize the amount of land space available for the 1.2 mgd expansion. The processes units for 1.2 mgd expansion can be constructed within the current 6.7 acre site.

It is recommended the existing emergency storage overflow basin be reduced in size within its existing footprint or moved east of the existing Wastewater Treatment Plant site. This will provide space for the new Headworks Building, new STM Aerotor system, new secondary clarifier to replace the 4 existing small, overloaded clarifiers serving the existing oxidation ditches. Heber Public Utility District owns the 14 acre parcel of land immediately east of and adjacent to the existing 6.7 acre Wastewater Treatment Plant for future expansions, if necessary. The 14 acre parcel of land would also provides a buffer space between the existing Wastewater Treatment Plant and the Heber Meadows Residential Subdivision. The 14 acre parcel of land may also be used to place a stormwater retention basin, if required by the County of Imperial Planning and Building Department.

The Heber Public Utility District Wastewater Treatment Plant Report reviewed the population growth and wastewater flow projections from 2005 through 2030. See Figure 6-2. Based upon the population and flow projections, Wastewater Treatment Plant expansions of 1.2 MGD, 2.0 MGD and 2.4 MGD are recommended from 2005 through 2030. The modular sizing of the STM Aerotor system may provide expansions in 0.80 MGD multiples, while eliminating the two existing oxidation ditches, 0.4 MGD total capacity, during the third phase. Eliminating the existing oxidation ditches, will free up land and retire aging equipment and concrete basins. Following is a table identifying the recommended treatment expansions between 2005 and 2030, using a growth rate projection of 3.21% after the year 2010:

Expansion Phase	Year Expansion Started	Year Expansion Placed on-line	Rated Capacity of Wastewater Plant Expansion	Total EDU's Based on Rated Capacity	Year Treatment Plant Reaches Capacity
1	2008	2010	1.2 MGD	3,000	2022
2	2019	2022	2.0 MGD	5,000	beyond 2030
3	To be determined	To be determined	To be determined	To be determined	To be determined

*Recommend Expansions between 2005 and 2030
*EDU's = Equivalent Dwelling Units
** This expansion could be 2.8 MGD or more depending on the growth rate

It is recommended that the Heber Public Utility District expand the Wastewater Treatment Plant to 1.2 MGD by continuing the use of the existing oxidation ditches and implementing an STM Aerotor process unit. The advantages are as follows:

- The majority of the existing treatment units can be maintained and incorporated within the Phase I and Phase II Wastewater Treatment Plant expansions. The major exceptions to this are a new clarifier for the oxidation ditches, rotor aerator modifications and replacement of sludge beds.
- It is more cost effective to maintain the existing treatment units as components of the new plant than to abandon them. The existing units are serviceable for some time into the future.
- The use of an STM Aerotor process is not as land intensive as continuing with additional oxidation ditches. With the exception of possibly constructing the emergency overflow basin on the Heber Public Utility District owned land east of the existing Wastewater Treatment Plant, the

Wastewater Treatment Plant units can be constructed on the existing 6.7 acre Heber Public Utility District Wastewater Treatment Plant site.

- The STM Aerotor system will assist in ammonia (Total ammonia as Nitrogen or NH_4-N) removal and can easily be adapted to provide nitrogen removal if necessary at some point in the future. It is expected the 1.2 MGD Discharge Permit will require ammonia removal to a maximum limit of 3.6 ppm per day.
- The STM Aerotor is a standard treatment system. STM Aerotor is a proven, reliable treatment method which consistently produces high quality effluent within stringent guidelines.
- The estimated cost for the expansion is $11,500,000.00 and includes engineering, environmental, permitting, construction phase engineering, start-up, operation and maintenance manual update.
- Because the existing oxidation ditch processes are nearly at their design capacity now, and design and construction of the expansion will take over 2 years, design of the expansion should begin as soon as possible.

2 INTRODUCTION

2.0 INTRODUCTION

Heber, California is an unincorporated rural area located approximately 5 miles north of the Mexican border. The location is displayed in Figure 2-1. The 2000 U.S. Census reported a population of 2,988. The current population is estimated at approximately 3,508 persons. The Heber Public Utility District (HPUD) is comprised of approximately 1,100 acres (1.7 square miles). The surrounding area consists primarily of large tracts of farmland. The HPUD Sphere of Influence encompasses approximately 7 square miles. The total HPUD Service Area consists of 8.7 square miles.

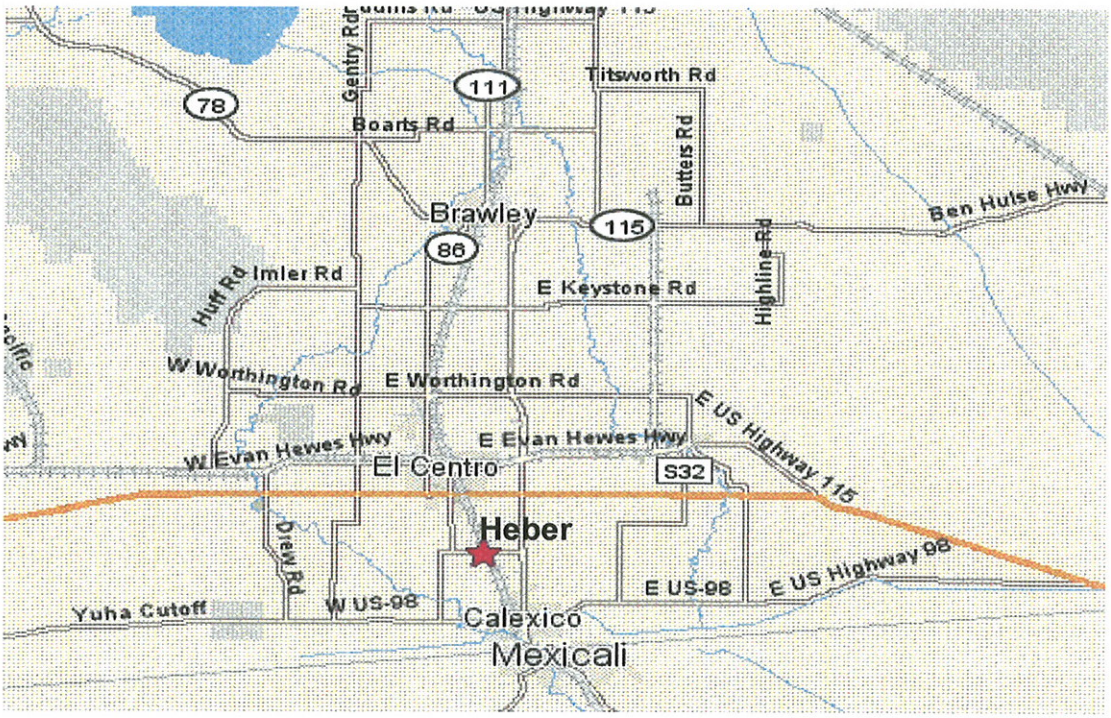


Figure 2-1

The Heber Public Utility District was formed in 1933 to provide domestic water and sanitary sewer services to the Heber Townsite. In the early 1960's, HPUD constructed a Wastewater Treatment Plant to accommodate the residences within the HPUD limits. In 1981 and 2000, the Wastewater Treatment Plant was expanded and upgraded to meet increased demands and attain compliance with

the National Pollutant Discharge Elimination System (NPDES) Permit (No. CA0104370).

The Wastewater Treatment Plant was last upgraded in 2000 to treat 0.81 million gallons per day (mgd) of wastewater for the Heber Public Utility District. However, as it will be discussed later, changes in the influent characteristics, since the plant was expanded in 2000, have changed significantly and the actual plant capacity (based on the capacity of the existing oxidation ditches) is 0.48 mgd average daily flow. Refer to Section 7.3.1 for an analysis.

Accordingly to HPUD's existing NPDES Permit, "The Facility expects to be at 80% of current flow capacity by December 2006. As such, the Discharger plans to expand the current Facility during the term of this Order. Completion of the expansion is tentatively set for June of 2008". Therefore, this Preliminary Engineering Report for the expansion of the existing Wastewater Treatment Plant is being prepared to meet the NPDES Permit requirements. In October 2006, The Holt Group, Inc. completed a Preliminary Engineering Report for the expansion of the Heber Public Utility District Wastewater Treatment Plant, per HPUD's authorization. The preparation of the Revised Preliminary Engineering Report is a necessary step to meet HPUD's certification from the Border Environment Cooperation Commission (BECC) requirements.

Based on data provided by HPUD, the current average daily flows at the Wastewater Treatment Plant range from 0.34 mgd to 0.56 mgd, with an average of 0.48 mgd. With the number of residential housing units constructed, HPUD has and will continue to experience a significant increase in wastewater flows. To keep pace with the increased wastewater flow, HPUD is exploring the expansion of the Wastewater Treatment Plant from the stated current capacity of 0.81 mgd (0.48 mgd actual) to a capacity that will accommodate expected growth within a timeframe of 10 to 15 years.

During the preparation of the Revised Preliminary Engineering Report, the operational characteristics of the existing oxidation ditches were evaluated. Section 7.3.1 fully describes the existing conditions and demonstrates the inadequacy of the existing oxidation ditches. The existing oxidation ditches are currently performing below the stated design capacities. The interpolation of the results is shown in Table 7-4. The results indicate that the existing oxidation ditches are capable of accommodating an average annual flow of 0.48 mgd, not the stated design capacity of 0.81 mgd. Given the likelihood that new residential development will cause the Wastewater Treatment Plant to exceed 80 percent in the near future, it is critical for HPUD to evaluate its options and implement a preferred alternative to expand its Wastewater Treatment Plant Facilities.

HPUD has expressed strong interest in completing the recommended Wastewater Treatment Plant Facility expansion within the existing plant site. The Revised Preliminary Engineering Report will evaluate alternatives that allow for expansion to occur within the current Wastewater Treatment Plant boundaries. However, it may be necessary for HPUD to obtain additional land for the construction of additional sludge drying beds.

3 BACKROUND INFORMATION

3.0 BACKGROUND INFORMATION

3.1 Site Location/Size

The HPUD Wastewater Treatment Plant is located at 1184 Rockwood Avenue in Heber, California at the southeast intersection of Correll Road and Rockwood Avenue. The site is bordered on the east by vacant private property (previously farmland as shown in Figure 3-1 below), on the west by Rockwood Avenue, on the north by Correll Road and on the south by a local concrete supplier, Gibson & Schaefer (not shown). Figure 3-1 illustrates the existing HPUD Wastewater Treatment Plant.

Figure 3-1

The Wastewater Treatment Plant site encompasses approximately 6.7 acres. Portions of the Wastewater Treatment Plant site currently dedicated for equipment and material storage and an overflow pond may be areas used for the future expansion of the Wastewater Treatment Plant.

3.2 Process Flow

Raw wastewater enters the HPUD Wastewater Treatment Facility, first passing through parallel grinders (Channel Monsters) and then through a Parshall Flume for flow measurement. The Channel Monsters grind up materials in the raw wastewater, however the Channel Monsters do not remove the materials from the raw wastewater. The Channel Monsters inability to remove the solids has an effect on the Plant's downstream processes.

To address the removal of solids, HPUD Plant Operators have implemented a number of strategies. Plant Operators installed a manually cleaned screen to attempt to capture some of the ground solids. This particular approach has met with mixed success. A limited amount of ground solids are removed. Plant Operators have implemented a second method for capturing solids. A "rock trap" has been placed upstream of the Parshall Flume. Although only marginally effective in removing grit, the "rock trap" is designed to capture heavy, readily settleable grit. The metered wastewater then flows into the influent pump station.

The influent pump station consists of four (4) submersible sewage pumps operating in pairs. One pair of pumps discharge to the oxidation ditch built in the 2000 expansion. The second pair of pumps discharge to the oxidation ditch built in the 1981 expansion. A "cross-over pipe" allows each pump pair to discharge to either oxidation ditch in an emergency. Raw wastewater entering the oxidation ditches is blended with mixed liquor. Mixed liquor is the mixture of raw or settled wastewater and activated sludge contained in the oxidation ditch.

The oxidation ditch is a continuous, loop reactor in a "racetrack" configuration. Oxygen is supplied by horizontal brush rotor aerators, two of which are present in each oxidation ditch. The brush rotor aerators provide the energy to generate movement of the liquid in the reactors. The mixed liquor flows over an adjustable weir gate into the secondary clarifiers.

Two (2) secondary clarifiers are located downstream of each oxidation ditch. The suspended solids in the mixed liquor are separated from the liquid in the secondary clarifiers. The mixed liquor suspended solids settle to the bottom of the clarifiers. The clarified liquid exits over the peripheral weir, and flows to a chlorine contact channel. Chlorine, in the form of gas dissolved in water, is added at the upstream section of the chlorine contact channel to allow disinfection to take place in the channel. Prior to the discharge of the disinfected effluent, the effluent is dechlorinated with sulfur dioxide gas dissolved in water. The effluent is then discharged to the Imperial Irrigation District Central 3-D No. 1 Drain.

Suspended solids which settle in the secondary clarifiers are pumped back to the oxidation ditch by the return activated sludge (RAS) pumps. In the wastewater treatment process, suspended solids are produced and periodically removed, or "wasted", to maintain the balance within the oxidation ditch. The amount of suspended solids wasted depends on the characteristics of the influent wastewater and the operational parameters of the process. The solids produced by the HPUD Wastewater Treatment Plant are wasted to sludge drying beds (also referred to as solar drying beds) by opening a manual valve on the return sludge line.

The HPUD Wastewater Treatment Plant has two (2) types of sludge drying beds: concrete-lined with a center drainage strip constructed in the 1981 expansion and sand-lined drying beds constructed in 2000. The water in the sludge, which is wasted to the drying beds, drains off slowly. The drainage water flows back to

the influent sewage pump station. The bulk of the water evaporates within the drying beds which is a slow and inefficient process, particularly in cooler temperatures. One of the major problems observed at the HPUD Wastewater Treatment Plant is the inability to waste and dewater solids.

3.3 Populations - Present and Future

Several factors have contributed to rapid residential growth in Imperial Valley and in the Townsite of Heber in particular. Heber is immediately south of the recently constructed Imperial Valley Mall. Additional high end commercial and business development is planned in the immediate vicinity of the Imperial Valley Mall. Coupled with commercial development is the sprawl of neighboring El Centro's residential development, reaching toward the southern boundary of the City of El Centro where El Centro meets Heber. The Heber Public Utility District Service Area is comprised of relatively large tracts of vacant, affordable farmland that has captured the market interest of residential homebuilders. The HPUD is adjacent to and/or intersected by several major arterial roadways, including Highway 86, Highway 111, Interstate 8 and Dogwood Road. Accessibility to major highways makes Heber an attractive location for residential, commercial and industrial development. As a result, Heber has been viewed and continues to be an ideal location for growth.

From 1990 to 2000, the official population of the Townsite of Heber increased from 2,566 persons to 2,988 persons, resulting in a net increase of 422 persons (per the U.S. Census Bureau). The increase in population from 1990 to 2000 represents a percentage increase in population of 1.6 percent (422 persons / 2,566 persons x 100% / 10 years) for each year between 1990 and 2000.

By year end 2005, the Heber Public Utility District provided residential wastewater services to a total of 818 single-family residences and 59 multi-family residences (see Appendix "A"). Based upon an average household size of 4 persons per dwelling unit (as recommended by the County of Imperial Planning &

Development Services Department), the projected population is 3,508 persons (877 residential units x 4 persons per residential unit). From 2000 to 2005, the population of Heber increased from 2,988 persons to 3,508 persons for a net increase of 520 persons. The increase in population from the year 2000 to 2005 represents a growth rate of 3.21 percent.

Table 3-1 (below) summarizes anticipated residential development within the Heber Public Utility District in 2006. The middle column identifies the number of residential units that HPUD is obligated to serve as evidenced by HPUD issued letters of commitment. The last column lists the estimated number of residential units likely to be constructed by year end 2006 based on HPUD's knowledge of the various developments' construction schedules. It was anticipated that 512 residential units were constructed within the Heber Public Utility District Service Area by the end of 2006. Based upon an average household size of 4 persons per dwelling unit, the population increased 2,048 persons (512 residential units x 4 persons per residential unit). The increase in residential development resulted in a population of 5,556 persons (3,508 persons + 2,048 persons) by the end of 2006. This increase in population represented a growth of 58.4 percent (2,048 persons / 3,508 persons x 100%) growth for the year 2006.

Project Name	HPUD Commitments to Serve	Projected Residential Units
McCabe Ranch	307	200
Heberwood Estates	508	176
Desert Sunrise Apts.	24	24
Heber Meadows	219	112
TOTAL	**1,058**	**512**

Table 3-1: Anticipated Residential Development for Heber Townsite by 2006

Table 3-2 summarized the number of residential dwelling units that will be constructed within the Heber Public Utility District Service Area between 2007 and the end of 2010. A total of 630 residential units are anticipated for

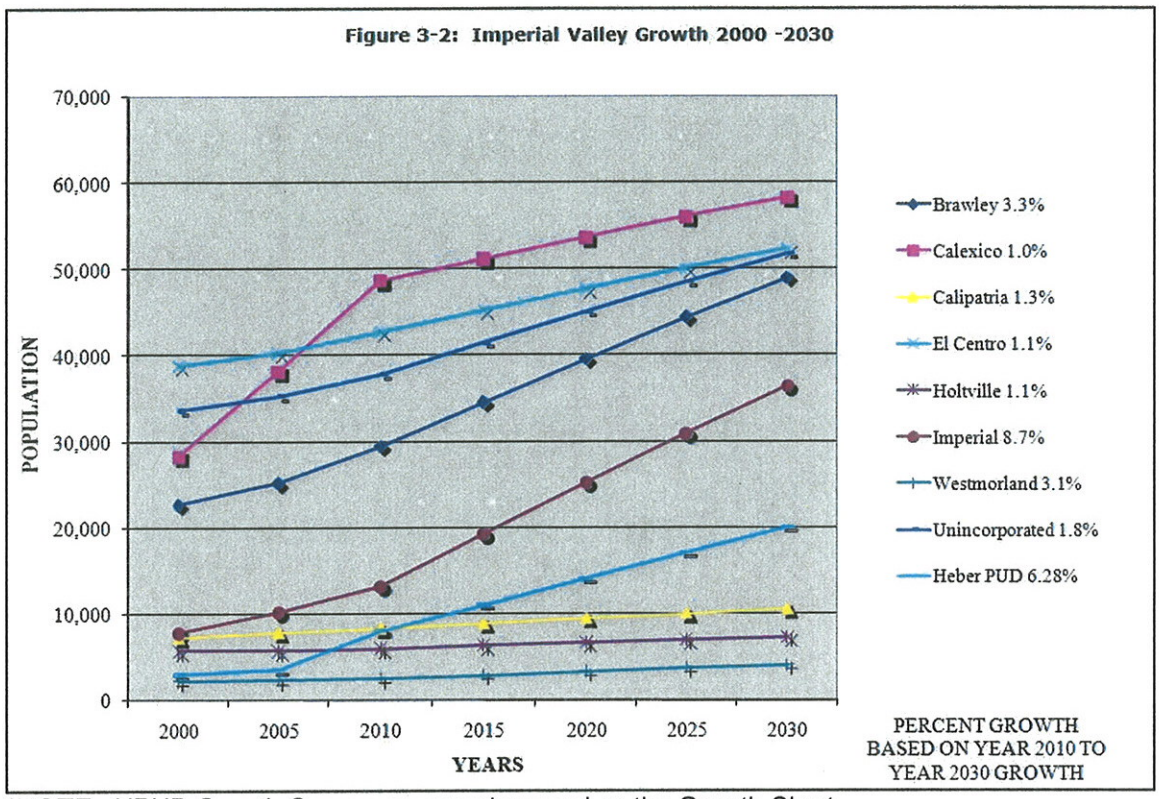
development. Based upon an average person per dwelling unit figure of 4 persons per dwelling unit, the projected increase in population will be 2,520 persons (630 residential units x 4 persons per residential unit). The increase in residential development will result in a population of 8,076 persons (5,556 persons + 2,520 persons) by the end of 2010. The increase represents a growth rate of 9.35 percent for the years between 2007 and 2010.

Project Name	HPUD Commitments to Serve	Projected Residential Units
McCabe Ranch	127	127
Heberwood Estates	612	388
Heber Meadows	107	107
Appaloosa Estates	8	8
TOTAL	**854**	**630**

Table 3-2: Anticipated Residential Development for Heber Townsite 2007 through 2010

The population growth based upon the number of residential housing units to be constructed within the three and one-half (3 1/2) years is predictable within an acceptable degree of accuracy given the new subdivisions currently under construction. Predicting the population growth accurately beyond 2010 based upon the known subdivisions or a known commercial, industrial or institutional development is not possible. In order to predict population growth beyond 2010, a different population growth forecast method is required.

Beyond 2010, estimation of future population growth within the HPUD Service Area was based on the analysis of past trends, as well as growth projections developed by the Southern California Association of Governments (SCAG). SCAG provides the most current population growth trends within Imperial County. SCAG has developed the population projections presented in Figure 3-2.



*NOTE: HPUD Growth Curve was superimposed on the Growth Chart

Heber population figures were graphed beyond the year 2010 based on past and present Heber Public Utility District growth projections. The tabulated and graphed population projections are illustrated in Figure 3-3 and Table 3-3. The population growth projections for the purposes of this document will be 6.28 percent. The 6.28 percent growth is derived from the average of 3.21 percent (achieved between the years 2000 to 2005) and 9.35 percent (forecast between the years 2007 and 2010).

Figure 3-3: Projected Population Growth for Heber Townsite

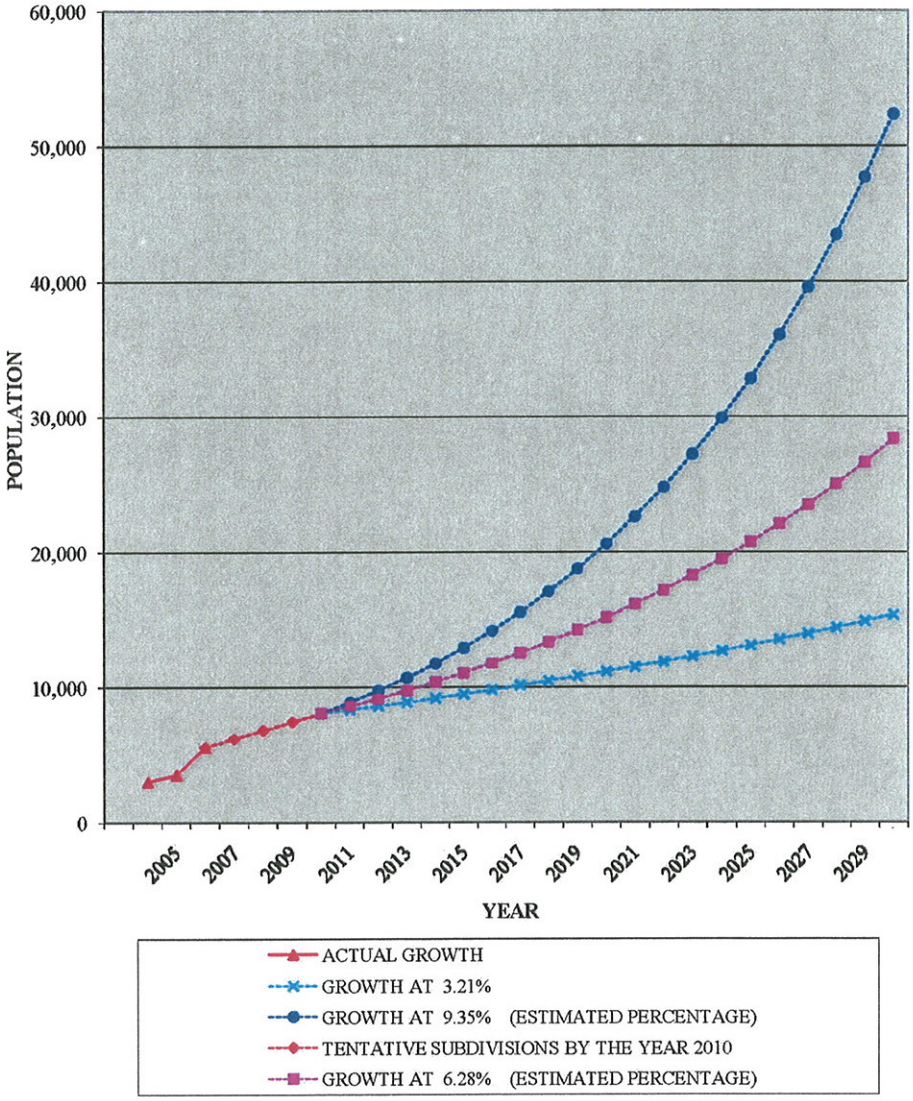


Table 3-3: Projected Population Growth for Heber Townsite

ACTUAL GROWTH		TENTATIVE SUBDIVISIONS BY THE YEAR 2010		GROWTH AT 3.21%		GROWTH AT 9.35% (ESTIMATED PERCENTAGE)		GROWTH AT 6.28% (ESTIMATED PERCENTAGE)	
YEAR	POP.	YEAR	POP.	YEAR	POP.	YEAR	POP.	YEAR	POP.
2000	2,988								
2005	3,508								
2006	5,556	2006	5,556						
		2007	6,186						
		2008	6,816						
		2009	7,446						
		2010	8,076	2010	8,076	2010	8,076	2010	8,076
				2011	8,339	2011	8,868	2011	8,599
				2012	8,611	2012	9,737	2012	9,157
				2013	8,892	2013	10,691	2013	9,750
				2014	9,182	2014	11,739	2014	10,382
				2015	9,481	2015	12,890	2015	11,055
				2016	9,791	2016	14,153	2016	11,772
				2017	10,110	2017	15,540	2017	12,535
				2018	10,440	2018	17,063	2018	13,347
				2019	10,780	2019	18,736	2019	14,212
				2020	11,132	2020	20,572	2020	15,133
				2021	11,495	2021	22,589	2021	16,114
				2022	11,869	2022	24,803	2022	17,159
				2023	12,256	2023	27,234	2023	18,271
				2024	12,656	2024	29,903	2024	19,455
				2025	13,069	2025	32,834	2025	20,716
				2026	13,495	2026	36,052	2026	22,058
				2027	13,935	2027	39,586	2027	23,488
				2028	14,389	2028	43,466	2028	25,011
				2029	14,859	2029	47,726	2029	26,632
				2030	15,343	2030	52,404	2030	28,358
Column is based on actual growth from 2000 to 2005 and projection of 2006 growth		Column is based on 2,520 committed services that are to be served in near future		Column is based on 3.21 percent growth from 2000 to 2005		Column is based on 9.35 percent growth from 2006 to 2010 projections		Column is based on average (6.28%) averaging the 9.35 percent and 3.21 percent growth	

4 PROJECT DESCRIPTION/OBJECTIVES

4.0 PROJECT DESCRIPTION/OBJECTIVES

The intent of this report is to prepare for the Heber Public Utility District Wastewater Treatment Plant expansion. Rapid residential growth over the last few years and the newly adopted NPDES permit have required the preparation of the Wastewater Treatment Plant Preliminary Engineer Report.

HPUD is experiencing increased wastewater flows from newly constructed residential developments. The maximum daily wastewater flow is approaching the Wastewater Treatment Plant's rated capacity per the recently approved NPDES Discharge Permit. The rated capacity of the HPUD Wastewater Treatment Plant is 0.81 million gallons per day (mgd). Due to the limitations of the existing oxidation ditches, the Plant is capable of treating an average daily flow of 0.48 mgd (0.55 mgd on a maximum monthly flow basis). The current average daily flows range between 0.34 and 0.56 million gallons per day mgd. The maximum daily flow (over a 24-hour period) is 0.81 mgd.

HPUD recently constructed a regional wastewater pump station to accept wastewater flows from present and future developments within the HPUD Service Area. The pump station is initially equipped with 500 gpm (0.72 mgd) variable speed pumps. The pump station has the flexibility of allowing pumps with larger capacities to be installed as wastewater flows increase. The maximum capacity of the pump station is 3,000 gpm (4.32 mgd) average daily flow.

The Regional Water Quality Control Board, Colorado River Basin Region (Regional Board) adopted a new National Pollutant Discharge Elimination System (NPDES) Permit on June 21, 2006. The revised NPDES Permit identifies the occurrence of certain substances in the HPUD effluent. Currently, these substances do not comply with the limits established in the Environmental

Protection Agency's California Toxic Rule (CTR). The standards and concerns will be reviewed in detail with the contents of this report.

The objectives of the report are as follows:

1. To assess the condition and capacity of the existing Wastewater Treatment Plant Facility. To identify Wastewater Treatment Plant components which are deficient and require rehabilitation or replacement.

2. To explore the expansion of the Wastewater Treatment Plant based upon capacity, considering the integration of the existing treatment units, capital cost, effluent quality, process reliability and ease of operation and maintenance.

3. To recommend the most viable expansion (as noted in the Appendix "C", Alternative Analysis Addendum), including the capacity of the expanded Wastewater Treatment Plant, excess capacity of the Wastewater Treatment Plant and costs associated with the expansion to meet the projected flow demands through phased expansions. To meet the newly implemented NPDES permit requirements.

5 PROJECT REQUIREMENTS/STANDARDS

5.0 PROJECT REQUIREMENTS/STANDARDS

5.1 Local Flood Levels

The Wastewater Treatment Plant is located in the Federal Emergency Management Agency (FEMA) designated Zone C, an Area of Minimal Flooding. According to the FEMA Flood Insurance Rate Maps for Imperial County, California, the Wastewater Treatment Plant is not located within a 100-year flood plain zone.

5.2 Codes and Permits

The Wastewater Treatment Plant is currently permitted under the California Regional Water Quality Control Board's National Pollutant Discharge Elimination System (NPDES). The current HPUD NPDES Permit Number is CA0104370 under Board Order Number R7-2006-0049 adopted June 21, 2006 (see Appendix "B").

5.3 Soil Reports

A geotechnical (soils) report was prepared after the completion of the Preliminary Engineering Report Dated October 2006. The Geotechnical Report was completed in May 2008.

5.4 Utilities (Power, Gas, Etc.)

The following utilities service the Wastewater Treatment Plant site:

- Imperial Irrigation District - Power Division
  1699 West Main Street, Suite A, El Centro, CA 92243
  Alfred Ornelas - (760) 482-3408

- Imperial Irrigation District - Water Division
  333 East Barioni Boulevard, Imperial, CA 92251
  John Kilps - (760) 339-9260

- AT&T Telephone
  1029 South Second Street, El Centro, CA 92243
  Mike Ormand - (760) 337-3358

- Southern California Gas Company - (Local Office)
  970 North Fourth Street, El Centro, CA 92243
  Jimmie Rodriguez - (760) 352-6100

- Southern California Gas Company – (SCGC Planning Office)
  1981 West Lugonia Avenue, Redlands, CA 92373
  Dean Lewis - (909) 335-7508

- Time Warner Cable
  313 North Eighth Street, El Centro, CA 92243
  Keith Johnson - (760) 352-8835

- Underground Service Alert
  811

- Ormat Nevada Inc. (Geothermal)
  855 Dogwood Road, Heber, CA 92249
  Larry Riehle - (760) 337-8872 Ext. 427

Existing above-ground utilities, such as telephone lines, power lines, cable lines and junction boxes are visible within and adjacent to the Wastewater Treatment Plant site. The existing utilities provide service to the adjacent residences, commercial buildings and the HPUD Wastewater Treatment Plant. All utility entities will be contacted regarding the actual location of their respective utility lines and appurtenances during the design and construction phases of the Wastewater Treatment Plant expansion. Prior to construction, Underground Service Alert (Phone Number: 811) shall determine the exact location of existing utilities.

5.5 Discharge Regulatory Constraints

This section discusses the discharge regulatory constraints that affect the design for the expansion of the HPUD Wastewater Treatment Facility. Of particular

importance are the following documents issued by the California Environmental Protection Agency:

- NPDES Permit CA0104370 Adopted June 21, 2006
- California Toxics Rule (CTR) and the State Implementation Plan (SIP)
- Chlorine Residual Policy (Draft)

5.5.1 NPDES Permit

The current National Pollutant Discharge Permit (NPDES) Permit was adopted on June 21, 2006. RWQCB Order Number R7-2006-0049 (CA0104370) maintains the previous discharge flow limitation of 0.81 mgd, but revises various discharge limits. The Permit is valid for five (5) years or until the RWQCB reopens the Permit. The effluent limitations at the discharge of the plant allowed under RWQCB Order No. R7-2006-0049 (CA0104370) are summarized in Table 5-1.

Table 5-1: HPUD NPDES Permit Summary

Parameter	Units	Discharge Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD5	mg/L	30	45			
	lb/d	200	300			
TSS	mg/L	30	45			
	lb/d	200	300			
pH					6.0	9.0
Daily Effluent Flow	mgd	0.81				
Chlorine, Total Residual	mg/L	0.01				0.02
	lb/d	0.07				0.14
Lead, Total Recoverable	µg/L	7.0		14		
	lb/d	0.047		0.095		
Zinc, Total Recoverable	µg/L	47		95		
	lb/d	0.32		0.64		
Copper, Total Recoverable	µg/L	2.9		5.8		
	lb/d	0.02		0.039		
Free Cyanide	µg/L	4.3		8.5		
	lb/d	0.029		0.057		

NOTE: The copper, lead, zinc and cyanide limits listed above are not applicable until May 18, 2010. Interim limits have been established for copper, lead, zinc and cyanide from the time period of the Discharge Permit issuance on June 21, 2006 to May 18, 2010.

Effluent discharged to the Central Drain 3D No. 1 shall not exceed an E. coli concentration in excess of the log mean of most probable number (MPN) of 126/100mL based on not less than five (5) samples for any 30-day period nor shall any sample exceed 400/100mL.

If HPUD increases the Plant's capacity above a 0.81 mgd average daily flow or significantly modifies the wastewater treatment process, a new or amended NPDES Permit shall be required. Given the likelihood that HPUD will pursue expansion, it is recommended that a number of findings contained in Order Number R7-2006-0049 be fully considered in the site planning and expansion of the HPUD Wastewater Treatment Plant.

The HPUD Wastewater Treatment Plant discharges treated wastewater to the Central Drain 3-D No. 1. Central Drain 3D No. 1 is part of the Imperial Valley Irrigation District System drainage network. Imperial Irrigation District drains are on the EPA 303(d) list of impaired waters. The drains are impaired by sediments, silt, pesticides and selenium. The Central Drain 3-D No. 1 discharges to the Alamo River, which has an approved Total Maximum Daily Load (TMDL) for sedimentation/siltation and an established wasteload allocation for sediment.

Tributaries to the Salton Sea, including the Alamo River, may be affected by future TMDLs. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Section 303(d) of the 2004 State Clean Water Act lists the Salton Sea as a water body impaired by nutrients.

No TMDL has been established by the Regional Water Quality Board for the Salton Sea to date. However, a nutrient TMDL is under development for the Salton Sea that may adversely restrict permitted discharges to tributaries of the Salton Sea, including the Alamo River. The TMDL is tentatively scheduled for

completion in 2009. The likely impact of a TMDL is that nitrogen removal and, perhaps phosphorus removal, may be required in the future. The Wastewater Treatment Plant Preliminary Engineering Report has assumed that nitrogen removal will be required for the HPUD Wastewater Treatment Plant.

There are both interim and final limits placed on copper, lead, zinc and cyanide as illustrated Table 5-1. The interim and final limits shall be discussed along with the California Toxics Rule (CTR) and State Implementation Plan (SIP) in Section 5.5.2.

RWQCB Order No. R7-2006-0049 (CA0104370) adopted on June 21, 2006 requires the following special studies be completed by HPUD within the identified timeframes:

- Toxicity Reduction Evaluation (TRE) Work Plan - September 2006. The TRE Work Plan has been addressed and is currently being coordinated with the CRWQCB.
- Translator Study - June 2008
- Anti-Degradation Analysis and Engineering Report for the Wastewater Treatment Plant Expansion.
- Operations Plan for the new expansion, including start-up activities and preventative measures due at least 30 days prior to start up.
- Total Dissolved Solids (TDS) Study to determine the practicality of the 400 mg/L TDS incremental increase above the source water – June 2011
- Lead and Zinc Infeasibility Report – July 2006. The Lead and Zinc Infeasibility Report has been addressed and is currently being coordinated with the CRWQCB.
- Work Plan for Total Chlorine Residual Compliance – July 2006. The Work Plan for Total Chlorine Residual Compliance has been addressed with the CRWQCB.
- Revised Spill Response Plan, if needed, August 2006. The Revised Spill Response Plan has been addressed with the CRWQCB.

- Sludge Disposal Plan.
- Compliance Plan to reduce concentrations of copper, lead, zinc and cyanide - June 21, 2007. The Compliance Plan has been addressed and is currently being coordinated with the CRWQCB.

5.5.2 California Toxics Rule, National Toxics Rule and State Implementation Plan

The California Toxics Rule (CTR), National Toxics Rule (NTR) and State Implementation Plan (SIP) shall be considered in the planning and design stages of the HPUD Wastewater Treatment Plant expansion project. The federal toxics standards, referred to as the NTR, were promulgated by the U.S. Environmental Protection Agency in 1992 and amended in 1995. The CTR criteria supplement the NTR. The CTR presents the federal criterion, in addition to 23 aquatic life priority pollutants and 57 human health priority pollutants, in a tabular form. The criterion in the NTR and CTR were established to protect aquatic life and human health. The SIP, also known as the "Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California - - 2005" established criteria for toxics within the California Toxics Rule policy. The limit for these pollutants is very low and in many cases well below the drinking water Maximum Contaminant Level (MCL).

As stated above there are water quality criteria for freshwater, saltwater and human health. Freshwater criteria applies if the salinity is equal to or less than 1 part per thousand 95% of the time. If the salinity is greater than 10 parts per thousand 95% of the time, the saltwater criteria shall apply. If it is between 1 and 10 parts per 1000, then the more stringent criteria shall apply unless a scientifically defensible study which evaluates the biology can be provided which supports either one or the other. For the "human health" category, if the water has a designated beneficial use as municipal drinking water supply (MUN), then

the water and organism limits apply. If the water does not have a municipal drinking water beneficial use, then the organisms only applies.

The priority pollutants concentration limits are further categorized as the "freshwater maximum", "freshwater continuous", "saltwater maximum", "saltwater continuous". The Criteria Maximum Concentration (CMC) is the maximum concentration the organism can be exposed to for a short period of time without deleterious effects. The Criteria Continuous Concentration (CCC) is the maximum concentration the organism can be exposed to for an extended period of time (4 days) without deleterious effects.

The limits which are published in the CTR must be adjusted for specific water quality criteria, such as hardness, pH, etc. The limits established by the Regional Board are included in RWQCB Order No. R7-2006-0049 (CA0104370) and were presented previously in Table 5-1. Sampling data for the First Quarter 2006 showed copper at 11 µg/L, lead at 16 µg/L, zinc at 26 µg/L and cyanide less than 20 µg/L. Sampling of the effluent in May 2001 indicated copper at 21 µg/L, lead at 4 µg/L, zinc at 49 µg/L and cyanide at 10 µg/L. These values are well above the NPDES limits established after May 18, 2010.

The Regional Board has established interim limits for copper, lead, zinc, and cyanide as follows:

Table 5-2 Interim Effluent Discharge Limits

Parameter	Units	Interim Effluent Limitations	
		Average Monthly	Maximum Daily
Copper, Total Recoverable	µg/L	21	21
	lb/d	0.14	0.14
Lead, Total Recoverable	µg/L	16	16
	lb/d	0.11	0.11
Zinc, Total Recoverable	µg/L	280	280
	lb/d	1.9	1.9
Free Cyanide	µg/L	10	10
	lb/d	0.068	0.068

The interim limits apply until May 18, 2010. Based on the limited sampling data for Heber, except for zinc and possibly lead, compliance with even the interim limits may be difficult to achieve.

5.5.3 Chlorine Residual Policy

The "Total Residual Chorine and Chlorine-Produced Oxidants Policy of California" is in draft form as of this date. The Policy establishes limits on the total residual chlorine. The limits for Total Residual Chlorine (TRC) are 19 µg/L as a 1 hour average and 11 µg/L as a 4-day average. On-line recorders must be capable of reading to 10 parts per billion (ppb). The policy may impact the HPUD Wastewater Treatment Plant in the future.

It is important to note that there are limits stated in the current draft of the Chlorine Residual Policy. To ensure compliance with the policy, careful monitoring of the dechlorination system will be necessary.

5.5.4 Nutrients

The RWQCB Order No. R7-2006-0049 (CA0104370) indicated there is a nutrient Total Maximum Daily Limitation (TMDL) being developed for the Salton Sea and its tributaries. It is not known when this will become enforceable, but prudent planning should consider the future need to remove nitrogen to a level of between 6 and 8 mg/L as total inorganic nitrogen (TIN). Nitrogen removal shall be accomplished by designing an anoxic zone for nitrogen removal in the activated sludge reactor. Achieving a TIN in the range of 6 to 8 mg/L is achievable in a well designed and well operated treatment facility.

There is a remote possibility that a limit may be placed on phosphorus. Typically, saline waters are not phosphorus limited. Nitrogen is usually the controlling

nutrient. Biological phosphorus removal to an effluent concentration of 2 mg/L of total phosphorus is achievable by the installation of an anaerobic reactor in the initial stage of the treatment process. Typical hydraulic retention times are in the order of 1 to 2 hours.

5.5.5 Title 22 Water Reclamation and Reuse

In the future, it may be desirable to reclaim and reuse all or a portion of the treated effluent for landscape irrigation and other uses. The Wastewater Treatment Plant will be required to comply with Title 22 regulations, which require chemical coagulation, flocculation, filtration and disinfection. The disinfection requires the most probable number (MPN) of total coliform not exceed 2.2/100 mL based on the median of the last 7 days of analyses or 23/100 mL in any one sample over the last 30 days. No sample shall be over 240/100 mL. The chlorine contact tank shall be designed for a modal contact time of 90 minutes and the contact time (CT) shall be at least 450 mg-min/L at peak flow. This is achievable by designing the chlorine contact tank for two hours of hydraulic retention time and a length to width or depth ratio of at least 40:1; The greater the length to width or depth ratio the better. If UV disinfection is used, the disinfection system shall comply with the National Water Research Institute design guidelines.

It is recommended water reclamation and reuse not be considered for the upcoming expansion. It is recommended water reclamation be considered during future expansions. Unless the effluent limits for discharge to the Imperial Irrigation District Central Drain 3-D No. 1 change and require filtration and equivalent Title 22 effluent requirements, a separate, side stream tertiary process is recommended for future reclaimed water facilities. The tertiary system would consist of a secondary effluent pump station to lift the effluent to the tertiary process where chemical coagulant injection, short retention time flocculation and

tertiary filtration would be provided. A separate disinfection system would be provided since the requirements for Title 22 are more stringent than those for discharge to the Imperial Irrigation District Central Drain 3-D No. 1. An effluent pump station shall be required to lift the effluent into the recycled water distribution system. Provision for recycled water on-site storage should be planned. There are a number of approved alternative technologies for filtration, including cloth media filters which have a smaller footprint than the conventional sand or anthracite media filters.

6 WASTEWATER FLOWS AND CONSTITUENT CHARACTERISTICS

6.0 WASTEWATER FLOWS AND CONSTITUENT CHARACTERISTICS

Data for influent and effluent characteristics and effluent flow discharged to the Imperial Irrigation District Central Drain 3-D No. 1, taken weekly and reported to the Regional Board for the period January 2004 through December 2005 were analyzed. The results are summarized in the following paragraphs.

6.1 Existing Wastewater Flows

The average flow for 2004 and 2005 was 0.339 and 0.337 mgd respectively. The flow rate did not change significantly when annual averages are considered. The population in the service area in 2005 was estimated to be 3,508. The flows and population figures can be used to calculate a 96.1 per capita per day flow (gpcd) figure. This value is slightly higher than considered "typical" for residential communities. Multiple families or extended families residing in a single dwelling unit could account for the greater than normal gpcd figure.

On February 18, 2004, the maximum 24-hour flow rate was measured at 0.443 mgd. The ratio of the maximum daily flow to the average daily flow was determined to be 1.3:1.

Peak flows were not analyzed. A peaking formula used by a number of governmental agencies in Southern California was used to estimate the peak flow. The formula is:

$$Q_{peak} = 1.84 * (Q_{ave})^{0.92}$$ where Q is in cubic feet per second, cfs

For the current average daily flows of 0.34 mgd, the peak flow is determined to be 0.66 mgd. The ratio of Q_{peak}/Q_{ave} = 1.94:1

6.2 Projected Wastewater Flows

The population projections for HPUD were presented previously. Wastewater flows from 2005 to 2030 were projected using the population data and are presented in Table 6-1 and Table 6-2. The average per capita flow rate of 96.1 gpcd was rounded to 100 gpcd. The maximum daily flow is 1.3:1 times the average daily flow. The prior noted peaking formula was applied to the maximum daily flow to determine the peak flow on the maximum day. These flows are presented in Tables 6-1 and 6-2, and are the basis for the analysis in this report.

Table 6-1 and Table 6-2 both indicate the existing plant will reach its rated capacity of 0.81 mgd by the Year 2010. It is recommended construction for the expansion of the HPUD Wastewater Treatment Plant commence upon completion of design to allow the required increased capacity to accept and treat the anticipated increased flows. However, as previously noted, the actual capacity of the HPUD Wastewater Treatment Plant is 0.48 mgd on an average flow basis; 0.55 mgd on a maximum month basis.

Table 6-1: Wastewater Flow Projections HPUD for 6.28% growth rate after 2010

Year	Population	Ave. Flow, mgd	Max Month Flow, mgd	Max Day Flow, mgd	Peak Hour on Max Day, mgd
2005	3,508	0.34	0.39	0.44	0.86
2006	5,556	0.56	0.64	0.73	1.36
2007	6,186	0.62	0.71	0.81	1.50
2008	6,816	0.68	0.78	0.89	1.64
2009	7,445	0.74	0.86	0.98	1.72
2010	8,076	0.81	0.93	1.06	1.91
2015	11,055	1.11	1.27	1.45	2.55
2020	15,133	1.51	1.74	1.98	3.41
2025	20,716	2.07	2.38	2.71	4.55
2030	28,358	2.84	3.26	3.71	6.07

NOTE: 2005 flows based on 96.1 gpcd. 2006-2030 flows based on 100 gpcd.

Table 6-2: Wastewater Flow Projections HPUD for 3.21% growth rate after 2010

Year	Population	Ave. Flow, mgd	Max Month Flow, mgd	Max Day Flow, mgd	Peak Hour on Max Day, mgd
2005	3,508	0.34	0.39	0.44	0.86
2006	5,556	0.56	0.64	0.73	1.36
2007	6,186	0.62	0.71	0.81	1.50
2008	6,816	0.68	0.78	0.89	1.64
2009	7,445	0.74	0.86	0.98	1.72
2010	8,076	0.81	0.93	1.06	1.91
2015	9,481	0.95	1.09	1.24	2.23
2020	11,132	1.11	1.28	1.45	2.59
2022	11,869	1.19	1.36	1.54	2.74
2025	13,069	1.31	1.50	1.70	3.00
2030	15,343	1.53	1.76	1.99	3.47

NOTE: 2005 flows based on 96.1 gpcd. 2006-2030 flows based on 100 gpcd.

6.3 Wastewater Constituent Characteristics

A statistical analysis of the 2004 and 2005 influent 5-day biochemical oxygen demand (BOD5) and total suspended solids (TSS) was performed. The analysis involved 97 data values and are regarded to be reliable. Note that influent total Kjeldahl nitrogen (TKN) and ammonia-nitrogen concentrations are not available. Table 6-3 presents a summary of the influent concentrations.

Table 6-3: Summary of the Influent Wastewater Characteristics 2004-2005

Parameter	BOD5	TSS
Average Concentration, mg/L	271	186
Minimum Concentration, mg/L	90	61
Maximum Concentration, mg/L	870	716
90^{th} Percentile Concentration, mg/L	462	307
95^{th} Percentile Concentration, mg/L	576	473

There is significant variation in the data relative to the average. One important statistic that resulted from the analysis is the average BOD5 concentration. The original plant was designed for 620 lb BOD5/day which translates to a

concentration of 183 mg/L BOD5 for the 0.405 mgd design capacity. The 2000 expansion was designed for a BOD5 of 228 mg/L. Considering both figures together, the plant is currently designed for a BOD5 concentration of 205 mg/L. The actual BOD5 wastewater concentration for the period of 2004-2005 was 271 mg/L. The actual BOD5 wastewater concentration for the period 2004-2005 was 32 percent greater than the 205 mg/L current design value. The actual capacity of the Wastewater Treatment Plant is severely impacted by the low 205 mg/L BOD5 design value.

In addition to the influent concentrations, the actual influent loads, i.e., the period of the concentration and the flow that occurred on the particular day the samples were obtained were analyzed. The analysis results rendered an accurate design parameter. The analysis is presented in Table 6-4.

Table 6-4: Summary of the Influent Wastewater Loads 2004-2005

Parameter	BOD5		TSS	
	Load, lb/d	Ratio to Ave	Load, lb/d	Ratio to Ave
Average Load, lb/d	762	1.00	528	1.00
Maximum Load, lb/d	2525	3.31	1857	6.83
90th Percentile Load, lb/d	1330	1.75	904	1.71
95th Percentile Load, lb/d	1630	2.14	1282	2.43
Maximum Monthly Load, lb/d	1308	1.72	994	1.88

Notes:
Maximum monthly load based on average of 4 consecutive weekly samples.
Maximum monthly load for 7.55 from 3/17/2001 only to exclude outliers.

The analysis of the 2004-2005 data revealed the TSS concentrations and subsequently the loading for the period from January through March 17, 2004 were extremely high. These values are considered to be anomalies since they were not experienced at other times during the analysis period. These values would increase the monthly average and maximum values to unreasonably high values. As a result, it is recommended that these outliers not be considered in the analysis of the design parameters. Refer to the note in Table 6-4.

Table 6-5 presents the design loads for the analysis of the current plant capacity and for the design of future Wastewater Treatment Plant expansions (1.2, 2.0, 2.4, and 3.2 mgd). The maximum monthly BOD5 load is an important design parameter for the treatment process. For the design of solids (sludge) handling and disposal systems, a TSS value corresponding to the maximum week is appropriate. However, since data is only obtained every week, rather than use the maximum value on the day of sampling, a value 1.1 times the maximum monthly load for TSS is appropriate. The aeration system for the biological process is required to provide oxygen on the maximum day load. Both carbonaceous and nitrogenous oxygen demands are to be included.

Table 6-5: Summary of the Design and Projected Influent Wastewater Flows and Loads

	Average Day						
	Flow	BOD5		TSS		TKN	
	mgd	Mg/L	lb/d	mg/L	lb/d	mg/L	lb/d
Current	0.34	275	780	190	540	40	110
Existing Design	0.81	275	1860	190	1280	40	270
1st Expansion	1.2	275	2750	190	1900	40	400
2nd Expansion	2.0	275	4590	190	3170	40	670
3rd Expansion	2.4	275	5500	190	3800	40	800
Ultimate	3.2	275	7340	190	5070	40	1070

	Maximum Month						
	Flow	BOD5		TSS		TKN	
	mgd	mg/L	lb/d	mg/L	lb/d	mg/L	lb/d
Flow or Load Factor	1.15		1.70		1.90		1.7
Current	0.39	410	1330	320	1030	60	190
Existing Design	0.93	410	3160	310	2430	60	460
1st Expansion	1.4	410	4680	310	3610	60	680
2nd Expansion	2.3	410	7800	310	6020	60	1140
3rd Expansion	2.8	410	9350	310	7220	60	1360
Ultimate	3.7	410	12480	310	9630	60	1820

	Maximum Day Flow	BOD5		TSS		TKN	
	mgd	mg/L	lb/d	mg/L	lb/d	mg/L	lb/d
Flow or Load Factor	1.31		2.2		2.4		2.00
Current	0.45	460	1720	350	1300	60	220
Existing Design	1.1	460	4092	350	3070	60	540
1st Expansion	1.6	460	6050	350	4560	60	800
2nd Expansion	2.6	460	10098	350	7610	60	1340
3rd Expansion	3.1	460	12100	350	9210	60	1600
Ultimate	4.2	460	16148	350	12170	60	2140

Note that Maximum Month and Maximum Day concentrations are back calculated from loads and flows.

Maximum Day Loads closely approximate the 95th Percentile; maximum day flow was the largest value on the day of sampling (i.e., once per week).

Maximum Month Factor for TSS is based on data from March 17, 2004 and does not include data from January 2004 to March 17, 2004 as these values were usually large.

The incoming BOD percent loading value is significantly greater than the original treatment facility design values. The greater than anticipated BOD loading significantly impacts the aeration system and profoundly affects the capacity of the existing oxidation ditches, the clarifiers and solids handling system. The solids handling system is also impacted from the greater than anticipated waste biosolids associated with the stabilization of the increased BOD5 load.

7 DESCRIPTION AND EVALUATION OF EXISTING WASTEWATER TREATMENT PLANT

7.0 DESCRIPTION AND EVALUATION OF EXISTING WASTEWATER TREATMENT PLANT

The Existing Wastewater Treatment Plant Facilities are illustrated by Figure 7-1. A process flow diagram of the existing Wastewater Treatment Plant has been included as Figure 7-2. The process flow diagram illustrates the relationship between the major facilities of the Wastewater Treatment Plant.

Raw wastewater enters the HPUD Wastewater Treatment Facility, first passing through parallel grinders (Channel Monsters) and then through a Parshall Flume for flow measurement. The Channel Monsters grind up but do not remove materials in the raw wastewater. Failure of the Channel Monsters to remove the solids has an effect on the Plant's downstream processes.

To address the removal of solids, HPUD Plant Operators have implemented a number of strategies. Plant Operators installed a manually cleaned screen to attempt to capture some of the ground solids. This particular approach has met with mixed success in that only a limited amount of ground solids are removed. Plant Operators have implemented a second method for capturing solids in the placement of a "rock trap" upstream of the Parshall Flume. The "rock trap" is marginally effective in removing grit. The "rock trap" is designed to capture heavy, readily settleable grit. The metered wastewater then flows into the influent pump station.

The influent pump station consists of four (4) submersible sewage pumps operating in pairs. One pair of pumps discharge to the oxidation ditch constructed during the 2000 expansion. The second pair of pumps discharge to the oxidation ditch constructed during the 1981 expansion. A "cross-over pipe" allows each pair of pumps to discharge to either oxidation ditch in an emergency. Wastewater enters the oxidation ditches and is blended with mixed liquor. Mixed

ROCKWOOD AVENUE

ROCKWOOD AVENUE

INFLUENT PUMP STATION

HEADWORKS STRUCTURE

CLARIFIER

LABORATORY BUILDING

SLUDGE BEDS

OXIDATION DITCH

RAS/WAS PUMP STATION

CLARIFIER

CLARIFIER

OXIDATION DITCH

SLUDGE BEDS

REGIONAL PUMP STATION

EMERGENCY STORAGE BASIN

CHLORINATION BLDG

DECHLORINATION BLDG

SLUDGE BEDS

RAS/WAS PUMP STATION

PROPERTY BOUNDARY OF WASTEWATER TREATMENT PLANT.

CHLORINE CONTACT CHAMBER

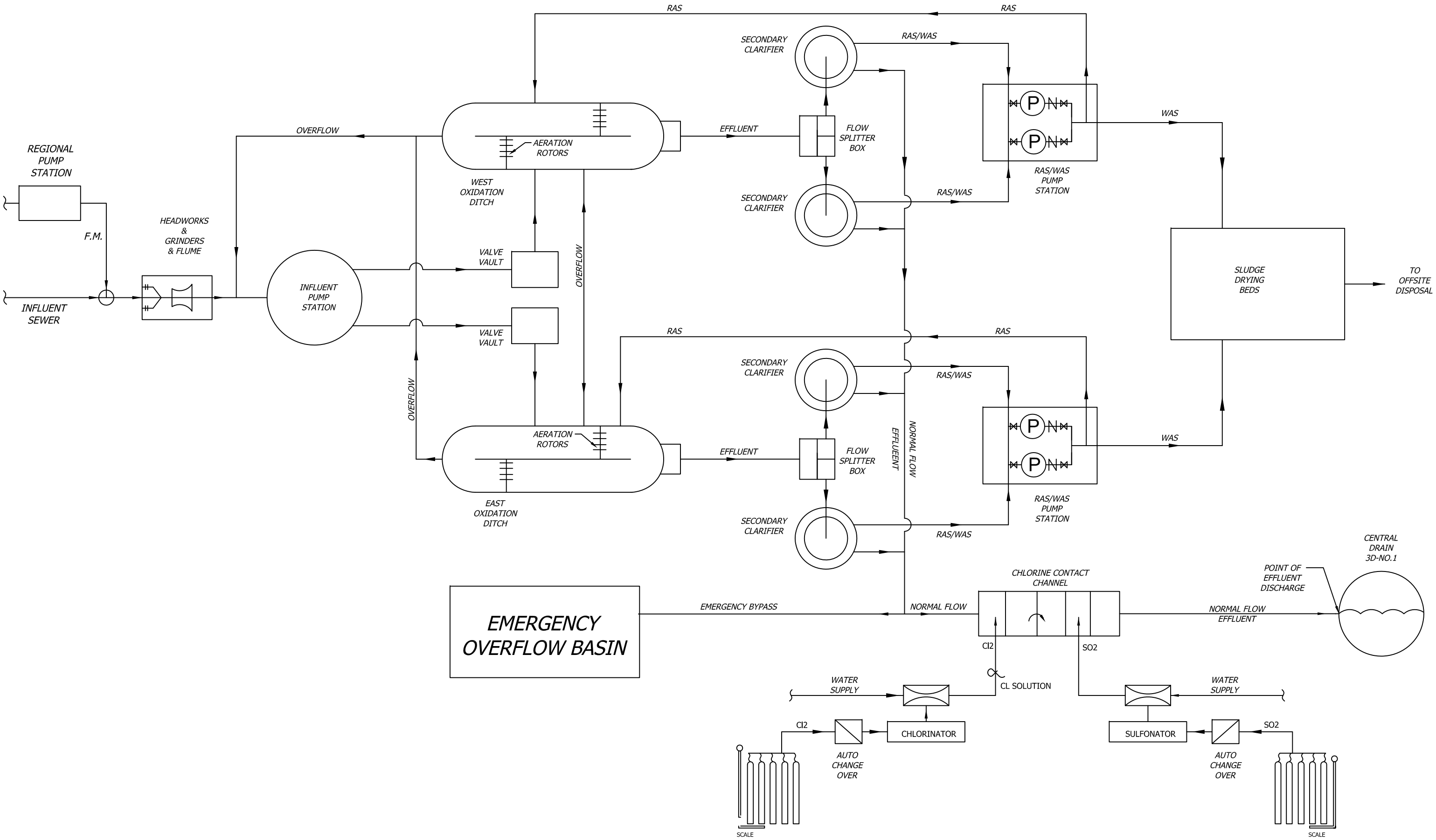
EFFLUENT DISCHARGE PIPELINE TO CENTRAL DRAIN 3D NO. 1

N

1601 N. IMPERIAL AVE PHONE : (760) 337-3883
EL CENTRO, CA 92243 FAX : (760) 337-5997

The Holt Group

SCALE:	DATE:	RPOJECT NO.		DESCRIPTION:	FIGURE:
1" = 60'-0"	05-2008	744.036E	HEBER PUBLIC UTILITY DISTRICT - WASTEWATER TREATMENT PLANT EXPANSION REPORT	EXISTING WASTEWATER TREATMENT PLANT	7-1



1601 N. IMPERIAL AVE. PHONE : (760) 337-3883 EL CENTRO, CA 92243 FAX : (760) 337-5997	The Holt Group	SCALE: NOT TO SCALE	DATE: 05-2008	PROJECT NO. 744.036E	HEBER PUBLIC UTILITY DISTRICT - WASTEWATER TREATMENT PLANT EXPANSION REPORT	DESCRIPTION: PROCESS FLOW DIAGRAM FOR EXISTING FACILITIES	FIGURE: 7-2

liquor is the mixture of raw or settled wastewater and activated sludge contained in the oxidation ditch.

The oxidation ditch is a continuous, looped reactor in a "racetrack" configuration. Oxygen is supplied by horizontal brush rotor aerators. There are two (2) horizontal brush rotor aerators present in each oxidation ditch. The brush rotor aerators provide the energy to generate movement of the liquid in the oxidation ditch. The mixed liquor flows over an adjustable weir gate and into the secondary clarifiers.

Two (2) secondary clarifiers are located downstream of each oxidation ditch. The suspended solids in the mixed liquor are separated from the liquid in the secondary clarifiers. The mixed liquor suspended solids settle to the bottom of the clarifier. The clarified liquid exits over the peripheral weir. The effluent from the secondary clarifiers flows to a chlorine contact channel. Chlorine, in the form of a gas dissolved in water, is added at the upstream end of the chlorine contact channel. Disinfection takes place in the channel. Prior to the discharge of the disinfected effluent, the effluent is dechlorinated with sulfur dioxide gas dissolved in water.

Suspended solids which settle in the secondary clarifiers are pumped back to the oxidation ditch by the return activated sludge (RAS) pumps. In the wastewater treatment process, suspended solids are produced and periodically removed, or "wasted", to maintain the balance within the oxidation ditch. The amount of suspended solids which are wasted depends on the characteristics of the influent wastewater and the operational parameters of the process. The solids produced by the HPUD Wastewater Treatment Plant are wasted to sludge drying beds (also referred to as solar drying beds) by opening a manually operated valve on the return sludge line.

The HPUD Wastewater Treatment Plant has two (2) types of sludge drying beds: concrete-lined with a center drainage strip constructed during the 1981 expansion and sand-lined drying beds constructed during the 2000 expansion. The water in the sludge, which is wasted to the drying beds, drains off slowly. The drainage water flows back to the influent sewage pump station. The bulk of the water evaporates within the drying beds, which is a slow and inefficient process, particularly in cooler temperatures. One of the major problems observed at the HPUD Wastewater Treatment Plant is the inability to waste and dewater solids.

In general, the Wastewater Treatment Plant currently consists of a headworks, a flowmeter structure, an influent pump station, two (2) oxidation ditches, four (4) secondary clarifiers, a chlorine contact channel, chlorination and de-chlorination facilities, four (4) return-waste activated sludge pump stations, sludge drying beds, an operations building, electrical power facilities and instrumentation, and control facilities. These facilities will be reviewed in detail throughout the remainder of this section.

7.1 Influent Grinding and Flow Measurement Flume

The existing Wastewater Treatment Plant has two (2) Channel Monster Grinders working in parallel, followed by a "rock trap" and a Parshall Flume. Data on the process is included in Table 7-1. The Grinders and Parshall Flume were installed with the 2000 expansion. The Grinders and Parshall Flume are in good condition and are likely to function as viable treatment components for many years. At the present time the grinding system is limited to the capacity of one of the grinders. A grinder has the capacity of 3.7 mgd peak flow, which corresponds to an average flow of 1.7 mgd. This flow is not anticipated to be reached until 2020 based on Table 6-1. The Parshall Flume possesses adequate capacity for well beyond the year 2020.

Table 7-1: Capacity Analysis of Existing Grinding and Flow Measurement

Grinders	
Type and Model	Channel Monster by JWC Environmental CMD 2410 Single Drum, Hydraulic Drive, 5 HP
Number of Units	2
Capacity Each	3.7 mgd, peak (1.7 mgd equiv. average flow)
Condition	Good
Parshall Flume	
Throat Width	9 inches
Capacity Range	0.065 to 5.7 mgd (2.6 mgd equiv. average flow)

The Heber Public Utility District Plant Operators have expressed concerns regarding the amount of solids and solids fragments that accumulate in the downstream processes. This accumulation occurs because the Channel Monsters only grind up the incoming wastewater solids but do not remove them. The Operators have installed a manually cleaned screen downstream of the Channel Monsters to attempt to screen out the solids. The installation of the manually cleaned screen has been marginally effective.

The "rock trap" is effective only at removing large rock particles. It is not a grit removal system. It is likely that grit is accumulating in downstream processes. A grit removal system should be added to the existing plant headworks area.

7.2 Influent Wastewater Pumping

The existing influent pump station consists of two (2) pairs of submersible wastewater pumps. Table 7-2 contains information regarding the existing Influent Wastewater Pump Station. Each pair of pumps are dedicated to one of the oxidation ditches. The pump station was constructed during the 2000 expansion. The interior concrete work appears to be satisfactory; however, the

steel members and checker plate covers are severely corroded. The steel members and checker plate covers require replacement.

Table 7-2: Capacity Analysis of Existing Influent Wastewater Pumping Station

Type and Model	KSB Pump Model KRTK150/96XG 6-in submersible pump
Capacity Each	600 gpm (0.86 mgd)
Number of Units	4
Firm Capacity with 1 Standby and Crossover Open Firm Capacity with Crossover Closed	1800 gpm (2.6 mgd) 1200 gpm (1.7 mgd) (0.76 to 1.2 mgd equiv. average flow)
Condition	Two (2) were out of service in March, 2006

Although there are four (4) pumps, they are arranged and operated in groups of two (2). It is possible to use three (3) pumps (assuming they were operative) but this would require opening a crossover line and manually balancing the flow between oxidation ditches. Magnetic flow meters have been provided to measure and adjust the flow if this mode of operation is selected.

A hydraulic analysis was performed on the influent piping system from the pump station to the oxidation ditches. The analysis indicates each pump is capable of conveying between 475 gpm (0.68 mgd) and 700 gpm (1.0 mgd) depending on the level in the wet well.

The new HPUD Regional Pump Station upstream of the Wastewater Treatment Plant was activated and placed in service on August 30, 2006. The capacity of this Pump Station has been measured to be approximately 640 gallons per minute. When combined with the current peak flow (estimated to be 0.94 mgd or 650 gpm), the flow to the existing influent pump station will be 1,290 gpm under a

condition of simultaneous occurrence of peak flows. The simultaneous occurrence of peak flows is a likely scenario for small collection systems.

7.3 Secondary Treatment System

The secondary wastewater treatment system consists of the following units which will be analyzed together as a "system". These units include:

- Oxidation Ditches (continuous loop reactors)
- Secondary Clarifiers
- Return and Waste Activated Sludge Pumping (RAS and WAS respectively)
- Aeration

The existing Wastewater Treatment Plant consists of two (2) parallel oxidation ditches with separate secondary clarifiers and return and waste activated sludge systems. Each oxidation ditch is independent of the other. Each oxidation ditch is aerated with two (2) horizontal, brush rotor aerators which introduce oxygen to the wastewater and provide the energy to keep the liquid moving around the loop and the solids in suspension. The characteristics of the existing secondary treatment system are presented in Table 7-3. The condition of the year 2000 secondary treatment plant facilities (West Ditch) is good. The year 1981 secondary treatment plant oxidation ditch (East Ditch) concrete basin is cracked and has spalled. The cracked and spalled concrete requires repair. The secondary clarifiers associated with the year 1981 East Ditch are too shallow for secondary treatment facilities. The aeration rotors on the year 1981 East Ditch were replaced when the year 2000 Wastewater Treatment Plant improvements were completed. The year 2000 aeration rotors are in good condition.

Table 7-3: Characteristics of the Existing Secondary Treatment System

Year 1981 Secondary Plant (East Ditch)	
Oxidation Ditch	
Volume	0.405 MG
Water Depth	5 ft
Configuration	Trapezoidal shape with 18-ft bottom width and 1:1 side slopes
HRT at rated design flow	24 hr
Design SRT	30 days
Secondary Clarifiers	
Number	2
Diameter	25 ft
Side Water Depth	10 ft
Return & Waste Activated Sludge Pumps	
Number	2 (1 duty, 1 standby)
Type	Gorman Rupp Self Priming, Constant Speed
Capacity	275 gpm (will pump to about 325 gpm depending on actual head)
Horsepower	7.5
Aeration	
Type	Horizontal Brush Rotors, Lakeside Magna Rotors
Number	2
Diameter	42 in
Length Each	16 ft
Operating Speed	58 rpm
Motor Horsepower	30
Maximum Submergence	15 in
Aerator Capacity @ Maximum Submergence	72 lb O2/hr Standard Conditions 41 lb O2/hr Field Conditions

Year 2000 Secondary Plant (West Ditch)	
Volume	0.405 MG
Water Depth	5 ft
Configuration	Trapezoidal shape with 18-ft bottom width and 1:1 side slopes
HRT at rated design flow	24 hr
Design SRT	30 days
Secondary Clarifiers	
Number	2
Diameter	28 ft
Side Water Depth	12 ft
Return & Waste Activated Sludge Pumps	
Number	2 (1 duty, 1 standby)
Type	Gorman Rupp Self Priming, Constant Speed
Capacity	280 gpm @ 37 ft TDH (will pump to about 325 gpm depending on actual head)
Horsepower	7.5
Aeration	
Type	Horizontal Brush Rotors, Lakeside Magna Rotors
Number	2
Diameter	42 in
Length Each	16 ft
Operating Speed	73 rpm
Motor Horsepower	20
Maximum Submergence	9 in (limited by motor HP)
Aerator Capacity @ Maximum Submergence	71 lb O2/hr Standard Conditions 40.5 lb O2/hr Field conditions

7.3.1 Oxidation Ditches

The capacity of the oxidation ditches was based on a process analysis using the following criteria:

- Net yield coefficient, lb volatile suspended solids (VSS)/lb BOD5 removed = 0.7
- Mixed liquor VSS/TSS = 0.75
- Maximum practical mixed liquor suspended solids concentration - approximately 5000 mg/L
- Anticipated return and waste activated sludge concentration =10,000 mg/L

- Influent BOD5 and TKN per the wastewater characteristics presented previously
- Effluent BOD5 = 5 mg/L; effluent TKN = 3 mg/L, fully nitrified
- Total nitrogen in the VSS = 10%
- Oxygen transfer capacity for the rotors was obtained from manufacturer's curve at standard conditions (sea level, zero dissolved oxygen, and clean water); design mixed liquor dissolved oxygen = 2.0 mg/L, $a = 0.82$ per Table 5-32 in Metcalf and Eddy 4th ed., ß = 0.93, wastewater temperature = 32°C

The net yield coefficient determines the amount of volatile suspended solids produced and is a key design parameter as it influences the size and capacity of the oxidation ditch and the solids handling systems. The value was taken from the American Society of Civil Engineers/Water Environment Federation, Manual of Practice 8 (ASCE/WEF MOP-8) and depends on the solids retention time (SRT). The value chosen is reasonable for plants without primary clarification with SRT values in the range of 20 to 30 days.

The mixed liquor VSS/TSS ratio is frequently assumed to be approximately 0.80. However, based on data provided by HPUD and the fact that the SRT values will be relatively lengthy (20 to 30 days), there will be more opportunities for non-biodegradable materials to accumulate in the mixed liquor. A ratio of 0.75 (i.e., 75% volatile solids) reflects this increased non-biodegradable (non-volatile) material.

A limit of approximately 5000 mg/L was set for the maximum mixed liquor concentration (the TSS concentration in the oxidation ditch). As the concentration exceeds this level, there may not be enough energy to keep the concentration of solids in suspension in the oxidation ditch. Higher concentrations may not be possible even with optimum performing clarifiers.

In the capacity analysis, it has been assumed that the RAS and WAS concentrations would be 10,000 mg/L. For a well performing oxidation ditch and properly designed secondary clarifiers, this concentration is reasonable. It is not likely this concentration can be achieved with the existing secondary clarifiers. Rather than have the existing secondary clarifiers limit the oxidation ditch capacity at this time, it is assumed that the existing clarifiers will be replaced with larger, deeper clarifiers with improved, high efficiency spiral sludge collectors.

As stated previously, the influent BOD5 has increased significantly above the original design value. The increase impacts the amount of VSS produced based on the net yield coefficient. The oxidation ditches have a fixed volume and an established mixed liquor concentration limit. The oxidation ditches can contain only a fixed amount of total suspended solids. These factors limit the SRT of the ditches and impact the oxidation ditch treatment capability.

Table 7-4: Existing Oxidation Ditches Operational Characteristics

Average Flow			
Flow, mgd	0.338	0.60	0.80
BOD5, mg/L	275	275	275
BOD5, lb/d	775	1376	1835
TKN, mg/L	40	40	40
TKN, lb/d	113	200	267
MLSS, mg/L	3155	4670	4978
SRT, days	30	25	20
HRT, hrs	57.5	32.4	24.3
RAS, gpm	108	365	555
Maximum Month			
Flow, mgd	0.39	0.69	0.93
BOD5, mg/L	410	410	410
BOD5, lb/d	1335	1726	3146
TKN, mg/L	60	60	60
TKN, lb/L	195	225	460
MLSS, mg/L	4550	4991	4937
SRT, days	25	15.5	11.5
HRT, hrs	49.8	28.2	24.3
RAS, gpm	226	477	623*

*Exceeds current total RAS pumping capacity with one standby for each oxidation ditch

The data in Table 7-4 indicates that at 0.69 mgd and 0.93 mgd maximum monthly flows (equivalent average annual flow of 0.6 mgd and 0.81 mgd respectively) to the existing oxidation ditches are inadequate. The SRT values of 15.5 and 11.5 respectively are too low for an oxidation ditch. Based on interpolation of the results in Table 7-4, it appears the existing oxidation ditches can only accommodate a maximum monthly flow of 0.55 mgd (equivalent average annual flow of 0.48 mgd). The analysis is based strictly on the SRT and the desired maximum Mixed Liquor Suspended Solids (MLSS) of 5000 mg/L.

7.3.2 Aeration (Rotor Capacity)

Table 7-4 presented previously identified the existing oxygenation capacity of the rotors. Table 7-5 presents the oxygen requirements for various average flow rates and the corresponding maximum month and maximum day flow and loadings. Aeration systems are required to meet the maximum day oxygen supply requirements as a minimum with appropriate standby capacity.

Table 7-5: Existing Plant Oxygen Requirements

Average Flow			
Flow, mgd	0.338	0.60	0.80
BOD5, mg/L	275	275	275
BOD5, lb/d	775	1376	1835
TKN, mg/L	40	40	40
TKN, lb/d	113	200	267
Oxygen Required, lb/hr	33.7	59.8	79.8
Maximum Month			
Flow, mgd	0.39	0.69	0.93
BOD5, mg/L	410	410	410
BOD5, lb/d	1335	1726	3146
TKN, mg/L	60	60	60
TKN, lb/d	195	225	460
Oxygen Required, lb/hr	59.3	105*	140*
Maximum Day			
Flow, mgd	0.45	0.79	1.05
BOD5, mg/L	460	460	460
BOD5, lb/d	1726	2306	3065
TKN, mg/L	60	60	60
TKN, lb/d	225	395	525
Oxygen Required, lb/hr	71.8	126*	168*

*Exceeds the capacity of one rotor in each ditch. Can provide a total of 162 lb/hr with all rotors operating.

From an operational standpoint, the existing oxidation ditch aeration system, with one rotor in standby, can only provide the oxygen requirements on the maximum day for an equivalent average flow of 0.38 mgd. For average annual flows in excess of 0.38 mgd, both rotors in both ditches must be operating to accommodate the flows and loads on the maximum day that could be experienced with that average annual flow.

7.3.3 Secondary Clarification

The secondary clarification process is controlled by two (2) parameters: surface overflow rate (SOR) and solids loading rate (SLR). Table 7-6 presents the SOR and SLR for various flow combinations. The SOR for average flows should be limited to 200 to 400 gal/d/sq ft at average flow and 600 to 800 gal/d/sq ft at peak flow. Since the ratio of the average flow to the peak flow for the HPUD wastewater treatment plant is less than 3:1, the average SOR will control. The SLR should be limited to 0.2 to 1.0 lb/sq ft/hr (4.8 to 24 lb/d/sq ft). Both the SOR and the SLR rates cited are from Metcalf and Eddy 4th Ed., Table 8-7. For the HPUD wastewater treatment plant, the SOR will be limited to 300 gal/d/sq ft and the SLR to 12 lb/sq ft/d for the average and maximum monthly flows. For the maximum day flows the limits should be 400 gal/d/sq ft and 16 lb/sq ft/day. Table 7-6 presents a summary of the flows and loading rates for the existing secondary clarifiers.

Table 7-6: Existing Secondary Clarifier Operational Characteristics

Average Flow			
Flow, mgd	0.338	0.60	0.80
SOR, gal/d/sq ft	153	271	362
SLR, lb/sq ft/d	5.9	19.8	29.9
Maximum Month Flow			
Flow, mgd	0.39	0.69	0.93
SOR, gal/d/sq ft	176	312	416
SLR, lb/sq ft/d	12.3	25.9	33.8

Maximum Day Flow			
Flow, mgd	0.45	0.79	1.05
SOR, gal/d/sq ft	203	357	475
SLR, lb/sq ft/d	17.5	29.4	38.9

From a SOR standpoint, the secondary clarifiers are limited to 0.60 mgd average daily flow if the SOR is allowed to attain 400 gal/d/sq ft on the maximum day as an average. From a SLR standpoint, the secondary clarifiers are limited to the current average day flow. Even so, the SLR on the maximum day will be greater than 16 lb/sq ft/d. In summary, the secondary clarifiers are marginal, at best, for the present flow rate.

7.4 Disinfection and Dechlorination System

7.4.1 Disinfection

The current disinfection system replaced the "WaterChamp" system installed with the 2000 expansion. The chlorination system is installed in a fiberglass structure and is equipped with a scrubber in the event of a gas leak. Disinfection is required to comply with the NPDES permit requirement of the log mean E-coli most probable number (MPN) at 126 per 1,000 mL and a maximum of 400 MPN per 100 mL. "Log mean" is the average of the logarithms to base 10, of the samples collected over any 30-day period. The "anti-log" of the average value is then determined. The "anti-log" is equivalent to 10 raised to the log mean. The facility uses compressed gaseous chlorine in 150-lb cylinders. Four cylinders are manifolded together to a common chlorine rate control unit. The chlorine gas, under a vacuum generated by an ejector, is mixed with water in the ejector and introduced into the inlet to the chlorine contact tank.

An uncovered chlorine contact channel provides the retention time needed for inactivation of the bacteria and pathogens. The channel has over and under baffles to minimize short circuiting. Since the effluent from the Treatment Facility is not required to meet California Administrative Code Title 22 requirements at

this time, there is no minimum hydraulic retention time (HRT) required. In these cases, HRT of 30 minutes at peak flow is adequate.

The 2000 expansion was designed for 45 minutes at peak flow. Data on the existing chlorination system is provided in Table 6-7. The table indicates the chlorination system is limited by the rate at which chlorine can be withdrawn from the cylinders. Excessive withdrawal rates will cause "frosting" of the cylinders, which in turn reduces the vapor pressure inside the cylinder and reduces the withdrawal. Since the unit is in an enclosed area, this may not be a significant problem. Nevertheless, it should be monitored. If this is a problem, the rate can be increased by manifolding additional cylinders to the switchover device.

Table 7-7: Capacity Analysis of Existing Disinfection System

Chlorine Contact Channel	
Length x Width x Depth	246 ft x 5.5 ft x 6.5 ft
Length to Depth Ratio Length to Width Ratio	37.8:1 44.7:1
Volume	65,780 gallons
Hydraulic Retention Time at Peak Flow	30 minutes
Capacity	1.4 mgd equiv. average flow
Chlorination System	
Chlorine Control Unit (Chlorinator)	Wallace and Tiernan Model V10K, 200 lb/d capacity equipped with a 100 lb/d rotameter
Estimated Chlorine Dose	10 mg/L
Capacity of chlorinator (200 ld/b) Capacity of existing rotameter (100 lb/d)	1.08 mgd equiv. average flow 0.54 mgd equiv. average flow
Number of on-line cylinders	4 total, 2 on line; 2 ready standby
Maximum gas withdrawal rate per cylinder	40 lb/d 80 lb/d total (2 on line) 0.43 mgd equiv. average flow
Ejector Capacity	200 lb/d

Currently there are two (2) sets of 2 cylinders. Manifolding 3 cylinders to each side will increase the rate to 120 lb/day to 0.65 mgd equivalent average day flow. There is no limit to the number of cylinders that can be manifolded together. The only constraint is space limitations.

7.4.2 Dechlorination

Dechlorination is required to meet the effluent limits for chlorine residual which is toxic to aquatic life. The facility uses compressed gaseous sulfur dioxide in 150-lb cylinders. Four cylinders are manifolded together to form a common sulfonator rate control unit. The sulfur dioxide gas, under a vacuum generated by an ejector, is mixed with water in the ejector and introduced at the outlet of the chlorine contact tank. The sulfur dioxide gas is introduced just before the effluent leaves the chlorine contact channel and discharges to the Imperial Irrigation District Central Drain 3-D No. 1. Since the reaction rate between sulfur dioxide and chlorine is quite rapid, there is no need for long contact times. The current system replaced the "WaterChamp" system installed during the 2000 expansion. The sulfur dioxide system is installed in a fiberglass structure and is equipped with a scrubber in the event of a gas leak. Data on the existing dechlorination system is provided in Table 6-8. As with the chlorination system, the capacity is limited by the cylinder withdrawal rate. It is likely that additional cylinders need to be manifolded together to ensure the cylinders do not "frost up" under high demand situations.

Table 7-8: Capacity Analysis of Existing Dechlorination System

Sulfur Dioxide Control Unit (Sulfonator)	Wallace and Tiernan Model V10K, 200 lb/d capacity equipped with a 100 lb/d rotameter.
Estimated Chlorine Residual	5 mg/L
Estimated Sulfur Dioxide Feed Rate	0.90 mg SO2/mg C12 residual (stoichiometric dose) 1.2 mg SO2/mg C12 residual (design)
Estimated Sulfur Dioxide Dose	6 mg/L
Capacity of Sufonator (200 lb/d) Capacity of existing rotameter (100 lb/d)	1.8 mgd equiv. average flow 0.9 mgd equiv. average flow
Number of on-line cylinders	4 total, 2 on line; 2 ready standby
Maximum gas withdrawal rate per cylinder	40 lb/d 80 lb/d total (2 on line) 0.72 mgd equiv. average flow
Ejector Capacity	200 lb/d

7.5 Biosolids Handling

It is necessary to waste biosolids from the process at the same rate the biosolids are being produced. The existing plant uses solar drying beds to dewater the solids to the point the solids can be hauled away to an approved disposal site. Table 7-9 presents a summary of the sludge drying beds.

Table 7-9: Capacity Analysis of Existing Sludge Drying Beds

Old Plant	
Number of Beds	6
Size	896 sq ft each 5376 sq ft total
Type	Concrete paved with center sand drainage trough
New Plant	
Number of Beds	10
Size	999 sq ft each 9990 sq ft total
Type	Sand lined with concrete access strips, membrane liner underneath

Total Both Facilities	
Area	15,366 sq ft
Sludge Application Depth	0.75 ft (9 inches)
Volume each bed (approximately)	720 cu ft (5385 gal)
Annual Pan Evaporation	105.4 in (Indio)
Annual Precipitation	2.6 in (El Centro)
Sludge bed evaporation / Pan Evaporation	0.8
Percent of water drained away	70% (sand beds) None (paved beds)
Percent of water decanted	None - no decanting system
Applied sludge concentration	10,000 mg/L
Waste sludge volume	25,500 gal/mgd
Drying bed capacity	0.21 mgd (average wastewater flow basis)

It has been observed that the biosolids (waste sludge) handling facilities are critically under-designed (only sufficient capacity for an influent flow of 0.21 mgd) and are creating major problems in the operation of the Wastewater Treatment Facility. With the current flows, operators are not able to waste the amount of sludge required to keep the process stable and operating properly, particularly in the cooler winter months. One of the reasons for this problem is the influent BOD5 is 32 percent greater than the current plant design. The increase in BOD5 loading increases the amount of volatile solids produced in the process by nearly one-third. This also reduces the design solids retention time (SRT) in the oxidation ditch. The reactor oxidation ditch capacity size and secondary clarifier capacity size are fixed. The amount of biosolids to be disposed is therefore increased. The mixed liquor concentration is limited by the oxidation ditch and secondary clarifier size.

The Plant Operators reported wasting approximately 10,000 gallons of sludge (approximately) per clarifier per week based on 300 gpm for 30 minutes. This amounts to 30,000 gallons of sludge per week. A mass balance performed for the current flow indicated that approximately 8,300 gal/d of sludge (58,100 gal/week) at 10,000 mg/L is required to be wasted to maintain the plant in a

steady state. Based on this analysis the actual sludge volume wasted is approximately half of what it should be. The sludge wasted is greater than 10,000 mg/L. Table 7-9 indicates the capacity of the drying beds is 0.21 mgd based on average influent wastewater flow. If the solids concentration in the waste sludge is higher, then the capacity would be increased proportionally.

Another parameter commonly considered for drying beds is the annual solids loading. Currently, it is estimated that 710 lbs of dry solids are generated per day or 260,000 lb dry solids/year. The total drying bed area is 15,366 sq ft, resulting in a unit loading rate of 16.9 lb dry solids/sq ft/yr. This is within the range for drying bed loading commonly quoted in textbook literature; however, those loading rates are for digested primary or primary and waste activated sludge and are usually applied at a concentration of 2.5 to 3 percent by weight, leaving a substantially lower volume of water to evaporate or drain away.

In Southern California, experience has also demonstrated that sludge drying beds typically take 21 days to "turn over" (the cycle time from filling to emptying the sludge beds). There are 10 existing drying beds which provide only 210 days of capacity, assuming 1 bed is drawn per day. This could be accomplished with the existing basins; however, as shown in Table 7-9, the sludge level would be greater than 9 inches in depth. This is likely satisfactory for thin sludge. The existing sludge bed capacity is 60 percent of the capacity required. This closely matches the shortfall illustrated by Table 7-9 - 0.12 mgd/0.60 = 0.35 mgd, roughly the current flow.

With the increase in flows anticipated, the condition of the solids disposal is critical. A short term "quick fix" has been the implementation of a decanting system in selected drying beds in conjunction with a polymer feed system on the waste sludge line. The addition of polymer facilitates separation of the solids from the liquid and allow for decanting to occur.

7.6 Biosolids Disposal

Biosolids disposal shall conform to 40CFR Part 503, commonly referred to as the "503 Sludge Regulations". It is important to note that these regulations do not apply to screenings and grit from preliminary treatment operations. Data was not available concerning the quality of the existing sludge relative to metal pollutant concentrations contained in Tables 1 through 4 of the regulations.

From a "vector attraction" standpoint, the biosolids are considered unclassified (not even Class "B" biosolids). To be considered as Class "B", the biosolids must undergo aerobic digestion at 20 degrees Celsius for a solids retention time of 40 days or the sludge is to be air dried for a minimum of 3 months. As such, the biosolids from the Plant are deemed "unclassified" and are required to be disposed of in a landfill or disposed of by a contractor providing additional processes to reduce the vector attraction, e.g., composting.

7.7 Electrical

The existing electrical power system is adequate for the existing Wastewater Treatment Plant Units. Additional power control panels will be required for the new Wastewater Treatment Facilities.

7.8 Instrumentation and Controls

There is no existing Control or Telemetry Systems at the Plant. Both Telemetry and Control Systems are deemed essential components of a Wastewater Treatment Plant. There is an autodialer system located at the Plant which contacts the Plant Operators for basic alarm functions of the influent pump station; i.e., loss of power, etc.

7.9 Emergency Standby Power

The capacity of the existing generator set is 300kV, 0.8 peaking factor, 375 kVA for continuous standby Operation. The generator set is sized at 277/480 volts, 3 phase, 4 wire, 60 hertz, 451 full load amps.

7.10 Summary of the Capacity of the Existing Wastewater Treatment Plant

The existing HPUD Wastewater Treatment Plant unit process capacities are graphically illustrated by Figure 7-1. The graph clearly indicates the plant capacity is limited by: 1) the brush rotors, 2) the secondary clarifiers, 3) the sludge drying beds. The brush rotors are adequate if there are two rotors active in each oxidation ditch at all times. Mechanical breakdowns and periodic maintenance will periodically result in inactive mechanical rotors. The secondary clarifiers are inadequately sized. The replacement of the secondary clarifiers is required. Mechanical or alternative solids dewatering be constructed in lieu of sludge beds. Sludge dewatering is especially critical during the cooler winter months.

In summary, the actual capacity of the existing Wastewater Treatment Plant is 0.48 mgd (0.55 mgd equivalent maximum monthly flow), provided the secondary clarifiers are replaced, additional aeration capacity is made available on a standby basis, and some alternative solids disposal method is implemented.

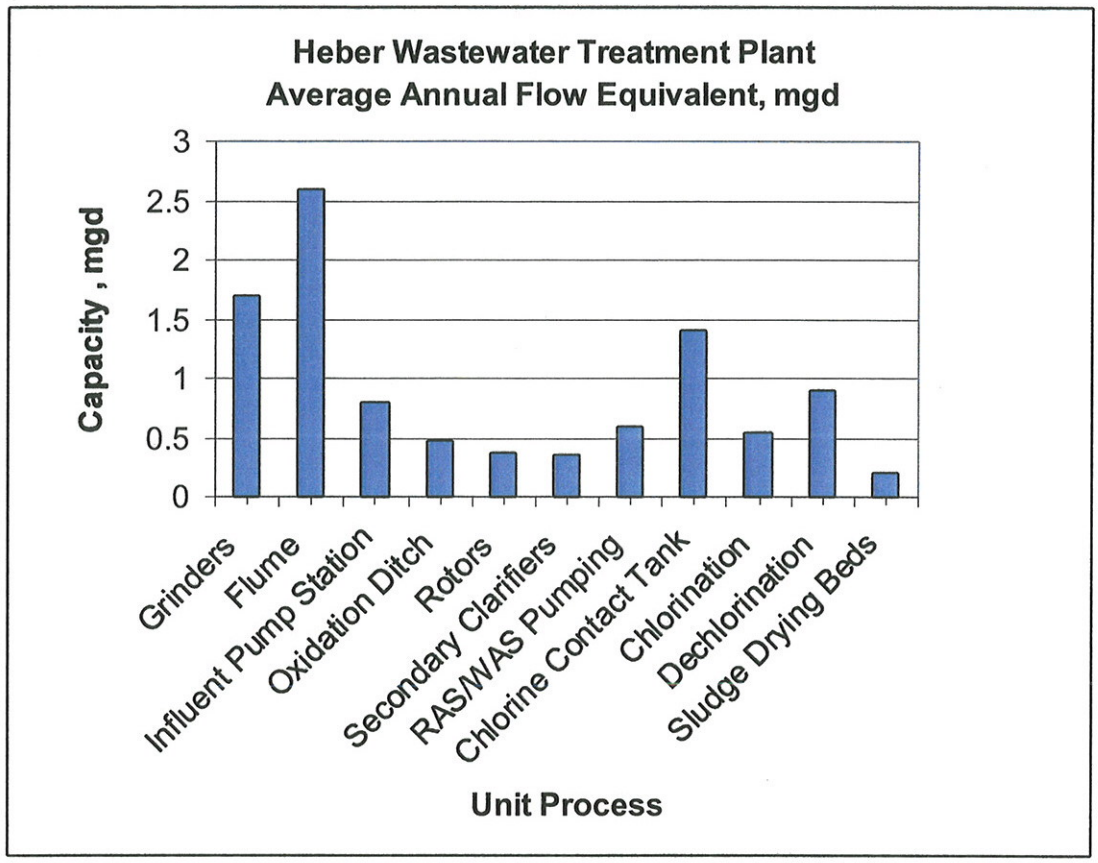


Figure 7-1: Capacity of Existing Facilities

8 RECOMMENDED EXPANSION IMPROVEMENTS TO MEET PROJECTED FLOWS

8.0 RECOMMENDED EXPANSION IMPROVEMENTS TO MEET PROJECTED FLOWS

The expanded Heber Wastewater Treatment Plant will integrate the existing oxidation ditches with new facilities to provide an average daily flow capacity of 1.2 mgd. It is anticipated the proposed expansion shall provide a capacity beyond the year 2015. It is anticipated the second proposed expansion will increase the Wastewater Treatment Plant capacity to 2.0 mgd. It is anticipated the third expansion will increase the Wastewater Treatment Plant capacity to 2.4 mgd. The Wastewater Treatment Plant capacity can ultimately be increased to 3.2 mgd. All of the above noted flows are based upon annual average flows. Expanding the Wastewater Treatment Plant to 1.2 mgd average daily flow will include the following:

- New fine screening system to remove the chopped screenings from the existing "channel monster".
- New grit removal system, to separate grit from organic.
- Activated sludge process (Biological) system designed for nitrification with sufficient capacity to accommodate denitrification at a later date if needed.
- New Return Activated Sludge (RAS) and Waste Activated Sludge (WAS) pumping systems
- New secondary clarifiers to serve the existing oxidation ditches and the new extended aeration system.
- New sludge dewatering system.
- Expansion of chlorination and dechlorination disinfection system or new ultraviolet disinfection system.

Alternative Analysis for Activated Sludge (Biological) process systems and Disinfection systems have been prepared by Webb Associates and AQUA Engineering. The Alternative Analysis has been made an attachment to this

report as Appendix "C". Refer to Appendix "C" for a detailed evaluation of the Alternative Analysis.

The new fine screen system, grit removal system, RAS and WAS pumping system, secondary clarifiers and sludge dewatering systems are considered necessary facilities in the design of a wastewater treatment plant, however, are not deemed significant to be reviewed with equal design alternatives. The review of these facilities are described in this section.

8.1 Existing Headworks

The existing headworks include two (2) parallel Channel Monsters each of which will accommodate up to 3.7 mgd as peak flow. This corresponds to 1.7 mgd of average daily flow. This will be ample capacity for the foreseeable future. No change is recommended.

There is a 9-inch throat Parshall Flume in the headworks structure which has a rated capacity of 5.7 mgd at peak flow. A peak flow of 5.7 mgd corresponds to an average daily flow of 2.6 mgd. According to the projected flows illustrated on Table 7-1, the Parshall Flume shall be capable of providing adequate flow measurements until after the year 2005. No change is recommended.

8.2 Existing Influent Pump Station

The existing influent pump station possesses four (4) pumps with a capacity of 600 gpm each. Due to the long life and extreme wear of the existing pumps, regular maintenance of the pumps has been an expensive operational cost to the wastewater treatment plant. It is proposed that three of the existing pumps be replaced with an increase in capacity to allow for redundancy. The capacity of the each new pump at 1,250 gpm each is sufficient for peak hourly flow of up to 1.8 mgd. It is recommended the influent pumps be retrofitted with variable frequency drives to optimize the operation of the influent pump station and save energy costs. It is recommended the discharge piping be combined to a single

pipeline upstream of the screening/grit removal facility. During the design phase, the pump hydraulics shall be required to be analyzed to ensure the pumps possess adequate discharge head. This is especially important if the pump motors are to be powered by variable frequency drive units. The parameters of the influent pump station for future average flows of 1.2, 2.0 and 2.4 mgd are depicted in Table 8-1.

Table 8-1: Influent Pump Station's Parameters for Future Flows

Average Flow, mgd	1.2	2.0	2.4
Peak Hourly Flow, mgd	2.64	4.4	5.3
Peak Flow, gpm	1830	3060	3680
Pumps Duty/ standby	3/1	3/1	3/1
Capacity each, gpm	1,250	1,250	1,250
TDH, estimated, ft	35	38	40
Horsepower, estimated	10	20	25

8.3 Proposed Influent Screening

It is recommended a screw press remove chopped up solids from the wastewater. The installation of a screw press will negate the need for the existing inefficient manual screening system currently located within the headworks structure. The parameters of the influent screenings for future average flows of 1.2, 2.0 and 2.4 mgd are depicted in Table 8-2.

Table 8-2: Influent Screening's Parameters for Future Flows

Average Flow, mgd	1.2	2.0	2.4
Peak Flow, mgd	2.64	4.4	5.3
Peak Flow, gpm	1830	3060	3680
Number of Screens	2	2	2
Capacity each, mgd	2.6	2.6	2.6
Approximate Quantity of Screenings, cu ft/d	18	30	36
Screenings Handling	Screenings will be washed, compacted and bagged for landfill disposal.		

It is recommended the influent screening structure be constructed at finish grade. It is recommended two (2) screens be positioned in parallel.

8.4 Proposed Grit Removal

There are two (2) common methods of grit removal; aerated and vortex. Vortex grit chambers have lower operating costs. An aeration blower is not required with a vortex grit chamber. Vortex grit chambers are preferred for plants with nitrogen removal since oxygen is not added to the wastewater. Oxygen interferes with the nitrogen removal process. The wastewater enters and exits the grit chamber tangentially. The vortex flow facilitates the grit removal. The removed grit is pumped to a grit washer/classifier. Washed grit is collected in a dumpster and hauled to a landfill. Redundancy is not contemplated as the systems are reliable and seldom require maintenance. In the event maintenance requires the isolation and bypass of the grit chamber, the small amount of grit accumulated in downstream processes is negligible. The parameters of the grit removal for future average flows of 1.2, 2.0 and 2.4 mgd are depicted in Table 8-3.

Table 8-3: Grit Removal Parameters for Future Flows

Average Flow, mgd	1.2	2.0	2.4
Peak Flow, mgd	2.64	4.4	5.3
Peak Flow, gpm	1830	3060	3680
Number of Grit Chambers	1	1	1
Peak Flow Capacity each, mgd	2.6	2.6	2.6
Grit Washer/Classifiers	1	2	2
Grit Quantity, cu ft/d	3	5	6
	Grit will be pumped to a grit washer/classifier and discharged to a dumpster for landfill disposal.		

8.5 Secondary Treatment

Alternatives for an Activated Sludge Process (Biological) treatment system are analyzed in Appendix "C."

It is recommended new secondary clarifiers be constructed to serve both existing oxidation ditches and new Biological treatment system. The existing return activated sludge/waste (RAS/WAS) system and the existing clarifiers are to be removed as treatment processes or integrated as aerobic digestion and sludge thickening facilities. It is recommended a new RAS/WAS system being constructed to serve the existing oxidation ditches and new Biological treatment system.

The new RAS/WAS pumps are recommended to be progressive cavity pumps with variable speed drives. The variable speed pumps flow can be adjusted to match the centrifuge flow rates which will optimize solids thickening/dewatering.

8.5.1 Return Activated Sludge Pumping

It is recommended new RAS pumps and new WAS pumps be provided for the oxidation ditches and new STM Aerotor plant for ease of operation.

The characteristics of the two RAS systems are illustrated in Table 8-4. The RAS pumping capacity is designed to provide 150% of the average annual flow as a minimum. In all cases this provides slightly more capacity than needed as determined from a solids mass balance. The parameters of the Return Activated Sludge Pumping for future average flows of 1.2, 2.0 and 2.4 mgd are depicted in Table 8-4.

Table 8-4: Return Activated Sludge Pumping Parameters for Future Flows

Total Average Flow, mgd	1.2	2.0	2.4
Oxidation Ditch and STM Aerotor Capacity, mgd	1.2	2.0	2.4
Number of Pumps (Duty/standby)	1/1	1/1	N/A
Capacity of each, gpm	835	835	N/A
Horsepower, each	5	55	
Pump type	Vertical closed coupled		

The quantity of WAS from these treatment units is too small to pump continuously 24 hours per day and maintain reasonable velocities in the sludge piping. Minimum 6-inch diameter sludge piping is preferable. For small plants, even 6-inch diameter piping is too large. For the HPUD Wastewater Treatment Expansion, it is recommended a 4-inch diameter pipeline be used. The process design and operational factors for the activated sludge pumping initial incremental expansion is illustrated by Table 8-5.

Table 8-5: Waste Activated Sludge Pumping Process

	Average Day	Maximum Month	Maximum Day
Oxidation Ditch and STM Aerotor Capacity			
WAS gal/day	32,640	61,600	81,600
WAS Pumps (Duty/Standby)	1/1		
WAS Pump Capacity, each, gpm	200		
WAS Pump HP, each	2		
WAS Pump Run Time, min/day	162	411	542
Pump Type	Vertical Closed Couple		

The number of pumps is determined by dedicating one pump per clarifier (direct pumping from each clarifier). This will simplify operation and control and provide maximum flexibility. A standby pump will be provided as a "swing" pump designed to pump from any clarifier.

8.5.2 Modifications to Existing Oxidation Ditch Rotors

In order to maximize the capacity of the existing oxidation ditches and provide standby oxygenation capacity modifications to the existing rotors may be completed. Following are the recommended modifications:

- The West Ditch Rotors (Year 2000 ditch) are currently equipped with 20 hp motors. The motor sizes may be increased to 30 hp. Electrical modifications would be required. A review of the gear drive of the rotor for

compatibility with the electrical motor would also be required. The manufacturer of the rotor is to be contacted during this review process.

- The concrete structure of the East Ditch (Year 1981 ditch) may be repaired in areas where spalling of the concrete has occurred.

8.6 Existing Chlorination and Dechlorination

Alternatives for a Chlorination / Dechlorination and Ultraviolet (Disinfected) treatment system are analyzed in Appendix "C."

8.7 Proposed Sludge Dewatering Facilities

Sludge dewatering is accomplished by solar (air) drying, belt filter presses, plate and frame presses, screw press or centrifuges. The existing sludge drying beds are inadequate. Sludge Beds are land and labor intensive. Due to site limitations and potential odors, solar drying beds are not recommended. Plate and frame presses are typically not used on waste activated sludge because of the need for a conditioning chemical, such as lime, to be used. In addition, the presses operate on a batch mode. Plate and Frame presses are labor intensive. A Screw Press system is an acceptable option for HPUD. Screw Presses require the same area as that of a centrifuge. Package screw press units are recommended for the 1.2 mgd HPUD Expansion. Package Screw Press Units are skid mounted.

The sizing of the Packaged Screw Press Units is based on limiting the dewatering operation to a single shift on an average flow day with one unit in standby. On peak days or when there is need to dewater a maximum amount of sludge, the operation can extend beyond one shift or the standby screw press unit can be operated. To provide flexibility in the operation of the wasting and dewatering system it is recommended for two of the existing clarifiers be converted to digesters, while the other two existing clarifiers be converted to a pre-thickener and post-thickener facilities.

Characteristics of the sludge dewatering screw press system for the 1.2 mgd HPUD Wastewater Treatment Plant expansion are contained in Table 8-6:

Table 8-6: Screw Press System Process

	Average Day
Number of Screw Press units (duty/standby)	1/1
Capacity, each, gpm	60
Sludge Feed to Centrifuge, gal/day @ 2% solids	13,060
Dewatered Sludge Cake Concentration	18%
Dewatered Sludge Cake, Wet Tons/day	6
Dewatered Sludge Cake, cu yds/day	7

It is recommended the screw press be placed on a platform to allow the discharge of sludge to a dumpster or other transport vehicle. The exact details will be determined at the time the method of the sludge removal from the site is determined. It is recommended the screw press be placed in an engineered building to facilitate working in rainy or hot weather.

8.8 Proposed Electrical Facilities

As mentioned in section 7.7 the existing motor control centers (MCCs) are adequate for the existing plant, but will required to be upgraded for the 1.2 MGD expansion. The existing MCC room is to small to house the new MCCs, therefore a new pre-engineer electrical/control building will be constructed within the wastewater treatment plant site to house MCCs, automatic transfer switch and and other plant communication equipment. Also the existing emergency backup generator set and services to the wastewater plant will need to be either augmented by a new generator or replaced with a new generator set wit having adequate capacity for the entire wastewater treatment plant facilities.

8.9 SCADA System, Instrumentation and Controls

At present time the existing wastewater plant does not consist of any type of SCADA or Instrumentation and controls capabilities. It is highly recommended that the new expansion consist of some SCADA and Instrumentation and controls to provide the operators some recording and monitoring of the the wastewater process facilities. The recommend system should consist of the following:

1. Computer workstation with a designated Human Machine Interface (HMI's)
2. Plant Control Network
3. Plant Control Network interface to Programmable Logic Controllers
4. Human Machine Interface (HMI's) - The HMI software provides wastewater treatment process graphics, alarms and trending information.
5. HMI Software- Rockwell Software RS View; Wonderware intouch; Development ad runtime or equal type.

Also an upgrade to their existing automatic dialing and voice annunciation alarm management system that notifies the operators of possible plant or equipment malfunctions.

8.10 Emergency By-Pass Storage

As the 1.2 mgd expansion of the Wastewater Treatment Plant will occupy the area currently designated for the emergency overflow pond. If desired a new emergency overflow pond may be constructed on the HPUD property located to the east of the wastewater treatment plant site. Note, that a new overflow pond should have an area of approximately 1 acre by 8 feet deep, be lined with a high-density polyethylene (hdpe) liner, and be provided with a fence for security.

9 ENGINEERS OPINION OF PROBABLE COST FOR IMPROVEMENTS

9.0 ENGINEERS OPINION OF PROBABLE COST FOR IMPROVEMENTS

The Cost for the previously mentioned expansion to a 1.2 MGD Wastewater Treatment Plant Improvements is as follows:

ENGINEERS COST OF A 1.2 MGD WASTEWATER TREATMENT PLANT EXPANSION			
ITEM	**DESCRIPTION**		**COST**
1	**Improvements to Headworks Structure**		**$40,000.00**
	A Modification of Channel Monsters	$40,000.00	
2	**Improvements to Influent Pump Station**		**$128,000.00**
	A Replace three pumps	$60,000.00	
	B Retrofit fit existing Pumps with VFD Units	$40,000.00	
	C Discharge Piping	$18,000.00	
	D Replacement of Corroded Steel Hardware	$10,000.00	
3	**Headworks / RAS/WAS / MCC Building**		**$300,000.00**
	A Pre-Engineered Blower / MCC Building	$288,000.00	
	B Misc. Building Items	$12,000.00	
4	**Influent Rotary Drum Screen Facilities**		**$202,900.00**
	A Earthwork	$3,000.00	
	B Concrete Structure	$39,000.00	
	C Two Rotary Drum Screens	$150,900.00	
	D Piping / Misc. Steel	$10,000.00	
5	**Grit Removal Chamber Facilities**		**$251,000.00**
	A Earthwork	$8,000.00	
	B Concrete Structure	$23,000.00	
	C Vortex Grit Removal System	$100,000.00	
	D Grit Washer and Classifier	$95,000.00	
	E Piping / Misc. Steel	$25,000.00	
6	**Flow Splitter Structure**		**$117,000.00**
	A Earthwork	$2,000.00	
	B Concrete Structure	$10,000.00	
	C Piping / Appurtenances / Misc. Steel	$25,000.00	
	D Yard Piping	$80,000.00	
7	**Improvements to Oxidation Ditches**		**$20,000.00**
	A West Oxidation Ditch	$5,000.00	
	B East Oxidation Ditch	$15,000.00	
8	**STM Aerotor Facilities**		**$1,957,000.00**
	A Earthwork	$67,000.00	
	B Concrete Structure	$750,000.00	
	C Mechanical Equipment	$860,000.00	
	D Electrical Equipment	$280,000.00	

ENGINEERS COST OF A 1.2 MGD WASTEWATER TREATMENT PLANT EXPANSION - CONTINUED			
9	**Two Secondary Clarifiers**		**$1,090,000.00**
	A Earthwork	$120,000.00	
	B Two Concrete Structures	$540,000.00	
	C Two Weir influent and Scum Buffer	$300,000.00	
	D Misc. Steel	$20,000.00	
	E Piping / Gate / Appurtenances	$110,000.00	
10	**RAS/WAS Pump Systems**		**$137,000.00**
	A Two RAS Pumps	$30,000.00	
	B Two WAS Pumps	$52,000.00	
	C Piping	$10,000.00	
	D Misc. Steel	$20,000.00	
	E Gate Valves and Check Valves	$25,000.00	
11	**Digesters units**		**$100,000.00**
	A Demolition of existing clarifier equipment	$40,000.00	
	B Two mixer units	$20,000.00	
	C Misc. Steel / Railing / Piping	$40,000.00	
12	**Pre-thickener and Post-thickener units**		**$80,000.00**
	A Demolition of existing clarifier equipment	$40,000.00	
	B Misc. Steel / Railing / Piping	$40,000.00	
13	**Sludge Dewatering Facilities**		**$925,000.00**
	A Demolition of existing Sludge Beds	$10,000.00	
	B Engineered Building and Slab	$245,000.00	
	C Screw Press Units	$560,000.00	
	D Chemical Feed and Storage units	$20,000.00	
	E Piping	$20,000.00	
	F Misc. Steel	$60,000.00	
	G Electrical and Control Equipment	$10,000.00	
14	**Ultraviolet Disinfection Facility**		**$700,000.00**
	A Retrofit Existing Channel	$75,000.00	
	B Equipment Concrete Slab	$25,000.00	
	C Ultraviolet Disinfection Equipment	$500,000.00	
	D Electrical and Control Equipment	$100,000.00	
15	**Emergency Overflow Basin**		**$166,000.00**
	A Land	$0.00	
	B Earthwork (1 acre x 8' deep)	$120,000.00	
	C Liner	$41,000.00	
	D Piping and Valving	$5,000.00	

ENGINEERS COST OF A 1.2 MGD WASTEWATER TREATMENT PLANT EXPANSION - CONTINUED			
16	**Site Grading**		**$200,000.00**
17	**Yard Piping**		**$400,000.00**
	CONSTRUCTION COST EXCLUDING ELECTRICAL - ITEMS 1 THROUGH 17		**$6,813,900.00**
18	**Electrical / Instrumentation / Controls (20%)**		**$1,362,780.00**
	CONSTRUCTION COST - ITEMS 1 THROUGH 18		**$8,176,680.00**
	Contingency (15%)		**$1,226,502.00**
	TOTAL CONSTRUCTION COST		**$9,403,182.00**
19	**Engineer Design Fees (13%)**		**$1,222,413.66**
20	**Geotechnical Services (0.5%)**		**$47,015.91**
21	**Boundary Survey of Existing and Add'l land, Easements and ROW**		**$35,000.00**
22	**Legal / Administration**		**$15,000.00**
23	**CEQA / Environmental Consultant**		**$15,000.00**
24	**NPDES Permitting**		**$20,000.00**
	TOTAL ENGINEERING SERVICES		**$1,354,429.57**
			-
25	**Construction Services**		**$812,254.56**
	A Construction Management / Resident Engineers (7%)	$658,222.74	
	B Geotechnical Material Testing (1%)	$94,031.82	
	C Construction Staking	$45,000.00	
	D Legal / Administration	$15,000.00	
	TOTAL CONSTRUCTION AND ENGINEERING		**$11,569,866.13**

APPENDIX A

Heber Public Utility District

Proposed development within HPUD Service area:
HPUD can treat 2.02 M gal. per day (Sept. 2004).

1 single family residence = 450 gallons per day
1 multi-family unit = 80 gallons per day
School = 20 gallons per day per person (students & employees)
Parks = ? Usage per acre, Gallons per day
Commercial/Industrial Usage = gallons?

Project Name	Single Family Residential	Multi Family (Units)	Industrial, Commercial	Open Space (acres)	Schools Total Persons	Other Information
Heber Township (current)	818	59	26			*There are 10 Commercial/14 Industrial*
Heber Union Elem. School					816	*716 students/100 employees (as of 9/9/04)*
Heberwood Estates	420	162				Need the commercial estimates?
McCabe Ranch - Phase 1	173	127	9			Start 2004 - End 2006
McCabe Ranch - Phase II - V *	410	90	10	28		13 acres school site/400 students
Desert Sunrise Apartments		24				Heber Community Foundation
Correll Estates *	265			15	755	15 acre school site/650 students-105 Employees
Heber Meadows	219	146				
Heber 142 *	700	1131	45.4			
Imperial Center *			20			77.64 acres/Streets 8.61 acres
Heber Ranch **			120			600 acres/80% residential & 20% commercial
Magnolia Estates ***	23					
McCabe Cove ***	5					
Huerta & Childrens Parks			12.54			Huerta = 10.39 acres & Childrens = 2.15 acres
Totals: --->	**3,033**	**1,739**	**243**	**43**	**1,571**	

Total Single Family/Multi-Family/School: ---> 6,343

Total of all "Other Acreage": ---> 286

Total Gallons Required on Dailey Basis: ---> 1,565,720 *<--- Need to add in Commercial/Industrial & Parks.*

(This total is projected from above figures)

Heberwood Estates has already build 82 single family units, and these are counted in "Heber Township (current)".

*NOTE: *** These will eventually be serviced by El Centro.*

How many bedrooms per home? Calculation of estimated population with completed projects? Calculation of expected population w/proposed development?

What is the current population of Heber? The 2000 Census = 2,988; 1990 = 2,566 (a difference of 422 residents).

*NOTE: * As of this date it is unknown when proposed for development.*

*NOTE: ** As of this date it is proposed that 384 acres be single residence & 96 acres multi-family residence (total of 480 acres).*
How many single family residential can be placed on 384 acres (allow for streets, retention basin, etc)? And how many multi-family homes can be placed on 96 acres (also allowing for any public improvements)?.

NOTE: The impact of Industrial, Commercial, Public, Open Space and all other zoned properties can't be determined until plans for the development are submitted.

Tito Huerta Park = (6.03 + 4.36) 10.39 acres and Childrens Park = 2.15 acres.

APPENDIX B

California Regional Water Quality Control Board

Colorado River Basin Region

73-720 Fred Waring Drive, Suite 100, Palm Desert, CA 92260
Phone (760) 346-7491 • Fax (760) 341-6820
http://www.waterboards.ca.gov/coloradoriver

ORDER NO. R7-2006-0049
NPDES NO. CA0104370

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR HEBER PUBLIC UTILITIES DISTRICT OWNER/OPERATOR MUNICIPAL WASTEWATER TREATMENT PLANT AND WASTEWATER COLLECTION AND DISPOSAL SYSTEMS

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 1 Discharger Information

Discharger	Heber Public Utilities District
Name of Facility	Heber Municipal Wastewater Treatment Plant
Facility Address	1184 Rockwood Avenue
	Heber, California 92249
	Imperial County

The discharge by the Heber Municipal Wastewater Treatment Plant from the discharge point identified below is subject to waste discharge requirements as set forth in this Order:

Table 2 Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Secondary treated wastewater	32°, 44', 15" N	115°, 31', 27" W	Central Drain 3-D No. 1 *(Imperial Valley Drain)*

Table 3 Administrative Information

This Order was adopted by the Regional Water Board on:	June 21, 2006
This Order shall become effective on:	June 21, 2006
This Order shall expire on:	June 21, 2011
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Board have classified this discharge as a minor discharge.	
The Discharger shall file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of the Order expiration date as application for issuance of new waste discharge requirements.	

IT IS HEREBY ORDERED, that Order No. 00-100 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted there under, and the provisions of the Federal Clean Water Act (CWA), and regulations and guidelines adopted there under, the Discharger shall comply with the requirements in this Order.

I, Robert Perdue, Executive Officer, do hereby certify that this Order, with all attachments, is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on June 21, 2006.

Robert E Perdue

Robert Perdue, Executive Officer

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LIST OF TABLES

I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 4 Facility Information

Discharger	Heber Public Utility District
Name of Facility	Heber Municipal Wastewater Treatment Plant
Facility Address	1184 Rockwood Avenue
	Heber, California 92249
	Imperial County
Facility Contact, Title, and Phone	John Jordan, General Manager, 760-482-2440
Mailing Address	P.O. Box H, Heber, California 92249
Type of Facility	Municipal Wastewater Treatment Plant
Facility Design Flow	0.810 million gallons per day (MGD)

II. FINDINGS

The California Regional Water Quality Control Board, Colorado River Basin Region (hereinafter Regional Water Board), finds:

A. **Background.** Heber Public Utility District (hereinafter Discharger) is currently discharging under Order No. 00-100 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0104370. The Discharger submitted a Report of Waste Discharge, dated June 17, 2005, and applied for a NPDES permit renewal to discharge up to 0.810 million gallons per day (MGD) of treated wastewater from its Heber Municipal Wastewater Treatment Plant, hereinafter Facility. The application was deemed complete on March 4, 2006.

B. **Facility Description.** The Discharger owns and operates a municipal wastewater treatment plant. The treatment system consists of: a headworks consisting of two in-channel comminutors and one ultra sonic flow meter; influent pump station consisting of four non-clog centrifugal pumps; two oxidation ditches with a design capacity of 0.405 MGD each; flow splitter boxes after each oxidation ditch, which split flow between two sets of clarifiers; two pump stations, which direct sludge to the sludge drying beds; and a chlorine contact basin consisting of a chlorine disinfection system and dechlorination system.

The Facility expects to be at 80 percent of the current flow capacity by December 2006. As such, the Discharger plans to expand the current Facility during the term of this Order. Completion of the expansion is tentatively set for June of 2008.

Wastewater is discharged from Discharge Point 001 (see Table 2 on cover page) to the Central Drain 3-D No. 1, an Imperial Valley Drain, water of the United States, and tributary to the Alamo River within the Salton Sea Watershed. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

C. **Legal Authorities.** This Order is issued pursuant to Section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as a NPDES permit for point source discharges from this Facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC.

D. **Background and Rationale for Requirements**. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. Attachment F, which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E and G through I are also incorporated into this Order.

E. **California Environmental Quality Act (CEQA).** This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with Section 13389 of the CWC.

F. **Technology-based Effluent Limitations.** The Code of Federal Regulations (CFR) at 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards. This Order includes technology-based effluent limitations based on Secondary Treatment Standards at 40 CFR Part 133 and Best Professional Judgment (BPJ) in accordance with 40 CFR §125.3. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).

G. **Water Quality-based Effluent Limitations.** Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where numeric water quality objectives have not been established, 40 CFR §122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA Section 304(a), proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter.

The immediate receiving water is the Central Drain 3-D No. 1, which is a part of the Imperial Valley Drains. The 2002 USEPA 303(d) list of impaired waters (hereinafter 303(d) List) classifies the Imperial Valley Drains as impaired by sediment/silt, pesticides, and selenium. Further, the Alamo River, to which the Central Drain 3-D No. 1 is tributary, is listed as impaired by pesticides and selenium. There is an approved Total Maximum Daily Load (TMDL) for sedimentation/siltation for the Alamo River. The sediment TMDL has established a Waste Load Allocation (WLA) for sediment of twice the current Total Suspended Solids (TSS) loading rate. In addition, the 303(d) List classifies the Salton Sea as impaired by nutrients. Tributaries to the Salton Sea, including the Alamo River, may be affected by the future TMDLs. No TMDL has been developed to date, although a nutrient TMDL is under development for the Salton Sea that may have adverse impacts on permitted discharges to tributaries to the Salton Sea (Alamo River). This TMDL is tentatively scheduled for completion in 2009.

H. **Water Quality Control Plans.** The Regional Water Board adopted a Water Quality Control Plan for the Colorado River Basin (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan (includes amendments adopted by the Regional Water Board through October 2005).

The Basin Plan does not specifically identify beneficial uses for Central Drain 3-D No. 1; however, it does identify beneficial uses for the Imperial Valley Drains. The beneficial uses are listed below in Table 5, and are applicable to Central Drain 3-D No. 1.

Table 5 Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Central Drain 3-D No. 1 *(Imperial Valley Drain)*	Existing: Fresh Water Replenishment of the Salton Sea (FRSH); Water Contact Recreation (REC 1)[1,2]; Non-Contact Water Recreation (REC II) [1]; Warm Water Habitat (WARM); Wildlife Habitat (WILD); Preservation of Rare, Threatened or Endangered Species[3]

The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal* and *Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. The Thermal Plan does not apply to the Central Drain 3-D No. 1.

Requirements of this Order specifically implement the applicable Water Quality Control Plans.

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

J. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the California Toxics Rule. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005.

K. **Compliance Schedules and Interim Requirements.** Section 2.1 of the SIP provides that, based on a Discharger's request and demonstration that it is infeasible for an existing Discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion, compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under Section 5.3 of the SIP, a compliance schedule may not exceed 5 years from the date that the permit is issued or reissued, nor may it extend beyond 10 years from the effective date of the SIP (or May 18, 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation exceeds 1 year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Colorado River Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality objective. This Order includes compliance schedules and interim effluent limitations for copper and cyanide. A detailed discussion of the basis for the compliance schedules and interim effluent limitations is included in the Fact Sheet (Attachment F).

---

[1] Unauthorized Use.

[2] The only REC 1 usage that is known to occur is from infrequent fishing.

[3] Rare, endangered, or threatened wildlife exist in or utilizes some of this water way(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon the California Department of Fish and Game on its own initiative and/or at the request of the Regional Water Board; and such substantiation must be provided within a reasonable time frame as approved by the Regional Water Board.

L. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for CWA purposes (40 CFR §131.21, 65 FR 24641, April 27, 2000). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

M. **Stringency of Requirements for Individual Pollutants.** This Order contains restrictions on individual pollutants that are no more stringent than required by the Federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The technology-based effluent limitations consist of restrictions on biological oxygen demand (BOD) and total suspended solids (TSS). Restrictions on BOD and TSS are specified in Federal regulations as discussed in 40 CFR Part 125 and the Permit's technology-based pollutant restrictions are no more stringent than required by the CWA. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to Federal law and are the applicable Federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR §131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on May 18, 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under State law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR §131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

N. **Antidegradation Policy.** Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the Federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, which incorporates the requirements of the Federal antidegradation policy. Resolution 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. As discussed in detail in the Fact Sheet (Attachment F) the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

O. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and Federal regulations at 40 CFR §122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

P. **Monitoring and Reporting.** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement Federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.

Q. **Standard and Special Provisions.** Standard Provisions, which in accordance with 40 CFR §§122.41 and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

R. **Notification of Interested Parties.** The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F) of this Order.

S. **Consideration of Public Comment.** The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet (Attachment F) of this Order.

III. DISCHARGE PROHIBITIONS

A. Bypass, overflow, discharge or spill of untreated or partially treated waste is prohibited.

B. The discharge of waste to land not owned or controlled by the Discharger is prohibited.

C. Discharge of treated wastewater at a location or in a manner different from that described in Finding No. II.B, above, is prohibited.

D. The bypass or overflow of untreated wastewater or wastes to Central Drain 3-D No. 1 is prohibited, except as allowed in the Standard Provisions for National Pollutant Discharge Elimination System Permit (hereinafter Standard Provisions), included as Attachment D.

E. The Discharger shall not accept waste in excess of the Wastewater Treatment Plant design treatment capacity.

F. The discharge shall not cause degradation of any water supply.

G. The treatment or disposal of wastes from the Facility shall not cause pollution or nuisance as defined in Section 13050, subdivision (l) and (m) of the CWC.

H. Public contact with undisinfected water or wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

a. The discharge of secondary treated wastewater shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached Monitoring and Reporting Program (Attachment E):

Table 6 Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand (BOD) (5-	mg/L	30	45	---	---	---

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
day @ 20°C)	lbs/day[4]	200	300	---	---	---
Total Suspended Solids (TSS)	mg/L	30	45	---	---	---
	lbs/day[4]	200	300	---	---	---
pH	standard units	---	---	---	6.0	9.0
Daily Effluent Flow	MGD	0.810	---	---	---	---
Chlorine, Total Residual	mg/L	0.01	---	---	---	0.02
	lbs/day[4]	0.07	---	---	---	0.14
Copper, Total Recoverable[5]	µg/L	2.9	---	5.8	---	---
	lbs/day[4]	0.020	---	0.039	---	---
Lead, Total Recoverable[5]	µg/L	7.0	---	14	---	---
	lbs/day[4]	0.047	---	0.095	---	---
Zinc, Total Recoverable[5]	µg/L	47	---	95	---	---
	lbs/day[4]	0.32	---	0.64	---	---
Free Cyanide[5]	µg/L	4.3	---	8.5	---	---
	lbs/day[4]	0.029	---	0.057	---	---

b. **Percent Removal:** The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.

c. **Escherichia Coli:** Wastewater effluent discharged to the Central Drain 3-D No. 1 shall not have an Escherichia coli (E. coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 milliliters.

d. **Total Dissolved Solids:** Discharges of wastes or wastewater shall not increase the total dissolved solids content of receiving waters, unless it can be demonstrated to the satisfaction of the Regional Water Board that such an increase in total dissolved solids does not adversely affect beneficial uses of receiving waters.

e. **Toxicity:** There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the treatment plant effluent cause any acute or chronic toxicity in the receiving water, as defined in Section V.E of the Monitoring and Reporting Program (Attachment E). 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. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or bioassays of appropriate duration or other appropriate methods specified by the Regional Water Board.

[4] The mass-based effluent limitations are based on a design capacity of 0.810 MGD.
[5] Limitations are applicable after May 18, 2010. The interim effluent limitations establish in Section IV.A.2.a are applicable from June 21, 2006 through May 18, 2010.

2. Interim Effluent Limitations

a. During the period beginning June 21, 2006 and ending on May 18, 2010, the discharge of secondary treated wastewater shall maintain compliance with the following limitations at Discharger Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached Monitoring and Reporting Program (Attachment E). These interim effluent limitations shall apply in lieu of the corresponding final effluent limitations specified for the same parameters during the time period indicated in this provision.

Table 7 Interim Effluent Limitations

Parameter	Units	Interim Effluent Limitations	Interim Effluent Limitations
		Average Monthly	Maximum Daily
Copper, Total Recoverable	µg/L	21	21
	lbs/day[6]	0.14	0.14
Lead, Total Recoverable[7]	µg/L	16	16
	lbs/day[6]	0.11	0.11
Zinc, Total Recoverable[7]	µg/L	280	280
	lbs/day[6]	1.9	1.9
Free Cyanide	µg/L	10	10
	lbs/day[6]	0.68	0.68

B. Land Discharge Specifications – Not Applicable

C. Reclamation Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this Order. The discharge shall not cause the following in the Central Drain 3-D No. 1:

1. Depress the concentration of dissolved oxygen to fall below 5.0 mg/L. When dissolved oxygen in the receiving water is already below 5.0 mg/L, the discharge shall not cause any further depression.

2. The presence of oil, grease, floating material (liquids, solids, foam and scum) or suspended material in amounts that create a nuisance or adversely affect beneficial uses.

3. Result in the deposition of pesticides or combination of pesticides detectable in concentrations that adversely affect beneficial uses.

[6] The mass-based effluent limitations are based on a design capacity of 0.810 MGD.

[7] In accordance with Special Provision VI.C.2.f of this Order, the Discharger shall submit a Lead and Zinc Infeasibility Report by July 21, 2006 in order for the interim effluent limitations for lead and zinc to remain effective. If the Regional Water Board has not received the Lead and Zinc Infeasibility Report by July 21, 2006, the final effluent limitations for lead and zinc specified in Section IV.A.1.a are effective.

4. Aesthetically undesirable discoloration in the receiving water.

5. Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

6. Increase turbidity that results in adversely affecting beneficial uses.

7. The normal ambient pH to fall below 6.0 or exceed 9.0 standard units.

8. The natural receiving water temperature of surface waters shall not be altered by discharges of wastewater unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.

9. Result in the deposition of material that causes nuisance or adversely affects beneficial uses.

10. No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.

11. 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.

12. Taste or odor-producing substances that adversely affect beneficial uses.

13. This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Regional Water Board or the State Water Board as required by the Federal CWA and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal CWA or amendments thereto, the Regional Water Board will revise and modify this Permit in accordance with such more stringent standards.

14. The concentration of total dissolved solids in Central Drain 3-D No. 1 to exceed an annual average concentration of 4,000 mg/L or an instantaneous maximum concentration of 4,500 mg/L.

B. Groundwater Limitations

1. The discharge shall not cause the underlying groundwater to be degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

VI. PROVISIONS

A. Standard Provisions

1. **Federal Standard Provisions.** The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. **Regional Water Board Standard Provisions.** The Discharger shall comply with the following provisions:

   a. The Facility shall be protected from any washout or erosion of wastes or covering material, and from any inundation, which could occur as a result of floods having a predicted frequency of once in 100 years.

b. The Discharger shall comply with all conditions of this Order. Noncompliance constitutes a violation of the Federal CWA and Porter-Cologne Water Quality Control Act, and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification of waste discharge requirements; or denial of a Permit renewal application.

c. The Discharger shall ensure that all site-operating personnel are familiar with the content of this Order, and shall maintain a copy of this Order at the site.

d. The Discharger's wastewater treatment plant shall be supervised and operated by persons possessing certification of appropriate grade pursuant to Section 3680, Chapter 26, Division 3, Title 23 of the California Code of Regulations. The Discharger shall ensure that all operating personnel are familiar with the contents of this Order.

e. The Discharger shall immediately report orally information of any noncompliance that may endanger human health or the environment as soon as (1) the Discharger has knowledge of the discharge, (2) notification is possible, and (3) notification can be provided without substantially impeding cleanup or other emergency measures, to the Regional Water Board office and the Office of Emergency Services. During non-business hours, the Discharger shall leave a message on the Regional Water Board office voice recorder, phone number is (760) 346-7491. A written report shall also be provided within five (5) business days of the time the Discharger becomes aware of the incident. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, the anticipated time to achieve full compliance, and the steps taken or planned, to reduce, eliminate, and prevent recurrence of the noncompliance. The Discharger shall report all intentional or unintentional spills in excess of one thousand (1,000) gallons occurring within the Facility or collection system to the Regional Water Board office in accordance with the above time limits.

f. The Discharger shall provide a report to the Regional Water Board upon determining that the treatment plant's monthly average flow rate for any month exceeds 80 percent of the current design treatment capacity, specified in Finding No. II.A above. The report should indicate what steps, if any the Discharger intends to take to provide for the expected wastewater treatment capacity necessary when the plant reaches design capacity.

g. Prior to any change in ownership or management of this operation, the Discharger shall transmit a copy of this Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Regional Water Board.

h. Prior to any modifications in this Facility, which would result in material change in the quality or, quantity of wastewater treated or discharged, or any material change in the location of discharge, the Discharger shall report all pertinent information in writing to the Regional Water Board and obtain revised requirements before any modifications are implemented.

i. Adequate measures shall be taken to assure that flood or surface drainage waters do not erode or otherwise render portions of the discharge facilities inoperable.

j. This Order does not authorize violation of any Federal, State, or local laws or regulations.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto as specified by the Regional Water Board's Executive Officer, found in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

a. The Discharger shall submit data sufficient to determine if a water quality–based effluent limitation is required in the discharge permit as required under the SIP. It is the Discharger's responsibility to provide all information requested by the Regional Water Board for use in the analysis. This Permit shall be reopened to establish water quality-based effluent limitations, if necessary.

b. This Order may be reopened and revised effluent limitations shall be established following the completion of the plant expansion in accordance with 40 CFR §122.62. It is the Discharger's responsibility to provide all information requested by the Regional Water Board for use in the revision of effluent limitations.

c. This Order may be modified, rescinded and reissued, for cause. The filing of a request by the Discharger for an Order modification, rescission and reissuance, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. Causes for modification include the promulgation of new regulations, modification of land application plans, or modification in sludge use or disposal practices, or adoption of new regulations by the State Water Board or the Regional Water Board, including revisions to the Basin Plan.

d. The CWA requires the Regional Water Board to modify, or terminate and reissue, the NPDES permit if a discharger must implement a pretreatment program. Public notice and a comment period are mandatory.

e. This Order may be reopened and the Whole Effluent Toxicity (WET) Testing Requirements, contained in the Attachment E, Monitoring and Reporting Program, Section V may be modified to address changes to USEPA or State Water Board policies or guidance regarding the testing or reporting requirements for WET testing.

f. TMDLs for nutrients, pesticides, and selenium are to be developed by the Regional Water Board. The permit may be reopened and modified in the future to include appropriate requirements necessary to fully implement the approved TMDL if needed.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Toxicity Identification Evaluations or Toxicity Reduction Evaluations.** The Discharger shall submit to the Regional Water Board a toxicity reduction evaluation (TRE) work plan (1-2 pages) within 90 days of the effective date of this Permit. This plan shall describe the steps the Discharger intends to follow in the event that toxicity is detected, and should include at a minimum:

1) A description of the investigation and evaluation techniques that will be used to identify potential causes/sources of toxicity, effluent variability, and treatment system efficiency;

2) A description of the Facility's method of maximizing in-house treatment efficiency and good housekeeping practices, and a list of all chemicals used in operation of the Facility;

3) If a toxicity identification evaluation (TIE) is necessary, who will conduct it (i.e., in-house or outside consultant).

b. **Translator Study.** In addition, should the Discharger request to use a translator for metals and selenium different than the USEPA conversion factor, it shall complete a translator study within two years from the date of the issuance of this permit as stated in the SIP. In the event a translator study is not completed within the specified time, the USEPA conversion factor-based effluent limitation as specified in the CTR shall be effective as a default limitation.

c. **Antidegradation Analysis and Engineering Report for Proposed Plant Expansion.** All proposed changes to the facility that will result in the increase in flows, facility changes, and/or change in the nature and character of the discharge, must be reviewed and approved by the Executive Officer, prior to the start of construction of changes to the treatment facility. The Discharger shall submit a technical report that provides an analysis and justification to support the proposed plant expansion and improvement project. At a minimum, the report will evaluate treatment capacity, address mass increases of pollutants discharged, and propose additional units as necessary to enable adequate treatment. The report shall include time schedules for the ongoing and planned projects and address project status. The report shall also include documentation that any proposed increases in discharges will not violate the State Water Board's antidegradation policy. This analysis is necessary before the Regional Water Board will consider approving any adjustment in effluent limitations.

d. **Operations Plan for Proposed Plant Expansion.** At least 30 days in advance of the operation of the new treatment systems the Discharger shall submit an Operations Plan in accordance with Section 13385(j)(1)(D) of the CWC. The Operations Plan will describe the actions the Discharger will take during the period of adjusting or testing, including steps to prevent violations and identifies the shortest reasonable time required for the period of adjusting and testing, not to exceed 90 days. Upon written acceptance of the Operations Plan by the Executive Officer, Sections 13385(h) and 13385(i) of the CWC do not apply, in accordance with Section 13385(j)(1) of the CWC, if a violation is caused by the operation or a new or reconstructed wastewater treatment unit during a defined period of adjusting or testing, not to exceed 90 days.

e. **Total Dissolved Solids Study**. The Discharger shall perform a study to evaluate whether a 400 mg/L incremental increase in salinity above the source water is practical and if not, what incremental increase is practical for their discharge. This report shall be submitted to the Regional Board's Executive Officer prior to the filing date for re-application. The following items describe the purpose and description of the minimum requirements for the report:

1) The permitting authority may permit a discharge in excess of the 400 mg/L incremental increase at the time of issuance or reissuance of a NPDES discharge permit, upon satisfactory demonstration by the permittee that it is not practicable to attain the 400 mg/L limit.

2) Demonstration by the applicant must include information on the following factors relating to the potential discharge:

(a) Description of the municipal entity and facilities.

(b) Description of the quantity and salinity of various waste streams into the collection system and contributing to TDS of the discharge.

(c) Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

(d) Description of water rights, including diversions and consumptive use quantities.

(e) Description of the wastewater discharge, receiving waters, quantity, salt load, and salinity.

(f) Alternative plans for minimizing salt contribution from the various sources affecting the TDS of the discharge. Alternative plans should include:

(1) Description of system salt sources and alternative means of control; and

(2) Cost of alternative plans in dollars per ton, of salt removed from discharge

(g) Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.

3) In determining what permit conditions shall be required, the permit issuing authority shall consider the following criteria including, but not limited to:

(a) The practicability of achieving the 400 mg/L incremental increase.

(b) Where the 400 mg/L incremental increase is not determined to be practicable, the discharger shall provide the following:

(1) The impact of the proposed salt input of each alternative on the beneficial uses of the surface water in terms of tons per year and concentration;

(2) Costs per ton of salt removed from discharge of each alternative plan;

(3) Capability of minimizing the salt discharge;

(4) A proposed value for the practical incremental increase; and

(5) A justification for the proposed practical incremental increased value; including justification that it would not affect beneficial uses or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Following review of the report, this permit may be re-opened to establish an appropriate TDS effluent limit.

f. **Lead and Zinc Infeasibility Report.** The Discharger shall submit to the Regional Water Board an Infeasibility Report for lead and zinc within 30 days of the effective date of this Order. If the Regional Water Board has not received the Infeasibility Report for lead and zinc by July 21, 2006, the final effluent limitations for lead and zinc, specified in Effluent Limitations, IV.A.1.a. of this Order are effective. The Infeasibility Report for lead and zinc shall provide:

1) Documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts;

2) Documentation of source control and/or pollution minimization efforts currently underway or completed;

3) A proposed schedule for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and

4) A demonstration that the proposed schedule is as short as practicable.

3. Best Management Practices and Pollution Prevention

a. Pollutant Minimization Program

Reporting protocols in the Monitoring and Reporting Program, Attachment E, Section X.B.4 describe sample results that are to be reported as Detected but Not Quantified (DNQ) or Not Detected (ND). Definitions for a Minimum Level (ML) and Method Detection Limit (MDL) are provided in Attachment A. A Reporting Level (RL) is the ML associated with an analytical method selected by the Discharger that is authorized for monitoring effluent limitations under this Order. These reporting protocols and definitions are used in determining the need to conduct a Pollution Minimization Program (PMP) as follows:

1) In accordance with Section 2.4.5 of the SIP, the Discharger shall be required to develop and conduct a Pollutant Minimization Program (PMP) as further described below when there is evidence (e.g., sample results reported as DNQ when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods required by this Order, presence of whole effluent toxicity, health advisories for fish consumption, results of benthic or aquatic organism tissue sampling) that a priority pollutant is present in the effluent above an effluent limitation and either:

   (a) A sample result is reported as DNQ and the effluent limitation is less than the RL; or

   (b) A sample result is reported as ND and the effluent limitation is less than the MDL.

2) The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost-effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to CWC Section 13263.3(d), shall be considered to fulfill the PMP requirements.

   The PMP shall include, but not be limited to, the following actions and submittals acceptable to the Regional Water Board:

   (a) An annual review and semi-annual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling;

   (b) Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system;

   (c) Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant(s) in the effluent at or below the effluent limitation;

   (d) Implementation of appropriate cost-effective control measures for the reportable priority pollutant(s), consistent with the control strategy; and

   (e) An annual status report that shall be sent to the Regional Water Board including:

      (1) All PMP monitoring results for the previous year;

      (2) A list of potential sources of the reportable priority pollutant(s);

(3) A summary of all actions undertaken pursuant to the control strategy; and

(4) A description of actions to be taken in the following year.

b. **Storm Water**

1) In the event that there are storm water discharges associated with industrial activities, the Discharger shall submit a Notice of Intent to be covered under the General Storm Water Permit and/or maintain coverage under the General Storm Water Permit.

(a) All storm water discharges from this Facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies, regarding discharges of storm water to storm water drain systems or other courses under their jurisdiction.

(b) Storm water discharges from the Facility shall not cause or threaten to cause pollution or contamination.

(c) Storm water discharges from the Facility shall not contain hazardous substances equal to or in excess of a reportable quantity listed in 40 CFR Part 117 and/or 40 CFR Part 302.

4. Construction, Operation and Maintenance Specifications

a. **Facility and Treatment Operation**

1) The Discharger shall, at all times, properly operate and maintain all systems and components of collection, treatment and control which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance includes effective performance, adequate process controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of this Order. All systems both in service and reserved, shall be inspected and maintained on a regular basis. Records shall be kept of the inspection results and maintenance performed and made available to the Regional Water Board upon demand.

2) Temporary power shall be provided to maintain the plant in operation in the event of commercial power failure.

3) The Discharger shall ensure proper sampling equipment is installed and operational to ensure compliance with monitoring and reporting protocols (i.e., continuous monitoring) in the Monitoring and Reporting Program, Attachment E, Section IV.A.1, for total residual chlorine.

Table 8 Total Residual Chlorine Compliance Schedule

Task	Completion Date
Submit a work plan to investigate sampling techniques appropriate to comply with the continuous monitoring requirements for total residual chlorine. The work plan shall describe current sampling procedures for total residual chlorine. Further, the work plan shall discuss planned activities to obtain, install, and operate sampling equipment to ensure compliance with the monitoring requirements for total residual chlorine.	Within 30 days of the effective date of the Order.

Task	Completion Date
Submit a timeframe for acquiring and installing proper sampling equipment to ensure compliance with continuous monitoring requirements for total residual chlorine.	Within 90 days of the effective date of the Order.
Submit a Startup Plan to describe the actions the Discharger will take during the period of adjusting or testing, including steps to prevent violations and identifies the shortest reasonable time required for the period of adjusting and testing, not to exceed 90 days.	Within 3 months of the effective date of the Order.
Commence continuous monitoring for total residual chlorine.	Within 9 months of the effective date of the Order.

b. **Spill Response Plan**

1) The Discharger shall review its current Spill Response Plan (SRP) developed under previous Order 00-100 and revise if needed within 60 days after the effective date of this Order. Revised plans shall be submitted for Regional Water Board staff review. Thereafter, the plan shall be updated annually, and shall be available for staff review during Regional Water Board inspections. The Discharger shall ensure that all operating personnel are familiar with the contents of the SRP. A copy of the SRP shall be maintained at the site and shall be accessible to all operating personnel.

c. Adequate measures shall be taken to assure that unauthorized persons are effectively excluded from contact with the wastewater disposal facilities.

5. Special Provisions for Municipal Facilities (POTWs Only)

a. **Sludge Disposal Requirements**

1) The Discharger shall provide a plan as to the method, treatment, handling and disposal of sludge that is consistent with all State and Federal laws and regulations and obtain prior written approval from the Regional Water Board specifying location and method of disposal, before disposing of treated or untreated sludge, or similar solid waste materials using an alternative method than that described in the Findings of the Order.

2) The Discharger shall maintain a permanent log of all solids hauled away from the treatment Facility for use/disposal elsewhere and shall provide a summary of the volume, type (screenings, grit, raw sludge, digested sludge), use (agricultural, composting, etc.), and the destination in accordance with the Monitoring and Reporting Program of this Order. The sludge that is stockpiled at the treatment Facility shall be sampled and analyzed for those constituents listed in the sludge monitoring Section of the Monitoring and Reporting Program of this Order and as required by 40 CFR Part 503. The results of the analyses should be submitted to the Regional Water Board as part of the Monitoring and Reporting Program.

3) All sludge generated at the wastewater treatment plant will be disposed, treated, or applied to land in accordance with Federal Regulations 40 CFR 503.

4) Collected screenings, sludge, and other solids removed from liquid wastes shall be disposed of in a manner that is consistent with State Water Board and Integrated Waste Management Board's joint regulations (Title 27) of the California Code of Regulations and approved by the Regional Water Board's Executive Officer.

b. **Pretreatment**

1) In the event that (i) the Facility has a treatment capacity greater than 5 MGD and Industrial Users [40 CFR 403.3(h) are discharging pollutants which Pass Through [40 CFR 403.3(n)] or Interfere [40 CFR 403.3(i)] with the operation of the wastewater treatment Facility or are otherwise subject to National Pretreatment Standards [40 CFR 403.3(j)], (ii) Cal. Code of Regulations, Title 23, Section 2233 requires the Facility to have and enforce an adequate pretreatment program, or (iii) the Regional Water Board or its Executive Officer determines that other circumstances warrant in order to prevent Interference with the wastewater treatment Facility or Pass Through, then:

(a) The Discharger shall be responsible for the performance of all pretreatment requirements contained in the Section 403 of 40 CFR, and shall be subject to enforcement actions, penalties, and other remedies by the USEPA, or the Regional Water Board, as provided in the Federal CWA, as amended (33 USC 1251 et. seq.) (hereafter "Act").

(b) Within 365 days of the significant industrial wastewaters being discharged to the wastewater treatment plant, the Discharger shall seek a formal approval of its Pretreatment Plan, from the Regional Water Board.

(c) The Discharger must seek approval of its Pretreatment Program from the Regional Water Board in the event a Pretreatment Program is developed.

6. Other Special Provisions

a. The Discharger may be required to submit technical reports as directed by the Regional Water Board's Executive Officer.

b. The Discharger shall exclude from the wastewater treatment plant any liquid or solid waste that could adversely affect the plant operation or effluent quality. The excluded liquid or solid waste shall be disposed of in accordance with applicable regulations.

7. Compliance Schedules

a. **Compliance Plan.** The Discharger shall implement a compliance plan, to be submitted to the Regional Water Board by June 21, 2007 that identifies the measures that will be taken to reduce the concentrations of copper, lead, zinc, and cyanide in their discharge to achieve compliance with the permit limitations specified in Effluent Limitations, IV.A.1.a. of this Order.

b. **Compliance Plan Annual Reports.** The Discharger shall submit annual progress reports to describe the progress of studies and or actions undertaken to reduce copper, lead, zinc, and cyanide in the effluent, and to achieve compliance with the limitations in this Order by the deadline specified in Section IV.A.2.a., as outlined in Table 9 below. The Regional Water Board shall receive the first annual progress report at the same time the annual summary report is due, as required in Section X.B.3 of MRP in Attachment E.

Table 9 Compliance Schedule

Activity	Description/Milestone	Due Date
Task 1	Submit to the Regional Water Board a Plan of Study ("Compliance Plan") to determine the source of toxics in the discharge and to identify source control, operating practices, design features, and/or treatment technologies to attain compliance with effluent limitations for toxics established by IV.A.1.a of this Order.	12 months after the Permit effective date
Task 2	Initiate detailed study of selected alternatives.	18 months after the Permit effective date
Task 3	Submit to the Regional Board a Summary Report of the detailed evaluation of selected alternatives. The Summary Report shall identify the source control measures, operating practices, design features, and/or treatment technologies, which will be implemented by the Discharger to attain compliance with final effluent limitations of this Order for toxic pollutants. The Summary Report shall include a time schedule, which will be subject to Regional Board approval, to implement the chosen alternative(s). The time schedule shall be as short as reasonable to fully implement the chosen alternative(s).	36 months after the Permit effective date
Task 4	Implement the chosen alternative(s) to meet effluent limitations for toxic pollutants.	May 18, 2010

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined in the Monitoring and Reporting Program (Attachment E) of this Order. Dischargers shall be deemed out of compliance with effluent limitations if the concentration of the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

B. Multiple Sample Data Reduction.

When determining compliance with an Average Monthly Effluent Limitation (AMEL) for priority pollutants and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

C. Effect of Conducting a Pollutant Minimization Program (PMP).

If a sample result for a priority pollutant, or the arithmetic mean or median of multiple sample results is below the RL, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a PMP for the priority pollutant (as described in Provision VI.C.3), the Discharger shall not be deemed out of compliance.

D. Average Monthly Effluent Limitation (AMEL).

If the average of daily discharges over a calendar month exceeds the AMEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). The average of daily discharges over the calendar month that exceeds the AMEL for a parameter will be considered out of compliance for that month only. If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that calendar month. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

E. Average Weekly Effluent Limitation (AWEL).

If the average of daily discharges over a calendar week exceeds the AWEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for each day of that week for that parameter, resulting in 7 days of non-compliance. The average of daily discharges over the calendar week that exceeds the AWEL for a parameter will be considered out of compliance for that week only. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance for that calendar week. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week.

F. Maximum Daily Effluent Limitation (MDEL).

If a daily discharge exceeds the MDEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

G. Instantaneous Minimum Effluent Limitation.

If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, a violation will be flagged and the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

H. Instantaneous Maximum Effluent Limitation.

If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, a violation will be flagged and the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

I. Six-month Median Effluent Limitation.

If the median of daily discharges over any 180-day period exceeds the six-month median effluent limitation for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for each day of that 180-day period for that parameter. The next assessment of compliance will occur after the next sample is taken. If only a single sample is taken during a given 180-day period and the analytical result for that sample exceeds the six-month median, the Discharger will be considered out of compliance for the 180-day period. For any 180-period during which no sample is taken, no compliance determination can be made for the six-month median limitation.

J. Water Quality-Based Effluent Limitations.

1. In accordance with Section 2.4.5 of the SIP, compliance with water quality-based effluent limitations shall be determined as follows:

    a. Dischargers shall be deemed out of compliance with an effluent limitation if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

    b. When determining compliance with an average monthly effluent limitation and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

        1) The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, and followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

        2) The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

If a sample result, or the arithmetic mean or median of multiple sample results, is below the reported ML, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a PMP, the Discharger shall not be deemed out of compliance.

K. Mass and Concentration Limitation.

Compliance with mass and concentration effluent limitations for the same parameter shall be determined separately with their respective limitations. When the concentration of a constituent in an effluent sample is determined to be ND or DNQ, the corresponding mass emission rate (MER) determined from that sample concentration shall also be reported as ND or DNQ.

L. Percent Removal.

Compliance with the secondary treatment standard for monthly average percent removal of biochemical oxygen demand, and total suspended solids pursuant to 40 CFR Part 133 shall be determined separately for each wastewater treatment Facility discharging through an outfall. For each wastewater treatment Facility, the monthly average percent removal is the average of the calculated daily discharge percent removals only for days on which the constituent concentrations is monitored in both the influent and effluent of the wastewater treatment Facility at locations specified in the Monitoring and Reporting Program (Attachment E) within a calendar month.

The percent removal for each day shall be calculated according to the following equation:

Daily discharge percent removal
= ((Influent concentration – Effluent concentration)/ Influent Concentration) X 100%

M. State Water Board Water Quality Enforcement Policy.

1. Acute and Chronic Narrative Effluent Limitations

   a. Compliance with whole effluent toxicity (WET) limitations established in the Order shall be determined in accordance with Section III.B of the State Water Board's Water Quality Enforcement Policy.

ATTACHMENT A – DEFINITIONS

Acutely Toxic Conditions, as used in the context of mixing zones, refers to lethality that occurs to mobile aquatic organisms that move or drift through the mixing zone.

Arithmetic Mean (μ): also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL): the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs): BMPs are methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges including storm water. BMPs include structural and non-structural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

Bioaccumulative Pollutants are those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Biologically-Based Receiving Water Flow refers to the method for determining receiving water flows developed by the USEPA Office of Research and Development which directly uses the averaging periods and exceedance frequencies specified in the acute and chronic aquatic life criteria for individual pollutants (e.g., 1 day and 3 years for acute criteria, and 4 days and 3 years for the chronic criteria). Biologically-based flows can be calculated using the program DFLOW.

Carcinogenic Pollutants are substances that are known to cause cancer in living organisms.

Coefficient of Variation (*CV*): CV is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Completely-Mixed Discharge: A Completely-Mixed Discharge condition means not more than a 5 percent difference, accounting for analytical variability, in the concentration of a pollutant exists across a transect of the water body at a point within two stream/river widths from the discharge point.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Dilution Ratio is the critical low flow of the upstream receiving water divided by the flow of the effluent discharged.

Discharger-Specific Water Effect Ratio (WER): A WER that is applied to individual pollutant limits in an NPDES permit issued to a particular permit holder. A Discharger-specific WER applies only to the applicable limits in the Discharger's permit. Discharger-specific WERs are distinguished from WERs that are developed on a waterbody or watershed basis as part of a water quality standards action resulting in adoption of a Site Specific Objective.

Dynamic Models used for calculating effluent limitations predict the effects of receiving water and effluent flow and of concentration variability. The outputs of dynamic models can be used to base effluent limitations on probability estimates of receiving water concentrations rather than critical conditions (which are used in the steady-state model). The three dynamic modeling techniques recommended by the USEPA for calculating effluent limitations are continuous simulation, Monte Carlo simulation, and lognormal probability modeling.

Effluent Concentration Allowance (ECA) is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in USEPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration: The estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries: Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code Section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Existing Discharger means any Discharger that is not a new Discharger. An existing Discharger includes an "increasing Discharger" (i.e., an existing Facility with treatment systems in place for its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after the effective date of this Order).

Four-Day Average of Daily Maximum Flows is the average of daily maximums taken from the data set in four-day intervals.

Harmonic Mean flows are expressed as $Q_{hm} = (n)/(\Sigma^{n}_{i=1}\ 1/x_i)$, where x_i = specific data values and n = number of data values.

Incompletely-Mixed Discharge: A Incompletely-Mixed Discharge is a discharge that contributes to a condition that does not meet the meaning of a completely-mixed discharge condition.

Infeasible: Infeasible means not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Inland Surface Waters: Inland Surface Waters are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Load Allocation (LA) is the portion of a receiving water's total maximum daily load that is allocated to one of its nonpoint sources of pollution and/or to natural background sources.

Long-Term Arithmetic Mean Flow is at least two years of flow data used in calculating an arithmetic mean as defined in Attachment A.

Maximum Daily Effluent Limitation (MDEL): the highest allowable daily discharge of a pollutant.

Maximum Daily Flow: the maximum flow value in a calendar day.

Median: the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X(n+1)/2$. If n is even, then the median = $(Xn/2 + X(n/2)+1)/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL): The MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR 136, Appendix B, revised as of May 14, 1999.

Minimum Level (ML): The ML is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Minimum Level Usage: The ML value in Appendix 4 represents the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences. Assuming that all method-specific analytical steps are followed, the ML value will also represent, after the appropriate application of method-specific factors, the lowest standard in the calibration curve for that specific analytical technique. Common analytical practices sometimes require different treatment of the sample relative to calibration standards.

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Mutagenic Pollutants are substances that are known to cause a mutation (i.e., change in a gene or chromosome) in living organisms.

Mutual Water Company is defined in the California Public Utilities Code, section 2725 as: "any private corporation or association organized for the purpose of delivering water to its stockholders and members at cost, including use of works for conserving, treating and reclaiming water".

New Discharger includes any building, structure, Facility, or installation from which there is, or may be, a discharge of pollutants, the construction of which commenced after the effective date of this Order.

Objectionable Bottom Deposits are an accumulation of materials or substances on or near the bottom of a water body, which creates conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments and other conditions that result in harm to benthic organisms, production of food chain organisms, or fish egg development. The Regional Water Board shall determine the presence of such deposits on a case-by-case basis.

Ocean Waters are the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the SWRCB's California Ocean Plan.

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization: Pollutant Minimization means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses.

Pollution Prevention: Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code Section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the SWRCB or REGIONAL WATER BOARD.

Process Optimization means minor changes to the existing Facility and treatment plant operations that optimize the effectiveness of the existing treatment processes.

Public Entity includes the Federal government or a state, county, city and county, city, district, public authority, or public agency.

Reportable Level (RL): The RL is selected from the MLs listed in Appendix 4 in accordance with Section 2.4.2 or established in accordance with Section 2.4.3 of the State Implementation Policy.

Reporting Level Selection: When there is more than one ML value for a given substance, the REGIONAL WATER BOARD shall include as RLs, in the permit, all ML values, and their associated analytical methods, listed in Appendix 4 of the State Implementation Policy that are below the calculated effluent limitation. The Discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the REGIONAL WATER BOARD shall select as the RL, the lowest ML value, and its associated analytical method, listed in Appendix 4 for inclusion in the permit.

Six-month Median Effluent Limitation: the highest allowable moving median of all daily discharges for any 180-day period.

Source of Drinking Water is any water designated as municipal or domestic supply (MUN) in a REGIONAL WATER BOARD basin plan.

Standard Deviation (σ) is a measure of variability that is calculated as follows:

$\sigma = (\sum [(x - \mu)2]/(n - 1))0.5$

where:
x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

State Implementation Policy (SIP): The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

Teratogenic Pollutants are substances that are known to cause structural abnormalities or birth defects in living organisms.

Toxicity Reduction Evaluation (TRE): The TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of Facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

Use Attainability Analysis: A Use Attainability Analysis is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological and economic factors as described in 40 CFR 131.10(g) (40 CFR 131.3, revised as of July 1, 1997).

Water Effect Ratio (WER): A WER is an appropriate measure of the toxicity of a material obtained in a site water divided by the same measure of the toxicity of the same material obtained simultaneously in a laboratory dilution water.

1Q10: is the lowest flow that occurs for one day with a statistical frequency of once every 10 years.

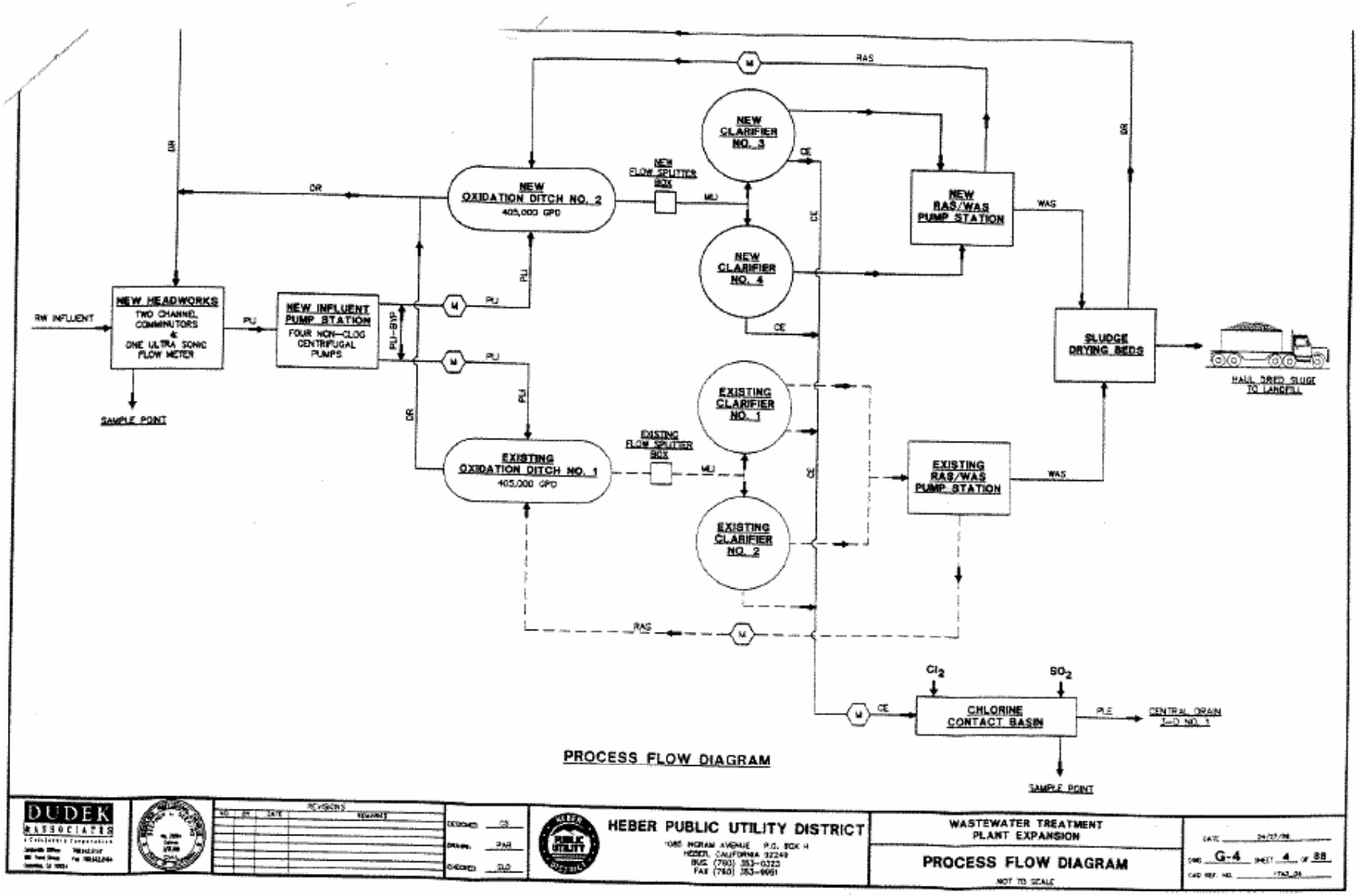
7Q10: is the average low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years.

90th PERCENTILE OF OBSERVED DATA: the measurement in the ordered set of data (lowest to highest) where 90 percent of the reported measurements are less than or equal to that value.

ATTACHMENT B – AREA MAP

HEBER PUBLIC UTILITIES DISTRICT
WASTEWATER TREATMENT PLANT
Heber - Imperial County
Facility Location - Section 28, T16S, R14E, SBB&M
Discharge to Central Drain 3-D No. 1 - N32º 44' 15" W115º 31' 27"

ATTACHMENT C – FLOW SCHEMATIC



ATTACHMENT D – FEDERAL STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or denial of a permit renewal application [*40 CFR §122.41(a)*].

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not been modified to incorporate the requirement [*40 CFR §122.41(a)(1)*].

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order [*40 CFR §122.41(c)*].

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment [*40 CFR §122.41(d)*].

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [*40 CFR §122.41(e)*].

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges [*40 CFR §122.41(g)*].

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations [*40 CFR §122.5(c)*].

F. Inspection and Entry

The Discharger shall allow the Regional Water Quality Control Board (REGIONAL WATER BOARD), State Water Resources Control Board (SWRCB), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [*40 CFR §122.41(i)*] [*CWC 13383(c)*]:

1. Enter upon the Discharger's premises where a regulated Facility or activity is located or conducted, or where records are kept under the conditions of this Order [*40 CFR §122.41(i)(1)*];

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [*40 CFR §122.41(i)(2)*];

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [*40 CFR §122.41(i)(3)*];

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location [*40 CFR §122.41(i)(4)*].

G. Bypass

1. Definitions

   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment Facility [*40 CFR §122.41(m)(1)(i)*].

   b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [*40 CFR §122.41(m)(1)(ii)*].

2. Bypass not exceeding limitations – The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3 and I.G.5 below [*40 CFR §122.41(m)(2)*].

3. Prohibition of bypass – Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless [*40 CFR §122.41(m)(4)(i)*]:

   a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [*40 CFR §122.41(m)(4)(A)*];

   b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [*40 CFR §122.41(m)(4)(B)*]; and

   c. The Discharger submitted notice to the Regional Water Board as required under Standard Provision – Permit Compliance I.G.5 below [*40 CFR §122.41(m)(4)(C)*].

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above [*40 CFR §122.41(m)(4)(ii)*].

5. Notice

   a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [*40 CFR §122.41(m)(3)(i)*].

   b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below [*40 CFR §122.41(m)(3)(ii)*].

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [*40 CFR §122.41(n)(1)*].

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph H.2 of this Section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [*40 CFR §122.41(n)(2)*].

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [*40 CFR §122.41(n)(3)*]:

   a. An upset occurred and that the Discharger can identify the cause(s) of the upset [*40 CFR §122.41(n)(3)(i)*];

   b. The permitted Facility was, at the time, being properly operated [*40 CFR §122.41(n)(3)(i)*];

   c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b [*40 CFR §122.41(n)(3)(iii)*]; and

   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above [*40 CFR §122.41(n)(3)(iv)*].

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [*40 CFR §122.41(n)(4)*].

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition [*40 CFR §122.41(f)*].

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [*40 CFR §122.41(b)*].

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC [*40 CFR §122.41(l)(3)*] [*40 CFR §122.61*].

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [*40 CFR §122.41(j)(1)*].

B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [*40 CFR §122.41(j)(4)*] [*40 CFR §122.44(i)(1)(iv)*].

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time [*40 CFR §122.41(j)(2)*].

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements [*40 CFR §122.41(j)(3)(i)*];
2. The individual(s) who performed the sampling or measurements [*40 CFR §122.41(j)(3)(ii)*];
3. The date(s) analyses were performed [*40 CFR §122.41(j)(3)(iii)*];
4. The individual(s) who performed the analyses [*40 CFR §122.41(j)(3)(iv)*];
5. The analytical techniques or methods used [*40 CFR §122.41(j)(3)(v)*]; and
6. The results of such analyses [*40 CFR §122.41(j)(3)(vi)*].

C. Claims of confidentiality for the following information will be denied [*40 CFR §122.7(b)*]:

1. The name and address of any permit applicant or Discharger [*40 CFR §122.7(b)(1)*]; and
2. Permit applications and attachments, permits and effluent data [*40 CFR §122.7(b)(2)*].

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, SWRCB, or USEPA within a reasonable time, any information which the Regional Water Board, SWRCB, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, SWRCB, or USEPA copies of records required to be kept by this Order [*40 CFR §122.41(h)*] [*CWC 13267*].

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, SWRCB, and/or USEPA shall be signed and certified in accordance with paragraph (2.) and (3.) of this provision [*40 CFR §122.41(k)*].

2. All permit applications shall be signed as follows:

   a. For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated Facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures [*40 CFR §122.22(a)(1)*];

   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively [*40 CFR §122.22(a)(2)*]; or

   c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a Federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA) [*40 CFR §122.22(a)(3)*].

3. All reports required by this Order and other information requested by the Regional Water Board, SWRCB, or USEPA shall be signed by a person described in paragraph (b) of this provision, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in paragraph (2.) of this provision [*40 CFR §122.22(b)(1)*];

   b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated Facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position) [*40 CFR §122.22(b)(2)*]; and

c. The written authorization is submitted to the Regional Water Board, SWRCB, or USEPA [*40 CFR §122.22(b)(3)*].

4. If an authorization under paragraph (3.) of this provision is no longer accurate because a different individual or position has responsibility for the overall operation of the Facility, a new authorization satisfying the requirements of paragraph (3.) of this provision must be submitted to the Regional Water Board, SWRCB or USEPA prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].

5. Any person signing a document under paragraph (2.) or (3.) of this provision shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations" [*40 CFR §122.22(d)*].

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program in this Order [*40 CFR §122.41(l)(4)*].

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or SWRCB for reporting results of monitoring of sludge use or disposal practices [*40 CFR §122.41(l)(4)(i)*].

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board [*40 CFR §122.41(l)(4)(ii)*].

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [*40 CFR §122.41(l)(4)(iii)*].

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [*40 CFR §122.41(l)(5)*].

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [*40 CFR §122.41(l)(6)(i)*].

2. The following shall be included as information that must be reported within 24 hours under this paragraph [*40 CFR §122.41(l)(6)(ii)*]:

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(A)*].

   b. Any upset that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(B)*].

   c. Violation of a maximum daily discharge limitation for any of the pollutants listed in this Order to be reported within 24 hours [*40 CFR §122.41(l)(6)(ii)(C)*].

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [*40 CFR §122.41(l)(6)(iii)*].

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted Facility. Notice is required under this provision only when [*40 CFR §122.41(l)(1)*]:

1. The alteration or addition to a permitted Facility may meet one of the criteria for determining whether a Facility is a new source in 40 CFR §122.29(b) [*40 CFR §122.41(l)(1)(i)*]; or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in this Order nor to notification requirements under 40 CFR Part 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1) [*40 CFR §122.41(l)(1)(ii)*].

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan [*40 CFR §122.41(l)(1)(iii)*].

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or SWRCB of any planned changes in the permitted Facility or activity that may result in noncompliance with General Order requirements [*40 CFR §122.41(l)(2)]*.

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting E.3, E.4, and E.5 at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E [*40 CFR §122.41(l)(7)*].

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, SWRCB, or USEPA, the Discharger shall promptly submit such facts or information [*40 CFR §122.41(l)(8)*].

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, Sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe [*40 CFR §122.42(a)*]:

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" [*40 CFR §122.42(a)(1)*]:

    a. 100 micrograms per liter (µg/L) [*40 CFR §122.42(a)(1)(i)*];

    b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony [*40 CFR §122.42(a)(1)(ii)*];

    c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [*40 CFR §122.42(a)(1)(iii)*]; or

    d. The level established by the Regional Water Board in accordance with 40 CFR §122.44(f) [*40 CFR §122.42(a)(1)(iv)*].

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels" [*40 CFR §122.42(a)(2)*]:

    a. 500 micrograms per liter (µg/L) [*40 CFR §122.42(a)(2)(i)*];

    b. 1 milligram per liter (mg/L) for antimony [*40 CFR §122.42(a)(2)(ii)*];

    c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [*40 CFR §122.42(a)(2)(iii)*]; or

    d. The level established by the Regional Water Board in accordance with 40 CFR §122.44(f) [*40 CFR §122.42(a)(2)(iv)*].

B. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following [*40 CFR §122.42(b)*]:

1. Any new introduction of pollutants into the POTW from an indirect Discharger that would be subject to Sections 301 or 306 of the CWA if it were directly discharging those pollutants [*40 CFR §122.42(b)(1)*]; and

2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order [*40 CFR §122.42(b)(2)*].

3. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW [*40 CFR §122.42(b)(3)*].

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (CFR) at 40 CFR §122.48 requires that all NPDES permits specify monitoring and reporting requirements. CWC Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the Federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of this Regional Water Board.

B. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:

1. "A Guide to Methods and Standards for the Measurement of Water Flow," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 96 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD Catalog No. C13.10:421.)

2. "Water Measurement Manual," U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D.C. 20402. Order by Catalog No. 172.19/2:W29/2, Stock No. S/N 24003-0027.)

3. "Flow Measurement in Open Channels and Closed Conduits," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Services (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

4. "NPDES Compliance Sampling Manual," U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-51, 1977, 140 pp. (Available from the General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, CO 80225.)

C. Unless otherwise approved by the Regional Water Board's Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", promulgated by the United States Environmental Protection Agency (USEPA).

D. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

F. If the Facility is not in operation, or there is no discharge during a required reporting period, the Discharger shall forward a letter to the Regional Water Board indicating that there has been no activity during the required reporting period.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1 Monitoring Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	INF-001	At the influent flow meter, previous to the influent pumping station.
001	EFF-001	At the point of discharge where representative samples of effluent can be obtained. Samples shall be taken immediately after all treatment and disinfection units and previous to the discharge to the receiving water.
--	R-001	At the first manhole upstream from the point of discharge, approximately 150 feet upstream from the point of discharge, and not to exceed 200 feet upstream from the point of discharge.
--	R-002	At the first manhole downstream from the point of discharge, approximately 300 feet downstream of the point of discharge, and prior to any other influents into the receiving water.
	S-001	Sludge removed for disposal

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

1. The Discharger shall monitor influent to the Facility at INF-001 as follows:

Table E-2 Influent Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Reporting Level, units), respectively
BOD 5-day 20°C	mg/L	24-Hr. Composite	1x/Week	See Footnote [1]
Total Suspended Solids	mg/L	24-Hr. Composite	1x/Week	See Footnote [1]

[1] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor secondary treated wastewater at EFF-001 as follows. If more than one analytical test method is listed for a given parameter, the Discharger may select from the listed methods and associated Reporting Level:

Table E-3 Effluent Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Reporting Level, units), respectively
Chlorine, Total Residual	mg/L	Continuous	Continuous[2]	See Footnote [3]
Daily Effluent Discharge	MGD	Flow Meter Reading	Continuous	See Footnote [4]
pH	pH Units	Grab	1x/Day	See Footnote [3]
Escherichia Coli (E. Coli)	Number/ 100 ml	Grab	2x/Week	See Footnote 5
BOD 5-day 20°C	mg/L	24-Hr. Composite	1x/Week	See Footnote [3]
Temperature	°F	Grab	1x/Week	See Footnote [3]
Total Suspended Solids	mg/L	24-Hr. Composite	1x/Week	See Footnote [3]
Ammonia Nitrogen, Total (as N)	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Copper, Total Recoverable	µg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Free Cyanide	µg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Lead, Total Recoverable	µg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Nitrates as Nitrogen (as N)	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Nitrites as Nitrogen (as N)	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Nitrogen, Total (as N)	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Orthophosphate (as P)	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Phosphate, Total (as P)	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Total Dissolved Solids	mg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Zinc, Total Recoverable	µg/L	24-Hr. Composite	1x/Month	See Footnote [3]
Oil and Grease	mg/L	Grab	1x/Year	See Footnote [3]
Priority Pollutants[6]	µg/L	Grab	1x/Year	See Footnote [3]

[2] Until such time when continuous monitoring for total residual chlorine is commenced, compliance with effluent limitations for total residual chlorine will be determined using grab samples collected throughout the operators' work period. Samples shall be collected within the first and last hours of the operators' work period, and at least every 4 hours in between. The Discharger shall provide all monitoring data for total residual chlorine and report the maximum daily concentration with each monthly SMR.

[3] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.

[4] Report Daily Flow.

[5] The Discharger may monitor E. coli using analytical methods, Standard Method 9221.F or 9223, (APHA.1998, 1995, 1992. Standard Methods for Examination of Water and Wastewater. American Public Health Association, 20th, 19th and 18 editions. Amer. Publ. Hlth. Assoc., Washington, D.C.).

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Monitoring Requirements

1. Bioassays shall be performed to evaluate the toxicity of the discharged wastewater in accordance with the following procedures unless otherwise specified by the Regional Water Board's Executive Officer or his designee:

   a. Bioassays shall be conducted on a sensitive fish species and an invertebrate species as approved by the Regional Water Board's Executive Officer. *Pimephales promelas* (fathead minnow) and *Ceriodaphnia dubia* (water flea) are suggested test species that may be utilized. The bioassays shall be conducted in accordance with the protocol given in EPA/821-R-02-013 – Short Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, 4th Edition, and EPA/821-R-02-012 – Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters for Freshwater and Marine Organisms, 5th Edition, or subsequent editions.

2. The Discharger shall conduct chronic and acute toxicity testing on the final effluent discharged to Central Drain 3-D No. 1 *(Imperial Valley Drain)* at monitoring point EFF-001 as follows:

Table E-4 Whole Effluent Toxicity Testing

Test	Units	Sample Type	Minimum Sampling Frequency
Chronic Toxicity	TUc [7]	24-hr Composite	Quarterly
Acute Toxicity	TUa [8,9]	24-hr. composite	Quarterly

3. Both test species given below shall be used to measure chronic and acute toxicity:

Table E-5 Approved Test for Acute and Chronic Toxicity

Species	Effect	Test Duration (days)	Reference
Fathead Minnow (*Pimephales promelas*)	Larval Survival and Growth	7	EPA/821-R-02-013 (Chronic) EPA/821-R-02-012 10(Acute)
Water Flea (*Ceriodaphnia dubia*)	Survival and Reproduction	7	EPA/821-R-02-013 (Chronic) EPA/821-R-02-012 (Acute)

[6] Priority Pollutants as defined by the California Toxics Rule (CTR) defined in Finding II.I of the Limitations and Discharge Requirements of this Order, and included as Attachment G.
[7] TUc = Chronic Toxicity Units
[8] TUa = Acute Toxicity Units, Acute Bioassay results can be calculated from chronic bioassay test for Pimephales promelas
[9] Discharger can provide Pass/Fail when using a t-test

4. Toxicity Test References for Conducting Toxicity Tests

   a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA/821-R-02-012, October 2002 or subsequent editions.

   b. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water for Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002 or subsequent editions.

B. Quality Assurance

1. Dilution and control waters may be obtained from an unaffected area of receiving waters. Synthetic (standard) dilution is an option and may be used if the above source is suspected to have toxicity greater than 1.0 TU_c

2. A series of at least five dilutions and a control shall be tested for chronic toxicity testing and may be used for acute toxicity testing. The series shall include the following concentrations: 12.5, 25, 50, 75, and 100 percent effluent.

3. For the acute toxicity testing using a t-test, two dilutions shall be used, i.e., 100 percent effluent and a control (when a t-test is used instead of an LC50).

4. If organisms are not cultured in-house, concurrent testing with a referenced toxicant shall be conducted. Where organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests also shall be conducted using the same test conditions as the effluent toxicity tests (e.g., same test duration, etc.).

5. If either the reference toxicant test or effluent test does not meet all test acceptability criteria (TAC) as specified in the toxicity test references, then the permittee must re-sample and retest within 15 working days or as soon as possible. The retesting period begins when the Discharger collects the first sample required to complete the retest.

6. The reference toxicant and effluent tests must meet the upper and lower bounds on test sensitivity as determined by calculating the percent minimum significant difference (PMSD) for each test result. The test sensitivity bound is specified for each test method in the respective methods manuals.

C. Accelerated Monitoring Requirements

When the numeric toxicity trigger is exceeded during regular toxicity monitoring, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring to confirm the effluent toxicity.

The Discharger shall implement an accelerated monitoring frequency consisting of performing three (3) toxicity tests in a nine (9)-week period beginning from the date the Discharger receives an initial exceedance of the chronic or acute toxicity triggers described below:

Any chronic toxicity test that exceeds 2 chronic toxicity units (TU_c) or a three (3)-sample median[10] (consecutive samples) that exceeds 1 TU_c shall trigger an accelerated monitoring frequency. In addition, any acute toxicity test results showing high toxicity shall trigger an accelerated monitoring frequency. High acute toxicity is defined as follows:

[10] 3-Sample median is defined as follows: The Middle value of three (3) consecutive samples arranged from the low value to the high value.

a. Less than 80% survival when acute toxicity is calculated from results of the chronic toxicity test (only for *Pimephales promelas*), or

b. Less than 90% survival when acute toxicity is calculated from the results of the acute toxicity test, or

c. Results of acute toxicity t-test for 100 percent effluent concentration that is reported as failed.

The scope of accelerated monitoring shall be limited to the species and analytical method that failed the test.

The numeric toxicity triggers are not an effluent limitation, they are the toxicity threshold at which the Discharger is required to perform accelerated monitoring to confirm effluent toxicity, as well as, the threshold to initiate a TRE if toxicity is confirmed.

If implementation of the generic (Toxicity Reduction Evaluation (TRE) work plan indicates the source of the exceedance of the toxicity trigger (for instance, a temporary plant upset), then only one additional test is necessary. If exceedance of the toxicity trigger is detected in this test, the Discharger will continue with accelerated monitoring requirements or implement the Toxicity Identification and Toxicity Reduction Evaluations.

If none of the three tests indicated exceedance of the toxicity trigger, then the Discharger may return to the normal bioassay testing frequency.

D. Conducting Toxicity Identification Evaluations and Toxicity Reduction Evaluations

1. A Toxicity Identification Evaluation (TIE) shall be triggered if testing from the accelerated monitoring frequency indicates any of the following:

   a. Two of the three accelerated chronic toxicity tests are reported as failed tests meeting any of the conditions specified in Attachment E, Section V.C; or

   b. Two of the three acute toxicity tests are reported as failed tests meeting any of the conditions specified in Attachment E, Section V.C.

   c. The TIE shall be initiated within 15 days following failure of the second accelerated monitoring test.

   d. If a TIE is triggered prior to the completion of the accelerated testing, the accelerated testing schedule may be terminated, or used as necessary in performing the TIE.

2. The TIE shall be conducted to identify and evaluate toxicity in accordance with procedures recommended by the United States Environmental Protection Agency (USEPA) which include the following:

   a. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I, (USEPA, 1992a);

   b. Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition (USEPA, 1991a);

   c. Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Sampling Exhibiting Acute and Chronic Toxicity (USEPA, 1993a); and

d. Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity (USEPA, 1993b).

3. As part of the TIE investigation, the Discharger shall be required to implement its TRE work plan. The Discharger shall take all reasonable steps to control toxicity once the source of the toxicity is identified. A failure to conduct required toxicity tests or a TRE within a designated period shall result in the establishment of numerical effluent limitations for chronic toxicity in a permit or appropriate enforcement action. Recommended guidance in conducting a TRE include the following:

   a. Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, August 1999, EPA/833B-99/002; and

   b. Clarifications Regarding Toxicity Reduction and Identification Evaluations in the National Pollutant Discharge Elimination System Program dated March 27, 2001, USEPA Office of Wastewater Management, Office of Regulatory Enforcement.

E. Definition of Toxicity

1. Chronic toxicity measures sub-lethal effect (e.g., reduced growth, reproduction) to experimental test organisms exposed to an effluent or ambient waters compared to that of the control organisms.

2. Chronic toxicity shall be measured in TU_c, where $TU_c = 100/NOEC$. The no observed effect concentration (NOEC) is the highest concentration of toxicant to which organisms are exposed in a chronic test that causes no observable adverse effect on the test organisms (e.g., the highest concentration of toxicant to which the values for the observed responses are not statistically significantly different from the controls).

3. Acute toxicity is a measure of primarily lethal effects that occur over a ninety-six (96) hour period. Acute toxicity for *Pimephales promelas* can be calculated from the results of the chronic toxicity test for *Pimephales promelas* and reported along with the results of each chronic test. Acute toxicity for *Ceriodaphnia dubia* cannot be calculated from the results of the chronic toxicity test for *Ceriodaphnia dubia* because the test design is not amenable to calculation of a lethal concentration (LC50) value as needed for the acute requirement.

4. Acute toxicity shall be measured in Tu_a, where $Tu_a = 100/LC50$ or as pass/fail using a t-test. LC50 is the toxicant concentration that would cause death in 50 percent of the test organisms.

F. Reporting

1. The Discharger shall submit the analysis and results of the toxicity test, including any accelerated testing in toxicity units with the discharge monitoring reports for the month in which the last test is conducted.

2. If a TIE is conducted the Discharger shall submit the results of the TIE with the discharge monitoring reports for the month in which the final report is completed.

3. If the TRE Workplan has been initiated, the Discharger shall report on the progress of the actions being taken and include this information with each monthly monitoring report.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECLAMATION MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. Monitoring Location R-001

1. The Discharger shall monitor Central Drain 3-D No. 1 at R-001 as follows. In the event that no receiving water is present at station R-001, no receiving water monitoring data is required for station R-001:

Table E-6 Receiving Water Monitoring Requirements for Monitoring Location R-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Reporting Level, units), respectively
pH	s.u.	Grab	1x/Month	See Footnote [11]
Priority Pollutants[12]	µg/L	Grab	1x/Year	See Footnote [11]
Ammonia Nitrogen, Total (as N)	mg/L	Grab	1x/Month	See Footnote [11]
Dissolved Oxygen	mg/L	Grab	1x/Month	See Footnote [11]
Hardness (CaCO3)	mg/L	Grab	1x/Month	See Footnote [11]
Nitrates as Nitrogen (N)	mg/L	Grab	1x/Month	See Footnote [11]
Nitrites as Nitrogen (N)	mg/L	Grab	1x/Month	See Footnote [11]
Nitrogen, Total (as N)	mg/L	Grab	1x/Month	See Footnote [11]
Orthophosphate (as P)	mg/L	Grab	1x/Month	See Footnote [11]
Phosphate, Total (as P)	mg/L	Grab	1x/Month	See Footnote [11]
Temperature	°F	Grab	1x/Month	See Footnote [11]
Total Dissolved Solids	mg/L	Grab	1x/Month	See Footnote [11]

B. Monitoring Location R-002

1. The Discharger shall monitor Central Drain 3-D No. 1 at R-002 as follows. In the event that no receiving water is present at station R-001, no receiving water monitoring data is required for station R-002:

Table E-7 Receiving Water Monitoring Requirements for Monitoring Location R-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Reporting Level, units), respectively
pH	s.u.	Grab	1x/Month	See Footnote [13]
Ammonia Nitrogen, Total (as N)	mg/L	Grab	1x/Month	See Footnote [13]
Dissolved Oxygen	mg/L	Grab	1x/Month	See Footnote [13]

[11] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.

[12] Priority Pollutants as defined by the California Toxics Rule (CTR) defined in Finding II.I of the Limitations and Discharge Requirements of this Order, and included as Attachment G.

[13] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Reporting Level, units), respectively
Hardness (CaCO3)	mg/L	Grab	1x/Month	See Footnote [13]
Nitrates as Nitrogen (N)	mg/L	Grab	1x/Month	See Footnote [13]
Nitrites as Nitrogen (N)	mg/L	Grab	1x/Month	See Footnote [13]
Nitrogen, Total (as N)	mg/L	Grab	1x/Month	See Footnote [13]
Orthophosphate (as P)	mg/L	Grab	1x/Month	See Footnote [13]
Phosphate, Total (as P)	mg/L	Grab	1x/Month	See Footnote [13]
Temperature	°F	Grab	1x/Month	See Footnote [13]
Total Dissolved Solids	mg/L	Grab	1x/Month	See Footnote [13]

C. Visual Monitoring Upstream and Downstream Receiving Water Sampling Points

1. In conducting the receiving water sampling, a log shall be kept of the receiving water conditions at Stations R-001 and R-002. In the event that no receiving water is present at station R-001, no receiving water monitoring data is required for station R-001. Notes on receiving water conditions shall be summarized in the monitoring report. Attention shall be given to the presence or absence of:

   a. Floating or suspended matter;

   b. Discoloration;

   c. Aquatic life (including plants, fish, shellfish, birds);

   d. Visible film, sheen or coating;

   e. Fungi, slime, or objectionable growths; and

   f. Potential nuisance conditions.

D. Monitoring Location Groundwater – Not Applicable

IX. OTHER MONITORING REQUIREMENTS

A. Water Supply Monitoring

The Discharger is required to obtain or acquire quarterly total dissolved solids concentrations of the source water, either through monitoring or obtaining the data from the drinking water purveyor. This information will be compiled and summarized in an annual report.

B. Monitoring Location S-001 Sludge Monitoring

1. Sludge that is generated at the treatment Facility shall be sampled and analyzed for the following prior to disposal:

Table E-8 Sludge Monitoring for Monitoring Location S-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Reporting Level, units), respectively
Arsenic	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Cadmium	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Copper	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Lead	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Mercury	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Molybdenum	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Nickel	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Selenium	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Zinc	mg/kg	Grab[14]	1x/Year	See Footnote [15]
Fecal Coliform	MPN/g	Grab[14]	1x/Year	See Footnote [15]

2. The Discharger shall report annually on the quantity, location and method of disposal of all sludge and similar solid materials being produced at the wastewater treatment plant Facility.

C. Pretreatment Monitoring - Not applicable

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) relating to monitoring, reporting and recordkeeping.

2. The Discharger shall report the results of acute and chronic toxicity testing, TRE and TIE as required in the previous Section entitled, "Effluent Toxicity Testing".

3. The results of any analysis taken, more frequently than required using analytical methods, monitoring procedures and performed at the locations specified in this Monitoring and Reporting Program shall be reported to the Regional Water Board.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs in accordance with the requirements described in subsection B.5 below. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under Sections III through IX and X.D. Additionally, the Discharger shall report in the SMR the results of any special studies, TRE/TIE, PMP, and Pollution Prevention Plan required by Limitations and Discharge Requirements, Special Provisions, Section VI.C. of this Order. The Discharger shall

[14] A composite sample of sludge shall be collected when sludge is removed from the ponds for disposal in accordance with USEPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989.
[15] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 503.

submit monthly, quarterly, and annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-9 Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	June 21, 2006	All	Submit with SMR
1x/Day	June 21, 2006	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with SMR
1x/Week	June 25, 2006	Sunday through Saturday	Submit with SMR
1x/Month	July 1, 2006	1st day of calendar month through last day of calendar month	31 days from the end of the monitoring period
1x/Quarter	July 1, 2006	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	31 days from the end of the monitoring period
1x/Year	January 1, 2006	January 1 through December 31	31 days from the end of the monitoring period
1x/5Years	No sooner than 4 years and no less than 4 years, 6 months from permit effective date	January 1 through December 31	31 days from the end of the monitoring period

4. Reporting Protocols. The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

   The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

   a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit hard copy SMRs (with an original signature) when required by Section X.B.1 above in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the Facility is operating in compliance with interim and/or final effluent limitations.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Submit monitoring reports to:
California Regional Water Quality Control Board Colorado River Basin Region 73-720 Fred Waring, Suite 100 Palm Desert, CA 92260

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this Permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy Federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below:

Submit monitoring reports to:
State Water Resources Control Board Discharge Monitoring Report Processing Center Post Office Box 671 Sacramento, CA 95812

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

D. Other Reports

1. Operations and Maintenance Report

The Discharger shall report the following:

Table E-10 Operations and Maintenance Report

Activity	Reporting Frequency
To inspect and document any operation/maintenance problems by inspecting each unit process. In addition, calibration of flow meters and mechanical equipment shall be performed in a timely manner and documented.	1x/Year
The amount of chemical used (i.e., chlorine, etc.,) shall be monitored daily and reported monthly. Measured in pounds per day.	1x/Month

ATTACHMENT F – FACT SHEET

TABLE OF CONTENTS

LIST OF TABLES

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1 Facility Information

WDID	7A130104011
Discharger	Heber Public Utilities District
Name of Facility	Wastewater Treatment Plant, Heber
Facility Address	1184 Rockwood Avenue
	Heber, CA 92249
	Imperial County
Facility Contact, Title and Phone	John A Jordan, General Manager, 760-482-2440
Authorized Person to Sign and Submit Reports	John A Jordan, General Manager, 760-482-2440
Mailing Address	P.O. Box H, Heber, CA 92249-0470
Billing Address	Same as Mailing Address
Type of Facility	POTW
Major or Minor Facility	Minor
Threat to Water Quality	2
Complexity	B
Pretreatment Program	N
Reclamation Requirements	none
Facility Permitted Flow	0.810 MGD
Facility Design Flow	0.810 MGD
Watershed	Imperial Hydrologic Unit (Brawley HA) – 723.10
Receiving Water	Central Drain 3-D No. 1 *(Imperial Valley Drain)*
Receiving Water Type	Surface Water

A. Heber Public Utility District (hereinafter Discharger) is the owner and operator of Heber Municipal Wastewater Treatment Plant (hereinafter Facility) a POTW**.**

B. The Facility discharges wastewater to Central Drain 3-D No. 1 *(Imperial Valley Drain),* a water of the United States and is currently regulated by Order 00-100 which was adopted on September 13, 2000 and expired on September 13, 2005. The terms of the existing Order are automatically continued in effect after the permit expiration date.

C. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on June 17, 2005. Supplemental Information was requested on July 20, 2005 and October 26, 2005 and was received on September 16, 2005 and March 1, 2006, respectively. A site visit was conducted on December 8, 2005 to observe operations and collect additional data to develop permit limitations and conditions.

II. FACILITY DESCRIPTION

A. Description of Wastewater and Biosolids Treatment or Controls

1. The Heber Public Utilities District owns the wastewater collection, treatment and disposal system (hereinafter referred to as Facility) and provides sewerage service to the City of Heber, California and the surrounding area, which totals approximately 4,000 people and no known industrial users. During the course of Order No. 00-100, a treatment plant expansion was completed. This expansion, completed on July 23, 2001, increased the design capacity flow from 0.405 MGD to 0.810 MGD and is located in the NW ¼, NE ¼ of Section 28, T16S, R14E, SBB&M.

2. The treatment system consists of a headworks, which includes two in-channel comminutors and an ultra sonic flow meter, an influent pump station, which includes four non-clog centrifugal pumps, two oxidation ditches (design capacity of 0.405 MGD each), flow splitter boxes after each oxidation ditch, which split influent flow between four secondary clarifiers, two pump stations, which direct sludge to the sludge drying beds, and a chlorine contact basin consisting of a chlorine disinfection system and a dechlorination system. Wastewater is discharged from Discharge Point 001 (see Table 2 on cover) to the Central Drain 3-D No. 1, a water of the United States.

3. The Discharger stockpiles sludge on-site to dry it to at least 90 percent solids. Dried sludge from the Facility is hauled to an off-site landfill for disposal.

4. The Discharger expects to be at 80 percent of the current treatment plant's flow capacity by December of 2006. In February 2006 the Discharger approved the start of a study of the wastewater plant expansion or new treatment process. The Discharger plans to complete the plant expansion during the term of this Order by June 2008.

B. Discharge Points and Receiving Waters

1. The final effluent is discharged to the Central Drain 3-D No. 1 *(Imperial Valley Drain)*, tributary to the Alamo River within the Imperial Hydrologic Unit. The permitted maximum daily flow limitation is equal to the design capacity of the wastewater treatment plant, which is 0.810 MGD.

2. The discharge consists of secondary treated domestic wastewater.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

1. Effluent limitations contained in the existing Order for discharges from Discharge Point 001 (Monitoring Location EFF-001) and representative monitoring data from the term of the previous Order are as follows:

Table F-2 Historic Effluent Limitations and Monitoring Data

Parameter (units)	Effluent Limitation			Monitoring Data (From September 2001 – To October 2005)		
	Ave Monthly	Ave Weekly	Max Daily	Maximum Ave Monthly	Maximum Ave Weekly	Maximum Daily
Daily Effluent Discharge (MGD)	-	-	0.405[1] 0.810[2]	-	-	0.626 0.740
pH (s.u.)	-	-	6.0 – 9.0	-	-	6.1 – 8.4[3]
Chlorine Residual (mg/L)	0.01	-	0.02 (inst.)	0.004	-	0.02
20°C BOD_5 (mg/L)	30	45	-	10.3	23	-
Total Suspended Solids (mg/L)	30	45	-	23.2	79	-
E. Coli (MPN/100mL)	126	-	400	78.9	-	>1600
20°C BOD_5 (% Removal)	85	-	-	94.1[4]	-	-
Total Suspended Solids (% Removal)	85	-	-	91	-	-
Acute Toxicity (% Survival)	-	-	-	90[5]	-	-

[1] Daily maximum limitation until plant expansion completion on July 23, 2001.
[2] Daily maximum limitation after plant expansion.
[3] This represents the range of reported pH values.
[4] This value represents the lowest reported value of the minimum percent removal of the pollutant.
[5] Recorded for *Ceriodaphnia dubia*. Further, 90 percent survival occurred twice during the term of the previous Order (June 2001 and August 2003).

2. The Report of Waste Discharge described the existing discharge as follows:

   Annual Average Effluent Flow – 0.325 MGD
   Maximum Daily Effluent Flow – 0.626 MGD
   Average Daily Effluent Flow – 0.325 MGD

3. The Report of Waste Discharge described the effluent characteristics as follows:

Table F-3 ROWD Effluent Characteristics

Parameter (units)	Maximum Daily	Average Daily
pH Lowest Maximum Daily (pH Units)	6.9	--
pH Highest Maximum Daily (pH Units)	8.0	--
Temperature (Winter) Maximum Daily (°F)	63	61
Temperature (Summer) Maximum Daily °F	88	83
BOD_5 Average Daily (mg/L)	--	4.04
Total Suspended Solids (mg/L)	79	7.04
Fecal Coliform Maximum Daily(MPN/100 mL)	>1600	--
Ammonia as Nitrogen (mg/L)	1.68	0.12
Total Residual Chlorine (mg/L)	0.0	0.0
Dissolved Oxygen (mg/L)	11.5	10.96
Total Kjeldahl Nitrogen (mg/L)	2.24	2.24
Nitrate plus Nitrite as Nitrogen (mg/L)	20.8	18.48
Oil and Grease (mg/L)	<10	<10
Phosphorus (mg/L)	3.2	2.82
Total Dissolved Solids (mg/L)	944	917.33

D. Compliance Summary

The most common effluent violation was daily maximum effluent flow as there were over 80 recorded violations. All of these violations occurred previous to the plant expansion; which was completed on July 23, 2001. Other effluent violations included E. Coli (>1600 MPN/100mL, October 2005), acute toxicity (90% survival, August 2003 and June 2001), and total suspended solids (79 mg/L, February 2001). Reporting violations included a mistake in transcription of total suspended solids from the laboratory information to the SMRs, noting an incorrect sample date on the summary page provided by the Discharger from the laboratory analytical data sheet for orthophosphate and total phosphate, and a late submittal of the July 2001 monthly status report regarding the plant expansion. Enforcement actions taken by the Regional Water Board over the course of the previous Permit relate to the Facility expansion. Time Schedule Order No. 01-157 was issued, in place of Time Schedule Order No. 01-154, to ensure the timely completion of the plant expansion.

Compliance issues noted during the site visit, conducted on December 8, 2005, include dilution of the effluent from the influent of dewatering groundwater from an onsite construction project, high sedimentation in the disinfection system as a result of this construction, and operational and maintenance problems in the secondary clarifiers. Representative effluent samples were not being obtained, nor was a representative flow measurement being recorded or reported to the Regional Water Board as influent flow readings were being reported as effluent flow to the Regional Water Board. Sludge had recently discharged to land not controlled or owned by the Discharger.

E. Planned Changes

The Discharger completed a plant expansion in accordance with Time Schedule Order No. 01-157. This expansion increased the design capacity of the treatment plant from 0.405 MGD to 0.810 MGD. The plant expansion added a new headworks, consisting of two in-channel comminutors and influent flow meter, a new influent pump station, one additional oxidation ditch, two new secondary clarifiers, a chlorine disinfection system, and a dechlorination chamber. The scheduled completion date for the expansion was May 31, 2001; the actual completion date was July 23, 2001.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this Section.

A. Legal Authorities

This Order is issued pursuant to Section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as a NPDES permit for point source discharges from this Facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC for discharges that are not subject to regulation under CWA Section 402.

B. California Environmental Quality Act (CEQA)

This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with Section 13389 of the CWC.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Regional Water Board adopted a Water Quality Control Plan for the Colorado River Basin Region (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan (includes amendments adopted by the Regional Water Board through October 2005).

   The Basin Plan does not specifically identify beneficial uses for the Central Drain 3-D No. 1; however, identifies beneficial uses for the Imperial Valley Drains. The beneficial uses of the Imperial Valley Drains are listed below in Table F-4, and are applicable to the Central Drain 3-D No. 1.

Table F-4 Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Central Drain 3-D No. 1 *(Imperial Valley Drain)*	Existing: Fresh Water Replenishment of the Salton Sea (FRSH); Water Contact Recreation (REC 1)[1,2]; Non-Contact Water Recreation (REC II)[1]; Warm Water Habitat (WARM); Wildlife Habitat (WILD); Preservation of Rare, Threatened or Endangered Species[3]

[1] Unauthorized Use.
[2] The only REC 1 usage that is known to occur is from infrequent fishing.
[3] Rare, endangered, or threatened wildlife exist in or utilizes some of this water way(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon the California Department of Fish and Game on its own initiative and/or at the request of the Regional Water Board; and such substantiation must be provided within a reasonable time frame as approved by the Regional Water Board.

2. **Thermal Plan.** The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. The Thermal Plan does not apply to the Central Drain 3-D No. 1.

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

4. **State Implementation Policy.** On March 2, 2000, State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP*).* The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Boards in their basin plans, with the exception of the provision on alternate test procedures for individual discharges that have been approved by USEPA Regional Administrator. The alternate test procedures provision was effective on May 22, 2000. The SIP became effective on May 18, 2000. The SIP includes procedures for determining the need for and calculating water quality-based effluent limitations (WQBELs), and requires Dischargers to submit data sufficient to do so.

5. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for CWA purposes (40 CFR §131.21, 65 FR 24641, April 27, 2000). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

6. **Stringency of Requirements for Individual Pollutants.** This Order contains restrictions on individual pollutants that are no more stringent than required by the Federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The technology-based effluent limitations consist of restrictions on biological oxygen demand (BOD) and total suspended solids (TSS). Restrictions on BOD and TSS are specified in Federal regulations as discussed in 40 CFR Part 125 and the Permit's technology-based pollutant restrictions are no more stringent than required by the CWA. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to Federal law and are the applicable Federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR §131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on May 18, 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR §131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

7. **Antidegradation Policy.** Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the Federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, which incorporates the requirements of the Federal antidegradation policy. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. As discussed in detail in this Fact Sheet, the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

8. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and 40 CFR §122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. All effluent limitations in the Order are at least as stringent as the effluent limitations in the previous Order.

9. **Monitoring and Reporting Requirements.** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement Federal and State requirements. This MRP is provided in Attachment E.

10. **Storm Water Requirements**.

    a. Federal regulations for storm water discharges require specific categories of facilities which discharge storm water associated with industrial activity (storm water) to obtain NPDES permits and to implement Best Conventional Pollutant Technology (BCT) and Best Available Technology Economically Achievable (BAT) to reduce or eliminate industrial storm water pollution.

    b. The State Water Board adopted Order No. 97-03-DWQ (General Permit No. CAS000001), specifying waste discharge requirements for discharges of storm water associated with industrial activities, excluding construction activities, and requiring submittal of a Notice of Intent by industries to be covered under the Permit. Coverage under the General Permit is not required because all storm water that falls onsite evaporates onsite or is routed into the treatment systems.

D. Impaired Water Bodies on CWA 303(d) List

The immediate receiving water is the Central Drain 3-D No. 1, which is a part of the Imperial Valley Drains. The 2002 USEPA 303(d) list of impaired waters (hereinafter 303(d) List) classifies the Imperial Valley Drains as impaired by sediment/silt, pesticides, and selenium. Further, the Alamo River, to which the Central Drain 3-D No. 1 is tributary, is listed as impaired by pesticides and selenium. There is an approved Total Maximum Daily Load (TMDL) for sedimentation/siltation for the Alamo River. The sediment TMDL has established a Waste Load Allocation (WLA) for sediment of twice the current Total Suspended Solids (TSS) loading rate. In addition, the 303(d) List classifies the Salton Sea as impaired by nutrients. Tributaries to the Salton Sea, including the Alamo River, may be affected by the future TMDLs. No TMDL has been developed to date, although a nutrient TMDL is under development for the Salton Sea that may have adverse impacts on permitted discharges to tributaries to the Salton Sea (Alamo River). This TMDL is tentatively scheduled for completion in 2009.

E. Other Plans, Polices and Regulations – Not Applicable

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations; and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where numeric water quality objectives have not been established. Three options exist to protect water quality: 1) 40 CFR §122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA Section 304(a); 2) proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information may be used; or 3) an indicator parameter may be established.

Effluent and receiving water limitations in this Order are based on the Federal CWA, Basin Plan, State Water Board's plans and policies, USEPA guidance and regulations, and best practicable waste treatment technology. While developing effluent limitations and receiving water limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

1. EPA NPDES Application Forms 1 and 2A dated June 17, 2005 (supplemental information received September 2005 and March 1, 2006).

2. State Water Board Form 200 dated June 17, 2005.

3. Code of Federal Regulations – Title 40

3. Water Quality Control Plan (Colorado River Basin – Region 7) as amended to date.

4. Regional Water Board files related to Heber Public Utilities District, Municipal Wastewater Treatment Plant NPDES Permit No. CA0104370.

5. Data collected during the Facility site visit on December 8, 2005.

A. Discharge Prohibitions

Discharge Prohibitions included in this Draft Order are carried over from the Prohibitions and Specifications (Sections C and D) of the previous Order (Order No. 00-100). Bioassay Specifications of the previous Order are included in Section V. of the Monitoring and Reporting Program (Attachment E) of this Order. Specification D.2., regarding the protection of the Facility from washout or erosion of wastes as a result of floods having predicted frequency of once in 100 years, is included in subsection VI.A.2.a. of this Order.

B. Technology-Based Effluent Limitations

1. Scope and Authority

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

1) Best practicable treatment control technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. BPT standards apply to toxic, conventional, and nonconventional pollutants.

2) Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and nonconventional pollutants.

3) Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the "cost reasonableness" of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

4) New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 CFR §125.3 of the NPDES regulations authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the permit writer must consider specific factors outlined in 40 CFR §125.3.

a. Secondary Treatment Standards. Regulations promulgated in 40 CFR §125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in Section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in 40 CFR Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

a. This Facility meets the technology-based regulations for the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD_5) and total suspended solids (TSS).

b. These effluent limitations have been carried over from previous Order No. 00-100. Further, mass-based effluent limitations are based on a design flow rate of 0.810 MGD.

Summary of Technology-based Effluent Limitations
Discharge Point 001

Table F-5 Summary of Technology-based Regulations (Fact Sheet)

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	MGD	0.810	---	---	---	---
Biochemical Oxygen Demand (BOD) 5-day @ 20°C	mg/L	30	45	---	---	---
	lbs/day[4]	200	300	---	---	---
Total Suspended Solids (TSS)	mg/L	30	45	---	---	---
	lbs/day	200	300	---	---	---
Removal Efficiency for BOD and TSS	%	85	---	---	---	---

c. **Basis for Limitations**

Limitations included in this Order for flow, biological oxygen demand, and total suspended solids are carried over from the previous Order No. 00-100. The bases for these limitations are described in Table F-6 below.

Table F-6 Basis of Limitations (Fact Sheet)

Parameters	Basis for Limitations
Flow	The design capacity of the treatment plant is currently 0.810 MGD.
Biological Oxygen Demand (BOD_5)	The BOD_5 limits and minimum percent removal requirements are equal to the Discharges to waters that support aquatic life and are dependent on oxygen. Organic matter in the discharge may consume oxygen as it breaks down. BOD limits are allowable to minimize the consumption of oxygen by organic matter due to poor Facility performance.
Total Suspended Solids (TSS)	High levels of suspended solids can adversely impact aquatic habitat. Untreated or improperly treated wastewater can contain high amounts of suspended solids.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in 40 CFR Section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or water quality criteria contained in the CTR and NTR.

[4] The mass-based effluent limitations are based on a design capacity of 0.810 MGD.

a. Effluent discharged from this Facility could contain pollutants in sufficient quantities to affect receiving water quality. Pursuant to Section 13263, Article 4, Chapter 4 of the Porter Cologne Water Quality Control Act, the Regional Water Boards are required to issue Waste Discharge Requirements for discharges that could affect the quality of the State's waters. Furthermore, 40 CFR §122.1 requires the issuance of NPDES permits for pollutants discharged from a point source to the waters of the United States.

b. The USEPA 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 State to issue schedules of compliance for new or revised NPDES permit limits based on the Federal criteria when certain conditions are met.

2. Applicable Water Quality Criteria and Objectives

Table F-7 summarizes the applicable water quality criteria/objective for priority pollutants reported in detectable concentrations in the effluent or receiving water. The hardness value used to conduct the Reasonable Potential Analysis was 400 mg/L. The recorded minimum hardness value of the receiving water was 1,224 mg/L. This value was not used in the Reasonable Potential Analysis because toxicity of metals in water that has a hardness value of greater than 400 mg/L is difficult to discern, therefore the Regional Water Board's standard procedure is to default the value of 400 mg/L in those cases. Due to the brackish nature of the receiving water, both fresh and saltwater criteria are applicable. These criteria were used in conducting the Reasonable Potential Analysis for this Order.

Table F-7 Applicable Beneficial Uses and Water Quality Criteria and Objectives

CTR No.	Parameter	Most Stringent Criteria	CTR/NTR Water Quality Criteria				
			Freshwater		Saltwater		Human Health for Consumption of:
			Acute	Chronic	Acute	Chronic	Organisms only
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
5a	Chromium (III)	644.20	5,404.62	644.20			
6	Copper	3.73	51.68	30.5	5.78	3.73	
7	Lead	8.52	476.82	18.58	220.82	8.52	
13	Zinc	85.62	387.83	387.83	95.14	85.62	
14	Free Cyanide	5.2	22.00	5.2			220,000
23	Chlorodibromomethane	34					34
26	Chloroform	No Criteria					
27	Dichlorobromomethane	46					46

3. Determining the Need for WQBELs

In accordance with Section 1.3 of the SIP, the Regional Water Board conducted a reasonable potential analysis (RPA) for each priority pollutant with an applicable criterion or objective to determine if a WQBEL is required in the Order. The Regional Water Board analyzed effluent and receiving water data to determine if a pollutant in a discharge has the reasonable potential to cause or contribute to an excursion above a state 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 NTR, and when applicable, water quality objectives specified in the Basin Plan. To conduct the RPA, the Regional Water Board identified the maximum observed effluent concentration (MEC) and maximum background concentration (B) in the receiving water for each constituent, based on data provided by the Discharger.

Section 1.3 of the SIP provides the procedures for determining reasonable potential to exceed applicable water quality criteria and objectives. The SIP specifies three triggers to complete a RPA:

1) Trigger 1 – If the MEC is greater than or equal to the CTR water quality criteria or applicable objective (C), a limit is needed.

2) Trigger 2 – If background water quality (B) > C and the pollutant is detected in the effluent, a limit is needed.

3) Trigger 3 – If other related information such as CWA 303(d) listing for a pollutant, discharge type, compliance history, etc. indicates that a WQBEL is required.

Sufficient effluent and ambient 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 Regional Water Board to conduct the RPA. Upon review of the data, and if the Regional Water Board 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 for which effluent data were available. This data includes effluent and upstream receiving water samples collected May 16, 2001 and an effluent sample collected March 1, 2006. Data used in the RPA are summarized in Table F-8. Based on the RPA, copper, lead, zinc, and cyanide demonstrated reasonable potential to cause or contribute to an excursion above a water quality standard. The Regional Water Board evaluated monitoring data for beryllium, chromium (III), chlorodibromomethane, and chloroform and determined WQBELs were not required for these pollutants.

Table F-8 Summary of Reasonable Potential Analysis

CTR No	Priority Pollutant	Applicable Water Quality Criteria (C) ug/L	Max Effluent Conc. (MEC) ug/L	Maximum Detected Receiving Water Conc. (B) ug/L	RPA Result - Need Limit?	Reason
5a	Chromium (III)	644.2	19	23	No	MEC and B < C
6	Copper	3.73	21	17	Yes	MEC and B > C
7	Lead	8.52	16	7.0	Yes	MEC > C
13	Zinc	85.62	280	20	Yes	MEC > C

		Applicable Water Quality Criteria	Max Effluent Conc.	Maximum Detected Receiving Water Conc. (B)	RPA Result - Need Limit?	
		(C)	(MEC)	(B)		
14	Free Cyanide	5.2	10	ND	Yes	MEC > C
23	Chlorodibromomethane	34	7.8	ND	No	MEC<C and B is ND
26	Chloroform	No Criteria	13.7	ND	No	No Criteria
27	Dichlorobromomethane	46	3.6	ND	No	MEC<C and B is ND

4. WQBEL Calculations

a. Final WQBELs are determined using the calculation process outlined in Section 1.4 of the California Toxic Rule and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California. A table providing the calculation for all applicable WQBELs for this Order is provided in Attachment H of this Order.

b. WQBELs Calculation Example

Using free cyanide as an example, the following demonstrates how water quality based effluent limits were established for this Order. The process for developing these limits is in accordance with Section 1.4 of the SIP. Attachment H summarizes the development and calculation of all water quality-based effluent limitations for this Order using the process described below.

Step 1: For each constituent requiring an effluent limit, identify the applicable water quality criteria or objective. For each criteria determine the effluent concentration allowance (ECA) using the following steady state equation:

ECA = C + D(C-B) when C>B, and
ECA = C When C<= B,

Where C = The priority pollutant criterion/objective, adjusted if necessary for hardness, pH and translators. In this Order a hardness value of 400 mg/L (as $CaCO_3$) was used for development of hardness-dependant criteria, and a pH of 7.8 was used for pH-dependant criteria.
D = The dilution credit, and
B = The ambient background concentration

For this Order, dilution was not allowed due to the nature of the receiving water and quantity of the effluent; therefore:

ECA = C

For free cyanide, the applicable water quality criteria are:

ECA_{acute}= 22.0 µg/L
$ECA_{chronic}$= 5.2 µg/L
$ECA_{human\ health}$= 220,000 µg/L

Step 2: For each ECA based on aquatic life criterion/objective, determine the long-term average discharge condition (LTA) by multiplying the ECA by a factor (multiplier). The multiplier is a statistically based factor that adjusts the ECA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion/objective. Table 1 of the SIP provides pre-calculated values for the multipliers based on the value of the CV. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 3 of the SIP and will not be repeated here.

$LTA_{acute} = ECA_{acute} \times Multiplier_{acute}$

$LTA_{chronic} = ECA_{chronic} \times Multiplier_{chronic}$

The CV for the data set must be determined before the multipliers can be selected and will vary depending on the number of samples and the standard deviation of a data set. If the data set is less than 10 samples, or at least 80% of the samples in the data set are reported as non-detect, the CV shall be set equal to 0.6.

For free cyanide, the following data was used to develop the acute and chronic LTA using Table 1 of the SIP:

No. of Samples	CV	$Multiplier_{acute}$	$Multiplier_{chronic}$
1	0.6	0.32	0.53

$LTA_{acute} =$ 22.0 µg/L x 0.32 = 7.06 µg/L

$LTA_{chronic} =$ 5.2 µg/L x 0.53 = 2.74 µg/L

Step 3: Select the most limiting (lowest) of the LTA.

LTA = most limiting of LTA_{acute} or $LTA_{chronic}$

For cyanide, the most limiting LTA was the $LTA_{chronic}$

LTA = 2.74 µg/L

Step 4: Calculate the WQBELs by multiplying the LTA by a factor (multiplier). WQBELs are expressed as Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitation (MDEL). The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations. The value of the multiplier varies depending on the probability basis, the coefficient of variation (CV) of the data set, the number of samples (for AMEL) and whether it is monthly or daily limit. Table 2 of the SIP provides pre-calculated values for the multipliers based on the value of the CV and the number of samples. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 5 of the SIP and will not be repeated here.

$AMEL_{aquatic\ life} = LTA \times AMEL_{multiplier}$

$MDEL_{aquatic\ life} = LTA \times MDEL_{multiplier}$

AMEL multipliers are based on a 95th percentile occurrence probability, and the MDEL multipliers are based on the 99th percentile occurrence probability. If the number of samples is less than four (4), the default number of samples to be used is four (4).

For free cyanide, the following data was used to develop the AMEL and MDEL for aquatic life using Table 2 of the SIP:

No. of Samples	CV	$Multiplier_{MDEL}$	$Multiplier_{AMEL}$
1	0.6	3.11	1.55

$AMEL_{aquatic\ life}$ = 2.74 x 1.55 = 4.3 µg/L

$MDEL_{aquatic\ life}$ = 2.74 x 3.11 = 8.5 µg/L

Step 5: For the ECA based on human health, set the AMEL equal to the $ECA_{human\ health}$

$AMEL_{human\ health} = ECA_{human\ health}$

For free cyanide:

$AMEL_{human\ health}$ = 220,000 µg/L

Step 6: Calculate the MDEL for human health by multiplying the AMEL by the ratio of the $Multiplier_{MDEL}$ to the $Multiplier_{AMEL}$. Table 2 of the SIP provides pre-calculated ratios to be used in this calculation based on the CV and the number of samples.

$MDEL_{human\ health} = AMEL_{human\ health}$ x ($Multiplier_{MDEL}$ / $Multiplier_{AMEL}$)

For free cyanide, the following data was used to develop the $MDEL_{human\ health}$:

No. of Samples	CV	$Multiplier_{MDEL}$	$Multiplier_{AMEL}$	Ratio
1	0.6	3.11	1.55	2.01

$MDEL_{human\ health}$ = 220,000 µg/L x 2.01 = 442,200 µg/L

Step 7: Select the lower of the AMEL and MDEL based on aquatic life and human health as the water-quality based effluent limit for the Order.

For cyanide:

$AMEL_{aquatic\ life}$	$MDEL_{aquatic\ life}$	$AMEL_{human\ health}$	$MDEL_{human\ health}$
4.3 µg/L	8.5 µg/L	220,000 µg/L	442,200 µg/L

The lowest (most restrictive) effluent limits, those based on aquatic life criteria, were incorporated into this Order.

5. WQBEL based on Basin Plan Objectives

a. The Basin Plan states that any discharge to the Central Drain 3-D No. 1 *(Imperial Valley Drain)* shall not cause concentration of TDS in the surface water to exceed a maximum of 4,500 mg/L and an annual average of 4,000 mg/L. Therefore, receiving water limitations for TDS are included in the Order and are based on the maximum effluent limitation provided in the Basin Plan.

b. Previous Order No. 00-100 established WQBEL for E. Coli, which is carried forward in this Order. The Basin Plan states that any discharge to a waterbody with a REC1 designated use shall not have an Escherichia coli (E. coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 milliliters. The Basin Plan contains receiving water limitations for enterococci and fecal coliform. E.coli is an indicator parameter for enterococci and fecal coliform. Therefore, effluent limitations for enterococci and fecal coliform are not included in the Order.

c. Previous Order No. 00-100 established WQBEL for pH based on WQO established in the Basin Plan and are carried forward in this Order.

d. Previous Order No. 00-100 established WQBEL for total residual chlorine based on WQO established in the Basin Plan and are carried forward in this Order.

6. Final WQBELs

Summaries of the WQBELs required by this Order are described in Table F-9 below. Mass-based effluent limitations are based on a design capacity of 0.810 MGD.

Table F-9 Summary of Water Quality-based Effluent Limitations: Monitoring Location EFF-001

Parameter	Units	Effluent Limitations				
		Annual Average	Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
E. Coli	MPN/100mL	---	126	400	---	---
pH	s.u.	---	---	---	6.0	9.0
Chlorine, Total Residual	mg/L	---	0.01	---	---	0.02
	lbs/day	---	0.07	---	---	0.1
Copper, Total Recoverable	µg/L	---	2.9	5.8	---	---
	lbs/day	---	0.020	0.039	---	---
Lead, Total Recoverable	µg/L	---	7	14	---	---
	lbs/day	---	0.047	0.095	---	---
Zinc, Total Recoverable	µg/L	---	47	95	---	---
	lbs/day	---	0.32	0.64	---	---
Free Cyanide	µg/L	---	4.3	8.5	---	---
	lbs/day	---	0.029	0.057	---	---

7. Whole Effluent Toxicity (WET)

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a shorter time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth. The WQBEL for acute toxicity has been retained from previous Order No. 00-100.

The Basin Plan specifies a narrative objective for toxicity, requiring that all waters be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alterations in population, community ecology, or receiving water biota.

In addition to the Basin Plan requirements, Section 4 of the SIP states that a chronic toxicity effluent limitation is required in permits for all discharges that will cause, have the reasonable potential to cause, or contribute to chronic toxicity in receiving waters. Therefore, in accordance with the SIP, this Order requires the Discharger to conduct chronic toxicity testing for discharges to the Central Drain 3-D No. 1. In addition, the Order establishes thresholds that when exceeded requires the Discharger to conduct accelerated toxicity testing and/or conduct toxicity identification evaluation (TIE) studies.

D. Final Effluent Limitations

Summaries of the final effluent limitations required by this Order are described in Table F-10 and the text below. These effluent limitations are applicable to Discharge Point 001.

Table F-10 Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Flow	MGD	0.810	---	---	---	---	
Biochemical Oxygen Demand (BOD) (5-day @ 20°C)	mg/L	30	45	---	---	---	40 CFR 133
	lbs/day	200	300	---	---	---	
pH	standard units	---	---	---	6.0	9.0	40 CFR 133
Total Suspended Solids (TSS)	mg/L	30	45	---	---	---	40 CFR 133
	lbs/day	200	300	---	---	---	
Removal Efficiency for BOD and TSS	%	85	---	---	---	---	40 CFR 133
Copper, Total Recoverable	µg/L	2.9	---	5.8	---	---	CTR, SIP
	lbs/day	0.020	---	0.039	---	---	
Lead, Total Recoverable	µg/L	7.0	---	14	---	---	CTR, SIP
	lbs/day	0.047	---	0.095	---	---	
Zinc, Total Recoverable	µg/L	47	---	95	---	---	CTR, SIP
	lbs/day	0.32	---	0.64	---	---	

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Free Cyanide	µg/L	4.3	---	8.5	---	---	CTR, SIP
	lbs/day	0.03	---	0.06	---	---	
Chlorine, Total Residual	mg/L	0.01	---	---	---	0.02	Basin Plan
	lbs/day	0.07	---	---	---	0.1	

a. Discharges of wastes or wastewater shall not increase the total dissolved solids content of receiving waters, unless it can be demonstrated to the satisfaction of the Regional Water Board that such an increase in total dissolved solids does not adversely affect beneficial uses of receiving waters.

b. There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the treatment plant effluent cause any acute or chronic 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. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or bioassays of appropriate duration or other appropriate methods specified by the Regional Water Board.

c. Wastewater effluent discharged to the Central Drain 3-D No. 1 *(Imperial Valley Drain)* shall not have a Escherichia coli (E. coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 milliliters.

E. Interim Effluent Limitations

Interim limits have been set as follows:

1. The governing Water Quality Criteria (WQC) for copper is 3.73 µg/L, the saltwater aquatic life criteria contained in the CTR. Copper has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 2.9 µg/L AMEL and 5.8 µg/L MDEL. The Discharger documented in its March 3, 2006 Feasibility Study that it is infeasible to comply immediately with the WQBELs. The Regional Water Board verified this assertion of infeasibility by comparing the MEC to the AMEL and MDEL. Therefore, pursuant to the provisions of the SIP, an interim effluent limit for copper is required. Section 2.2 of the SIP states numeric interim limitations must be based on current treatment Facility performance or on existing permit limitations, whichever is more stringent. The previous permit did not contain an effluent limit for copper. The Regional Water Board evaluated effluent monitoring data submitted for the May 2001 priority pollutant monitoring event to determine the interim limit. Insufficient data were available to statistically evaluate performance. The Regional Water Board set the interim limitation equal to the MEC value for copper, 21 µg/L, for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff.

2. The governing Water Quality Criteria (WQC) for lead is 8.52 µg/L, the saltwater aquatic life criteria contained in the CTR. Lead has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 7.0 µg/L AMEL and 14 µg/L MDEL. The Discharger is required to submit a Lead Feasibility Study by July 21, 2006 to demonstrate that it is infeasible to comply immediately with the WQBELs. Therefore, based on a review of self-monitoring data, an interim effluent limit for lead is required. The previous permit did not contain an effluent limit for lead. Insufficient data were available to statistically evaluate performance. The Regional Water Board set the interim limitation equal to the MEC value for lead, 16 µg/L, for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff. In accordance with Special Provision VI.C.2.f, if the Regional Water Board has not received the Lead Infeasibility Report by July 21, 2006, the final effluent limitations for lead, specified in Section IV.A.1.a of the Order are effective.

3. The governing Water Quality Criteria (WQC) for zinc is 85.62 µg/L, the saltwater aquatic life criteria contained in the CTR. Zinc has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 47 µg/L AMEL and 95 µg/L MDEL. The Discharger is required to submit a Zinc Feasibility Study by July 21, 2006 to demonstrate that it is infeasible to comply immediately with the WQBELs. Therefore, based on a review of self-monitoring data, an interim effluent limit for zinc is required. The previous permit did not contain an effluent limit for zinc. Insufficient data were available to statistically evaluate performance. The Regional Water Board set the interim limitation equal to the MEC value for zinc, 280 µg/L, for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff. In accordance with Special Provision VI.C.2.f, if the Regional Water Board has not received the Zinc Infeasibility Report by July 21, 2006, the final effluent limitations for zinc, specified in Section IV.A.1.a of the Order are effective.

4. The governing WQC for free cyanide is 5.2 µg/L, the freshwater aquatic life criteria contained in the CTR. Free cyanide has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to State Implementation Policy (SIP) procedures are 4.3 µg/L AMEL and 8.5 µg/L MDEL. The Discharger documented in its March 3, 2006 Feasibility Study that it is infeasible to comply immediately with the WQBELs. The Regional Water Board verified this assertion of infeasibility by comparing the MEC to the AMEL and MDEL. Therefore, pursuant to the provisions of the SIP, an interim effluent limit for cyanide is required. Section 2.2 of the SIP states numeric interim limitations must be based on current treatment Facility performance or on existing permit limitations, whichever is more stringent. The previous permit did not contain an effluent limit for free cyanide. The Regional Water Board evaluated effluent monitoring data submitted for the May 2001 priority pollutant monitoring event to determine the interim limit. Insufficient data were available to statistically evaluate performance. The Regional Water Board set the interim limitation equal to the MEC value for cyanide, 10 µg/L, for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff.

Table F-11 Interim Effluent Limitations

Parameter	Unit	Date Effluent Limit Becomes Effective	Maximum Daily Effluent Limit	Average Monthly Effluent Limit
Copper, Total Recoverable (interim)	µg/L	June 21, 2006	21	21
Copper, Total Recoverable (interim)	lbs/day[5]	June 21, 2006	0.14	0.14
Copper, Total Recoverable (final)	µg/L	May 18, 2010	5.8	2.9
Copper, Total Recoverable (final)	lbs/day[5]	May 18, 2010	0.039	0.020
Free Cyanide (interim)	µg/L	June 21, 2006	10	10
Free Cyanide (interim)	lbs/day[5]	June 21, 2006	0.68	0.68
Free Cyanide (final)	µg/L	May 18, 2010	8.5	4.3
Free Cyanide (final)	lbs/day[5]	May 18, 2010	0.057	0.029

F. Land Discharge Specifications – Not Applicable

G. Reclamation Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

The surface water receiving water limitations in the proposed Order are based upon the water quality objectives contained in the Basin Plan and are carried over from the previous Order. As such, they are a required part of the proposed Order.

Also, a new receiving water limitation was added for TDS based on the regional boards basin plan as follows:
The concentration of total dissolved solids in Central Drain 3-D No. 1 to exceed an annual average concentration of 4,000 mg/L or an instantaneous maximum concentration of 4,500 mg/L

B. Groundwater

The groundwater receiving water limitations in the proposed Order are based upon the water quality objectives contained in the Basin Plan and are carried over from the previous Order. As such, they are a required part of the proposed Order.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 CFR requires all NPDES permits to specify recording and reporting of monitoring results. Sections 13267 and 13383 of the California Water Code authorize the Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program, Attachment E of this Order, establishes monitoring and reporting requirements to implement Federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the Monitoring and Reporting Program for this Facility.

[5] The mass-based effluent limitations are based on a design capacity of 0.810 MGD.

A. Influent Monitoring

The Order establishes influent monitoring requirements to allow the Discharger to establish compliance with BOD_5 and TSS net removal limitations.

B. Effluent Monitoring

Monitoring for those pollutants expected to be present in the discharge line immediately following treatment and before it joins or is diluted by any other waste stream, body of water, or substance will be required as shown on the proposed MRP (Attachment E) and as required in the SIP. Monitoring frequencies for all constituents carried forward from the previous Order have been retained. The monitoring frequency of 1/Month for copper and cyanide is appropriate because those pollutants have been detected in the effluent at levels above final WQBELs. Due to insufficient data for priority pollutants, a monitoring frequency of 1/Year has been included in this Order. The previous Order included an effluent monitoring requirement for dioxin. Due to the inclusion of dioxin monitoring in the priority pollutant monitoring requires of this Order, the dioxin specific monitoring requirement has been removed.

The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are given in the MRP (Attachment E). This provision requires compliance with the MRP, and is based on 40 CFR §§122.44 (i), 122.62, 122.63, and 124.5.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth. Acute toxicity testing requirements have been carried forward from the previous Order. The monitoring frequency of 1/Quarter for chronic toxicity is justified due to toxic pollutant detection in the effluent.

This requirement establishes conditions and protocol by which compliance with the Basin Plan narrative water quality objective for toxicity will be demonstrated and in accordance with Section 4.0 of the SIP. Conditions include required monitoring and evaluation of the effluent for acute and chronic toxicity and numerical values for chronic toxicity evaluation to be used as 'triggers' for initiating accelerated monitoring and toxicity reduction evaluation(s).

The WET Testing Requirements contained in Attachment E, Monitoring and Reporting Program, Section V were developed based on the Draft National Whole Effluent Toxicity Implementation Guidance Under the NPDES Program developed by USEPA (Docket ID. No. OW-2004-0037). This is the most current guidance available to the Regional Water Board. This Order includes a reopener to allow the requirements of this section to be revised pending the issuance of final guidance or policies developed by either the USEPA or State Water Board.

D. Receiving Water Monitoring

1. Surface Water

Surface water monitoring is required to determine compliance with receiving water limitations and to characterize the water quality of the receiving water pursuant to the SIP and Basin Plan. Monitoring frequencies for all constituents carried forward from the previous Order have been retained. Due to insufficient data for priority pollutants, the annual monitoring frequency has been included in this Order.

2. Groundwater – Not Applicable

E. Other Monitoring Requirements

1. Priority Pollutant Metals Monitoring

Section 1.3 of the SIP states that the Regional Water Boards will require periodic monitoring (at least once prior to issuance and reissuance of a permit) for pollutants for which criteria or objectives apply and for which no effluent limitations have been established. This Order implements these requirements by May 18, 2010 and will use future monitoring data to determine reasonable potential and WQBELs as necessary.

2. Water Supply Monitoring

The Discharger is required to obtain or acquire quarterly total dissolved solids concentrations of the source water, either through monitoring or obtaining the data from the drinking water purveyor. This information will be compiled and summarized in a quarterly report, in accordance with Provision VI.C.2.e of the Order.

3. Biosolids/Sludge Monitoring

This section establishes monitoring and reporting requirements for the storage, handling and disposal practices of sludge generated from the operation of this Facility.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which in accordance with 40 CFR §§122.41 and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D to this Order and are carried forward from previous Order No. 00-100.

Title 40 CFR §§122.41(a)(1) and (b) through (n) establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. 40 CFR §123.25(a)(12) allows the State to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR §123.25, this Order omits Federal conditions that address enforcement authority specified in 40 CFR §§122.41(j)(5) and (k)(2) because the enforcement authority under the CWC is more stringent. In lieu of these conditions, this Order incorporates by reference CWC Section 13387(e).

B. Special Provisions

1. Reopener Provisions

These provisions are based on 40 CFR §§123 and 122.62. The Regional Water Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new regulations, modification in sludge use or disposal practices, plant expansion, or adoption of new regulations by the State Water Board or Regional Water Board, including revisions to the Basin Plan.

2. Special Studies and Additional Monitoring Requirements

a. **Toxicity Identification Evaluations or Toxicity Reduction Evaluations.** This provision is based on the SIP, Section 4, Toxicity Control Provisions.

b. **Translator Study.** This provision is based on the SIP that allows the use of a translator for metals and selenium different than the USEPA conversion factor, provided the Discharger requests this action and completes a translator study within two years from the date of the issuance of this permit as stated in the SIP.

c. **Antidegradation Analysis and Engineering Report for Proposed Plant Expansion.** This provision is based on State Water Resources Control Board Resolution No. 68-16, which requires the Regional Water Board in regulation the discharge of waste to maintain high quality waters of the State, the Discharger must demonstrate that it has implemented adequate controls (e.g., adequate treatment capacity) to ensure that high quality waters will be maintained. This provision requires the Discharger to clarify it has increased plant capacity through the addition of new treatment system(s) to obtain alternative effluent limitations for the discharge from the treatment system(s). This provision requires the Discharger to report specific time schedules for the planned projects. This provision requires the Discharger to submit the report to the Regional Water Board for approval.

d. **Operations Plan for Proposed Plant Expansion.** This provision is based on Section 13385(j)(1)(D) of the CWC and allows a time period not to exceed 90 days in which the Discharger may adjust and test the treatment system(s). This provision requires the Discharger to submit an Operations Plan describing the actions the Discharger will take during the period of adjusting and testing to prevent violations.

e. **Total Dissolved Solids (TDS) Study.** The purpose of this study is to provide more detailed information on the Regional Board's development of salinity standards pursuant to Section 303 and through the NPDES permitting authority in the regulation of municipal and industrial sources (See Section 402 of the Federal Water Pollution Control Act.). As part of the Regional Board's development of salinity standards, the Regional Board is requiring a study to determine what is a reasonable increase in salinity for municipal discharges to surface waters and its impact on the beneficial uses of waters of the United States. As part of the 1996 Review of the Water Quality Standards for Salinity of the Colorado River System dated June 1996, the study proposed that an incremental increase in salinity shall be 400 mg/L or less, which is considered to be a reasonable incremental increase above the flow weighted average salinity of the source water supply. As part of this permit, the Discharger is required to perform a study to evaluate whether a 400 mg/L incremental increase in salinity above the source water is practical and if not, what incremental increase is practical for their discharge. This report shall be submitted to the Regional Board's Executive Officer prior to the filing date for re-application.

f. **Lead and Zinc Infeasibility Report.** This provision is based on the SIP, Section 2.1 of the SIP, Compliance Schedules.

3. Best Management Practices and Pollution Prevention

a. **Pollution Minimization Plan.** This provision is based on Section 2.4.5. of the SIP.

b. **Storm Water.** This provision is based on the requirements of the General Storm Water Permit (NPDES Permit No. CAS000001).

4. Compliance Schedules

a. **Compliance Plan.** This Order establishes final effluent limitations for copper and cyanide that are new limits for the Facility. This Order also contains interim effluent limitations and a compliance schedule that provides the Discharge time to bring their Facility into compliance with the newly established final limits. In accordance with Section 2.1 of the SIP, interim limits and compliance schedules can only be provided by the Regional Water Board after the Discharger has submitted a report that demonstrates and justifies that it is infeasible for the Discharger to achieve immediate compliance with newly established final effluent limitations. Infeasible means not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors. The Discharger submitted an Infeasibility Report on March 2, 2006 and is required to provide a compliance plan to the Regional Water Board by June 21, 2007 that identified the measures that will be taken to reduce the concentrations of copper and cyanide in their discharge.

5. Construction, Operation, and Maintenance Specifications

This provision is based on the requirements of 40 CFR §122.41(e) and the previous Order.

6. Special Provisions for Municipal Facilities (POTWs Only)

a. Sludge Disposal Requirements. This provision is based on 40 CFR Part 503 and the requirements of Section IX.B. of the Monitoring and Reporting Program (Attachment E).

b. Pretreatment. This provision is based on 40 CFR Part 403 and the Federal CWA.

7. Other Special Provisions – Not Applicable

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for Heber Municipal Wastewater Treatment Plant. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through the following newspapers: Desert Sun and Imperial Valley Press.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments should be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on May 22, 2006.

C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: June 21, 2006
Time: 10:00 a.m.
Location: City of Council Chambers
City of La Quinta
78-495 Calle Tampico
La Quinta, CA 92253

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our web address is **http://www.waterboards.ca.gov/coloradoriver/** where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (ROWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (760) 346-7491.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this Facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Kirk Larkin at (760) 776-8964.

ATTACHMENT G – LIST OF PRIORITY POLLUTANTS

Table G-1 List of Priority Pollutants

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
1	Antimony	7440360	EPA 6020/200.8
2	Arsenic	7440382	EPA 1632
3	Beryllium	7440417	EPA 6020/200.8
4	Cadmium	7440439	EPA 1638/200.8
5a	Chromium (III)	16065831	EPA 6020/200.8
5a	Chromium (VI)	18540299	EPA 7199/1636
6	Copper	7440508	EPA 6020/200.8
7	Lead	7439921	EPA 1638
8	Mercury	7439976	EPA 1669/1631
9	Nickel	7440020	EPA 6020/200.8
10	Selenium	7782492	EPA 6020/200.8
11	Silver	7440224	EPA 6020/200.8
12	Thallium	7440280	EPA 6020/200.8
13	Zinc	7440666	EPA 6020/200.8
14	Cyanide	57125	EPA 9012A
15	Asbestos	1332214	EPA/600/R-93/116(PCM)
16	2,3,7,8-TCDD	1746016	EPA 8290 (HRGC) MS
17	Acrolein	107028	EPA 8260B
18	Acrylonitrile	107131	EPA 8260B
19	Benzene	71432	EPA 8260B
20	Bromoform	75252	EPA 8260B
21	Carbon Tetrachloride	56235	EPA 8260B
22	Chlorobenzene	108907	EPA 8260B
23	Chlorodibromomethane	124481	EPA 8260B
24	Chloroethane	75003	EPA 8260B
25	2-Chloroethylvinyl Ether	110758	EPA 8260B
26	Chloroform	67663	EPA 8260B
27	Dichlorobromomethane	75274	EPA 8260B
28	1,1-Dichloroethane	75343	EPA 8260B
29	1,2-Dichloroethane	107062	EPA 8260B
30	1,1-Dichloroethylene	75354	EPA 8260B
31	1,2-Dichloropropane	78875	EPA 8260B
32	1,3-Dichloropropylene	542756	EPA 8260B
33	Ethylbenzene	100414	EPA 8260B
34	Methyl Bromide	74839	EPA 8260B
35	Methyl Chloride	74873	EPA 8260B
36	Methylene Chloride	75092	EPA 8260B
37	1,1,2,2-Tetrachloroethane	79345	EPA 8260B
38	Tetrachloroethylene	127184	EPA 8260B
39	Toluene	108883	EPA 8260B
40	1,2-Trans-Dichloroethylene	156605	EPA 8260B

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
41	1,1,1-Trichloroethane	71556	EPA 8260B
42	1,12-Trichloroethane	79005	EPA 8260B
43	Trichloroethylene	79016	EPA 8260B
44	Vinyl Chloride	75014	EPA 8260B
45	2-Chlorophenol	95578	EPA 8270C
46	2,4-Dichlorophenol	120832	EPA 8270C
47	2,4-Dimethylphenol	105679	EPA 8270C
48	2-Methyl-4,6-Dinitrophenol	534521	EPA 8270C
49	2,4-Dinitrophenol	51285	EPA 8270C
50	2-Nitrophenol	88755	EPA 8270C
51	4-Nitrophenol	100027	EPA 8270C
52	3-Methyl-4-Chlorophenol	59507	EPA 8270C
53	Pentachlorophenol	87865	EPA 8270C
54	Phenol	108952	EPA 8270C
55	2,4,6-Trichlorophenol	88062	EPA 8270C
56	Acenaphthene	83329	EPA 8270C
57	Acenaphthylene	208968	EPA 8270C
58	Anthracene	120127	EPA 8270C
59	Benzidine	92875	EPA 8270C
60	Benzo(a)Anthracene	56553	EPA 8270C
61	Benzo(a)Pyrene	50328	EPA 8270C
62	Benzo(b)Fluoranthene	205992	EPA 8270C
63	Benzo(ghi)Perylene	191242	EPA 8270C
64	Benzo(k)Fluoranthene	207089	EPA 8270C
65	Bis(2-Chloroethoxy)Methane	111911	EPA 8270C
66	Bis(2-Chloroethyl)Ether	111444	EPA 8270C
67	Bis(2-Chloroisopropyl)Ether	108601	EPA 8270C
68	Bis(2-Ethylhexyl)Phthalate	117817	EPA 8270C
69	4-Bromophenyl Phenyl Ether	101553	EPA 8270C
70	Butylbenzyl Phthalate	85687	EPA 8270C
71	2-Chloronaphthalene	91587	EPA 8270C
72	4-Chlorophenyl Phenyl Ether	7005723	EPA 8270C
73	Chrysene	218019	EPA 8270C
74	Dibenzo(a,h)Anthracene	53703	EPA 8270C
75	1,2-Dichlorobenzene	95501	EPA 8260B
76	1,3-Dichlorobenzene	541731	EPA 8260B
77	1,4-Dichlorobenzene	106467	EPA 8260B
78	3,3'-Dichlorobenzidine	91941	EPA 8270C
79	Diethyl Phthalate	84662	EPA 8270C
80	Dimethyl Phthalate	131113	EPA 8270C
81	Di-n-Butyl Phthalate	84742	EPA 8270C
82	2,4-Dinitrotoluene	121142	EPA 8270C
83	2,6-Dinitrotoluene	606202	EPA 8270C
84	Di-n-Octyl Phthalate	117840	EPA 8270C
85	1,2-Diphenylhydrazine	122667	EPA 8270C
86	Fluoranthene	206440	EPA 8270C
87	Fluorene	86737	EPA 8270C
88	Hexachlorobenzene	118741	EPA 8260B
89	Hexachlorobutadiene	87863	EPA 8260B

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
90	Hexachlorocyclopentadiene	77474	EPA 8270C
91	Hexachloroethane	67721	EPA 8260B
92	Indeno (1,2,3-cd)Pyrene	193395	EPA 8270C
93	Isophorone	78591	EPA 8270C
94	Naphthalene	91203	EPA 8260B
95	Nitrobenzene	98953	EPA 8270C
96	N-Nitrosodimethylamine	62759	EPA 8270C
97	N-Nitrosodi-n-Propylamine	621647	EPA 8270C
98	N-Nitrosodiphenylamine	86306	EPA 8270C
99	Phenanthrene	85018	EPA 8270C
100	Pyrene	129000	EPA 8270C
101	1,2,4-Trichlorobenzene	120821	EPA 8260B
102	Aldrin	309002	EPA 8081A
103	alpha-BHC	319846	EPA 8081A
104	beta-BHC	319857	EPA 8081A
105	gamma-BHC	58899	EPA 8081A
106	delta-BHC	319868	EPA 8081A
107	Chlordane	57749	EPA 8081A
108	4,4'-DDT	50293	EPA 8081A
109	4,4'-DDE	72559	EPA 8081A
110	4,4'-DDD	72548	EPA 8081A
111	Dieldrin	60571	EPA 8081A
112	alpha-Endosulfan	959988	EPA 8081A
113	beta-Endosulfan	33213659	EPA 8081A
114	Endosulfan Sulfate	1031078	EPA 8081A
115	Endrin	72208	EPA 8081A
116	Endrin Aldehyde	7421934	EPA 8081A
117	Heptachlor	76448	EPA 8081A
118	Heptachlor Epoxide	1024573	EPA 8081A
119	PCB-1016	12674112	EPA 8082
120	PCB-1221	11104282	EPA 8082
121	PCB-1232	11141165	EPA 8082
122	PCB-1242	53469219	EPA 8082
123	PCB-1248	12672296	EPA 8082
124	PCB-1254	11097691	EPA 8082
125	PCB-1260	11096825	EPA 8082
126	Toxaphene	8001352	EPA 8081A

ATTACHMENT H – SUMMARY OF WQBELS CALCULATIONS

The WQBELs developed for this Order are summarized below and were calculated as described in the methodology summarized in Attachment F, Fact Sheet and are contained in Section IV.A.1.a of this Order.

Table H-1 Summary of WQBELs Calculations

Priority Pollutant	Human Health Calculations			Aquatic Life Calculations											Selected Limits	
	Human Health			Saltwater / Freshwater												
	AMEL = ECA = C hh	MDEL/AMEL multiplier	MDEL hh	ECA acute = C acute	ECA acute multiplier	LTA acute	ECA chronic = C chronic	ECA chronic multiplier	LTA chronic	Lowest LTA	AMEL multiplier 95	AMEL aquatic life	MDEL multiplier 99	MDEL aquatic life	AMEL	MDEL
	ug/L		ug/L	ug/L		ug/L	ug/L		ug/L	ug/L					ug/L	ug/L
Copper				5.78	0.32	1.86	3.73	0.53	1.97	1.86	1.55	2.88	3.11	5.78	2.9	5.8
Lead		2.01		220.82	0.32	70.90	8.52	0.53	4.49	4.49	1.55	6.97	3.11	13.991	7.0	14
Zinc		2.01		95.14	0.32	30.55	85.62	0.53	45.16	30.55	1.55	47.42	3.11	95.137	47	95
Free Cyanide	220,000	2.01	441,361	22	0.32	7.06	5.20	0.53	2.74	2.74	1.55	4.26	3.11	8.54	4.3	8.5

Notes:

C = Water Quality Criteria
hh = human health
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation
ECA = Effluent concentration allowance
LTA = Long-term average concentration

ATTACHMENT I – STATE WATER BOARD MINIMUM LEVELS

The Minimum Levels (MLs) in this appendix are for use in reporting and compliance determination purposes in accordance with section 2.4 of the State Implementation Policy. These MLs were derived from data for priority pollutants provided by State certified analytical laboratories in 1997 and 1998. These MLs shall be used until new values are adopted by the SWRCB and become effective. The following tables (Tables 2a - 2d) present MLs for four major chemical groupings: volatile substances, semi-volatile substances, inorganics, and pesticides and PCBs.

Table I-1 Volatile Substances

Table 2a - VOLATILE SUBSTANCES*	GC	GCMS
1,1 Dichloroethane	0.5	1
1,1 Dichloroethylene	0.5	2
1,1,1 Trichloroethane	0.5	2
1,1,2 Trichloroethane	0.5	2
1,1,2,2 Tetrachloroethane	0.5	1
1,2 Dichlorobenzene (volatile)	0.5	2
1,2 Dichloroethane	0.5	2
1,2 Dichloropropane	0.5	1
1,3 Dichlorobenzene (volatile)	0.5	2
1,3 Dichloropropene (volatile)	0.5	2
1,4 Dichlorobenzene (volatile)	0.5	2
Acrolein	2.0	5
Acrylonitrile	2.0	2
Benzene	0.5	2
Bromoform	0.5	2
Methyl Bromide	1.0	2
Carbon Tetrachloride	0.5	2
Chlorobenzene	0.5	2
Chlorodibromo-methane	0.5	2
Chloroethane	0.5	2
Chloroform	0.5	2
Chloromethane	0.5	2
Dichlorobromo-methane	0.5	2
Dichloromethane	0.5	2
Ethylbenzene	0.5	2
Tetrachloroethylene	0.5	2
Toluene	0.5	2
Trans-1,2 Dichloroethylene	0.5	1
Trichloroethene	0.5	2
Vinyl Chloride	0.5	2

* The normal method-specific factor for these substances is 1; therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

Table I-2 Semi-Volatile Substances

Table 2b - SEMI-VOLATILE SUBSTANCES*	GC	GCMS	LC	COLOR
Benzo (a) Anthracene	10	5		
1,2 Dichlorobenzene (semivolatile)	2	2		
1,2 Diphenylhydrazine		1		
1,2,4 Trichlorobenzene	1	5		
1,3 Dichlorobenzene (semivolatile)	2	1		
1,4 Dichlorobenzene (semivolatile)	2	1		
2 Chlorophenol	2	5		
2,4 Dichlorophenol	1	5		
2,4 Dimethylphenol	1	2		
2,4 Dinitrophenol	5	5		
2,4 Dinitrotoluene	10	5		
2,4,6 Trichlorophenol	10	10		
2,6 Dinitrotoluene		5		
2- Nitrophenol		10		
2-Chloroethyl vinyl ether	1	1		
2-Chloronaphthalene		10		
3,3' Dichlorobenzidine		5		
Benzo (b) Fluoranthene		10	10	
3-Methyl-Chlorophenol	5	1		
4,6 Dinitro-2-methylphenol	10	5		
4- Nitrophenol	5	10		
4-Bromophenyl phenyl ether	10	5		
4-Chlorophenyl phenyl ether		5		
Acenaphthene	1	1	0.5	
Acenaphthylene		10	0.2	
Anthracene		10	2	
Benzidine		5		
Benzo(a) pyrene		10	2	
Benzo(g,h,i)perylene		5	0.1	
Benzo(k)fluoranthene		10	2	
bis 2-(1-Chloroethoxyl) methane		5		
bis(2-chloroethyl) ether	10	1		
bis(2-Chloroisopropyl) ether	10	2		
bis(2-Ethylhexyl) phthalate	10	5		
Butyl benzyl phthalate	10	10		
Chrysene		10	5	
di-n-Butyl phthalate		10		
di-n-Octyl phthalate		10		
Dibenzo(a,h)-anthracene		10	0.1	
Diethyl phthalate	10	2		
Dimethyl phthalate	10	2		
Fluoranthene	10	1	0.05	
Fluorene		10	0.1	
Hexachloro-cyclopentadiene	5	5		
Hexachlorobenzene	5	1		
Hexachlorobutadiene	5	1		
Hexachloroethane	5	1		

Table 2b - SEMI-VOLATILE SUBSTANCES*	GC	GCMS	LC	COLOR
Indeno(1,2,3,cd)-pyrene		10	0.05	
Isophorone	10	1		
N-Nitroso diphenyl amine	10	1		
N-Nitroso-dimethyl amine	10	5		
N-Nitroso -di n-propyl amine	10	5		
Naphthalene	10	1	0.2	
Nitrobenzene	10	1		
Pentachlorophenol	1	5		
Phenanthrene		5	0.05	
Phenol **	1	1		50
Pyrene		10	0.05	

* With the exception of phenol by colorimetric technique, the normal method-specific factor for these substances is 1,000; therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 1,000.

** Phenol by colorimetric technique has a factor of 1.

Table I-3 Inorganics

Table 2c – INORGANICS*	FAA	GFAA	ICP	ICPMS	SPGFAA	HYDRIDE	CVAA	COLOR	DCP
Antimony	10	5	50	0.5	5	0.5			1,000
Arsenic		2	10	2	2	1		20	1,000
Beryllium	20	0.5	2	0.5	1				1,000
Cadmium	10	0.5	10	0.25	0.5				1,000
Chromium (total)	50	2	10	0.5	1				1,000
Chromium VI	5							10	
Copper	25	5	10	0.5	2				1,000
Cyanide								5	
Lead	20	5	5	0.5	2				10,000
Mercury				0.5			0.2		
Nickel	50	5	20	1	5				1,000
Selenium		5	10	2	5	1			1,000
Silver	10	1	10	0.25	2				1,000
Thallium	10	2	10	1	5				1,000
Zinc	20		20	1	10				1,000

* The normal method-specific factor for these substances is 1; therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

Table I-4 Pesticides and PCBs

Table 2d – PESTICIDES – PCBs*	GC
4,4'-DDD	0.05
4,4'-DDE	0.05
4,4'-DDT	0.01
a-Endosulfan	0.02
alpha-BHC	0.01
Aldrin	0.005
b-Endosulfan	0.01
Beta-BHC	0.005
Chlordane	0.1
Delta-BHC	0.005
Dieldrin	0.01
Endosulfan Sulfate	0.05
Endrin	0.01
Endrin Aldehyde	0.01
Heptachlor	0.01
Heptachlor Epoxide	0.01
Gamma-BHC (Lindane)	0.02
PCB 1016	0.5
PCB 1221	0.5
PCB 1232	0.5
PCB 1242	0.5
PCB 1248	0.5
PCB 1254	0.5
PCB 1260	0.5
Toxaphene	0.5

* The normal method-specific factor for these substances is 100; therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 100.

Techniques:

GC - Gas Chromatography
GCMS - Gas Chromatography/Mass Spectrometry
HRGCMS - High Resolution Gas Chromatography/Mass Spectrometry (i.e., EPA 1613, 1624, or 1625)
LC - High Pressure Liquid Chromatography
FAA - Flame Atomic Absorption
GFAA - Graphite Furnace Atomic Absorption
HYDRIDE - Gaseous Hydride Atomic Absorption
CVAA - Cold Vapor Atomic Absorption
ICP - Inductively Coupled Plasma
ICPMS - Inductively Coupled Plasma/Mass Spectrometry
SPGFAA - Stabilized Platform Graphite Furnace Atomic Absorption (i.e., EPA 200.9)
DCP - Direct Current Plasma
COLOR - Colorimetric

APPENDIX C

HEBER PUBLIC UTILITY DISTRICT
WASTEWATER TREATMENT PLANT

ALTERNATIVE ANALYSIS ADDENDUM

Report prepared by

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AQUA ENGINEERING, INC.

April 2008

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1.0 HEBER PUBLIC UTILITIES DISTRICT – ALTERNATIVE ANALYSIS ADDENDUM

This addendum discusses and compares additional alternative treatment processes for the Heber Public Utility District wastewater treatment plant (WWTP) upgrade not addressed in the original preliminary engineering report (PER) prepared by The Holt Group in October of 2006. Specifically, this document will further consider secondary treatment alternatives, and disinfection systems. These new alternatives will be compared along with the alternatives presented in the 2006 report.

Each alternative will be evaluated for: its ability to meet the design criteria (influent flow, lbs BOD etc...); initial capital cost; operational, maintenance and energy costs; and non-economic criteria (i.e. process performance, effluent quality, expandability etc...). Design criteria, including future wastewater flows and influent loads (BOD, TSS), are taken from the October 2006 report and more recent 2007 flow data. These data were combined to establish the design criteria for this expansion and future expansions for the next 20 years. The design criteria are summarized in Table 1.

Table 1: Influent Flow Design Parameters

PHASE	DESIGN INFLUENT					DESIGN EFFLUENT		
	Flow MGD	Peak Hourly MGD	BOD (mg/L)	TSS (mg/L)	TKN (mg/L)	BOD (mg/L)	TSS (mg/L)	TKN (mg/L)
1st Expansion	1.2	2.64	350	325	50	< 30	< 30	< 10
2nd Expansion	2.0	4.40	350	325	50	< 30	< 30	< 10
3rd Expansion	2.4	5.30	350	325	50	< 30	< 30	< 10

Using these design criteria, several options regarding the upgrades to the secondary treatment and disinfection processes at the WWTP have been evaluated.

1.1 SECONDARY TREATMENT (BIOLOGICAL) ALTERNATIVES

The following four alternatives for secondary treatment were compared:

1) No Action Alternative
2) Oxidation Ditches
3) Aeration Basins
4) Integrated Fixed-film Activated Sludge (IFAS)

Each alternative is discussed in more detail in the following sections.

1.1.1 No Action Alternative

The existing oxidation ditches are at capacity with the current influent loads received at the WWTP. As per the 2006 report, the oxidation ditches have a total capacity of roughly 0.4 mgd. Peak day influent flows and loads to the WWTP already exceed this amount and are anticipated to exceed the design capacity of several processes at the WWTP in the next few years, including the biological capacity of the ditches, the secondary clarifiers and the chlorination system (Figure 1). Given the expected growth and projected future wastewater flows, the existing facilities at the WWTP will be inadequate. As the WWTP must be equipped to properly treat higher wastewater flows and loads, the no action alternative is deemed impractical and will not be considered further.

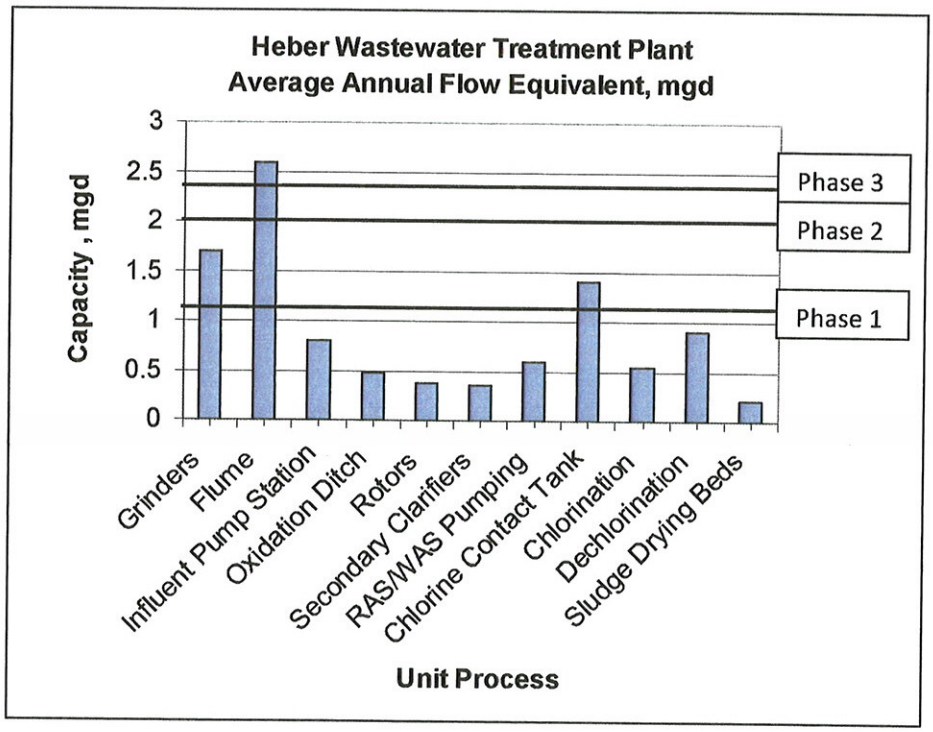


Figure 1: Current Process Capacities at the WWTP. Data from Holt Group, 2006 report.

1.1.2 Oxidation Ditches

The two existing oxidation ditches were designed for average daily flows of 0.4 mgd each, for a total treatment capacity of 0.8 mgd. However, due to increased loading concentrations with respect to BOD, the ditches have been de-rated to a total flow capacity of 0.4 MGD. The option of building additional oxidation ditches was analyzed to expand the WWTP capacity. The existing oxidation ditches are

approximately 260' long and 85' wide with a water depth of 5 feet. Expanding this technology to have the treatment capacity for even phase 1 would require four (4) more oxidation ditches of equal size. The space for these additional oxidation ditches is not available for phase 1, let-alone for phases 2 and 3. Thus, this option is also impractical and is not considered further.

1.1.3 Extended Aeration

This alternative would maintain operation of the existing oxidation ditches while new extended aeration basins are added to the process. The new aeration basins would consist of conventional rectangular reactors. The design parameters of each phase for this alternative are shown in Table 2 and a basic process schematic is shown in Figure 2.

Table 2: Aeration Basin General Design Parameters*

Average Flow, mgd	PHASE 1 1.2	PHASE 2 2.0	PHASE 3 2.4
Existing Oxidation Ditches, Total Capacity, mgd	0.4	0.4	Recommended to be abandoned at this time.
New Extended Aeration Process Capacity, mgd	0.8	1.6	2.4
New Extended Aeration Process Reactors, LxWxSWD	2 @ 175'x30'x15'	4 @ 175'x30'x15'	6 @ 175'x30'x15'
Total Number of 55'Ø Secondary Clarifiers	2	3	3

***Aeration basin design is based on criteria from the Holt Group 2006 report.**

Each 0.8 mgd capacity expansion of the extended aeration system would consist of two (2) parallel rectangular reactors with dimensions as shown in Table 2. The process design and operational factors for the extended aeration process in phase 1 are outlined in Table 3.

Each train is divided into two basins. The first basin is an anoxic zone where denitrification can occur and the second basin is the aeration basin where oxygen is provided to reduce the biochemical oxygen demand (BOD) and convert ammonia to nitrate (nitrification). Mixers will be installed in the anoxic basin, providing mixing without introducing oxygen, and fine bubble diffused aeration will be installed in the aeration basins.

Extended Aeration Schematic

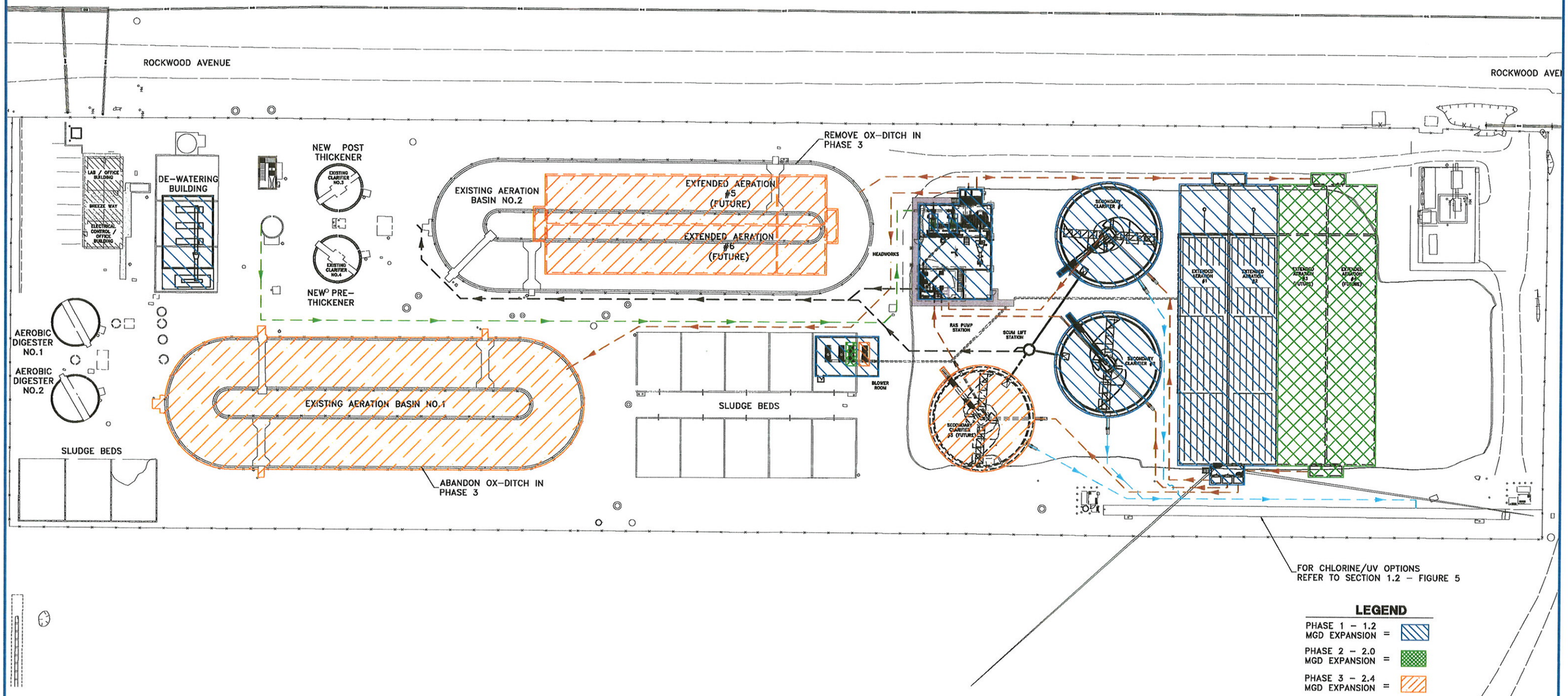


FIGURE: 2

Table 3: Extended Aeration Design Parameters

	PHASE 1	PHASE 2	PHASE 3
Design Flow, mgd	0.8	1.6	2.4
Number of Reactors	2	4	6
Dimensions, L x W x SWD*	175' x 30' x 15'		
Total Volume, MG	1.18	2.36	3.54
HRT, hrs	35.4	35.4	35.4
MLSS, mg/L	4,140	4,140	4,140
SRT, days*	25	25	25
Yield Coefficient, lb VSS/lb BOD5 removed*	0.67	0.67	0.67
RAS and WAS Concentration, mg/L*	10,000	10,000	10,000
Aeration System			
Design DO, mg/L*	2.4		
AOTR/SOTR*	0.3		
Actual O2 Required, lb/hr	120	235	350
Diffuser Type	Domes, Fine Bubble		
Assumed SOTR*	40%		
Process Air Required, scfm	960	1,900	2,850
Connected Horse Power	200	300	400

***These figures are taken/adapted from the Holt Group 2006 report.**

Advantages of Extended Aeration include:

- It is a proven, reliable technology
- Typically lower maintenance; with only regular mechanical maintenance needed for blowers which are not submerged.

Disadvantages of this process include:

- Higher energy costs associated with blower equipment.
- Larger footprint than other treatment alternatives, space is not available to build enough aeration tanks for phase 3 flows.
- Can be difficult to obtain/maintain design F/M and MLSS ratios in the basins.

This alternative would also install two (2) new 55' diameter secondary clarifiers to handle effluent from the aeration basins and the oxidation ditches. The old secondary clarifiers could be retrofitted into thickeners/digesters with diffuser air. An additional building would be required to house the blowers.

Phase 2 would construct another dual extended aeration basin and a third secondary clarifier. The final phase would abandon the two oxidation ditches and construct a third extended aeration basin. Cost estimates for this alternative are discussed in section 1.3 and detailed in the Appendix.

1.1.4 Integrated Fixed-film Activated Sludge (IFAS)/STM Aerotor

STM Aerotor (Figure 3) is an integrated fixed-film activated sludge (IFAS) process. This treatment process uses both fixed film and activated sludge to treat the waste stream. The system requires less energy and space than conventional activated sludge systems and is somewhat modular. It is relatively easy to operate since the fixed film bacteria and activated sludge create excellent settling sludge which greatly reduces the need for close monitoring of the sludge age and type. Also, the STM Aerotor system allows for excellent mixing and aeration without the expense and power costs associated with large blowers for aeration. The STM Aerotor alternative would also maintain the operation of the existing oxidation ditches during the first two upgrade phases. Table 4 outlines the basic design parameters for this alternative and a basic schematic design is shown in Figure 4.

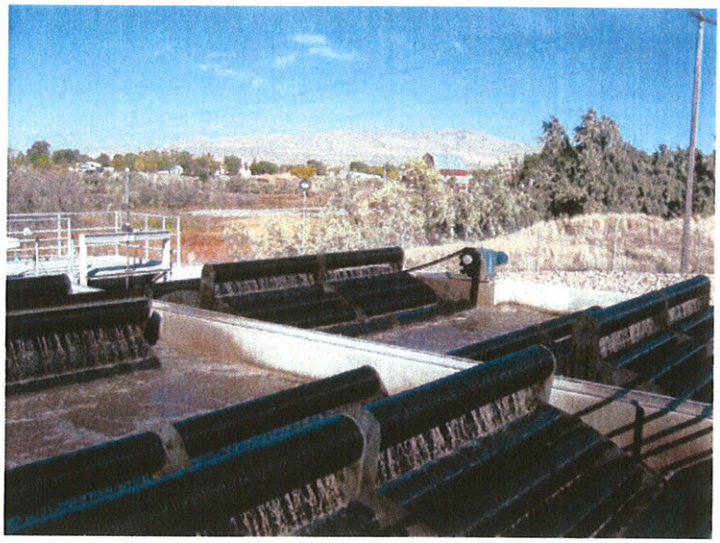


Figure 3: STM Aerotor Basin

Table 4: STM Aerotor Design

Total Wheels	6	12	18
Aerotor Basin Dimensions (each)	25' x 66' x 16.75'		
Total Aerotor Capacity, mgd	0.8	1.6	2.4
ANOXIC BASINS			
Number of Anoxic Basins	2	4	6
Anoxic Basin Dimensions	25' x 22.5' x 16.75'		
Total Anoxic Basin Volume, gal	140,960	281,920	422,880
Connected Horse Power	60	120	180

The trains for this alternative are similar to those of the extended aeration process. Each train has an anoxic zone where there is little to no dissolved oxygen, allowing denitrification to occur, followed by an aeration basin. However, with the aerotor process, the slow moving wheels provide the mixing and oxygen in the aeration basin required for BOD and nitrogen reduction. The aerators also provide surface area where fixed-film growth occurs and provides additional BOD and nitrogen reduction in the basin. The combination of activated sludge and fixed-film bacteria allow the more treatment capacity in a smaller footprint, which equates to smaller basin sizes than systems that utilize just activated sludge.

STM Aerotors have the following benefits:

- Creates a system with activated sludge and fixed film media, creating a better settling sludge.
- Increases the biological treatment capacity and efficiency.
- Small footprint.
- Low operation and maintenance costs.

Disadvantages of the system include:

- Capital costs of buying/installing the aerotor equipment can be higher than conventional aeration.
- Added maintenance of additional motors and drives.

Each phase of this alternative would construct an additional dual train STM Aerotor basin with anoxic basins. Construction of new secondary clarifiers and sludge treatment options are as described in the extended aeration alternative (section 1.1.3). Upon completion of the third phase, the two oxidation ditches would be decommissioned. Cost estimates for this alternative are discussed in section 1.3 and detailed in the Appendix.

STM Aerotor Design Schematic

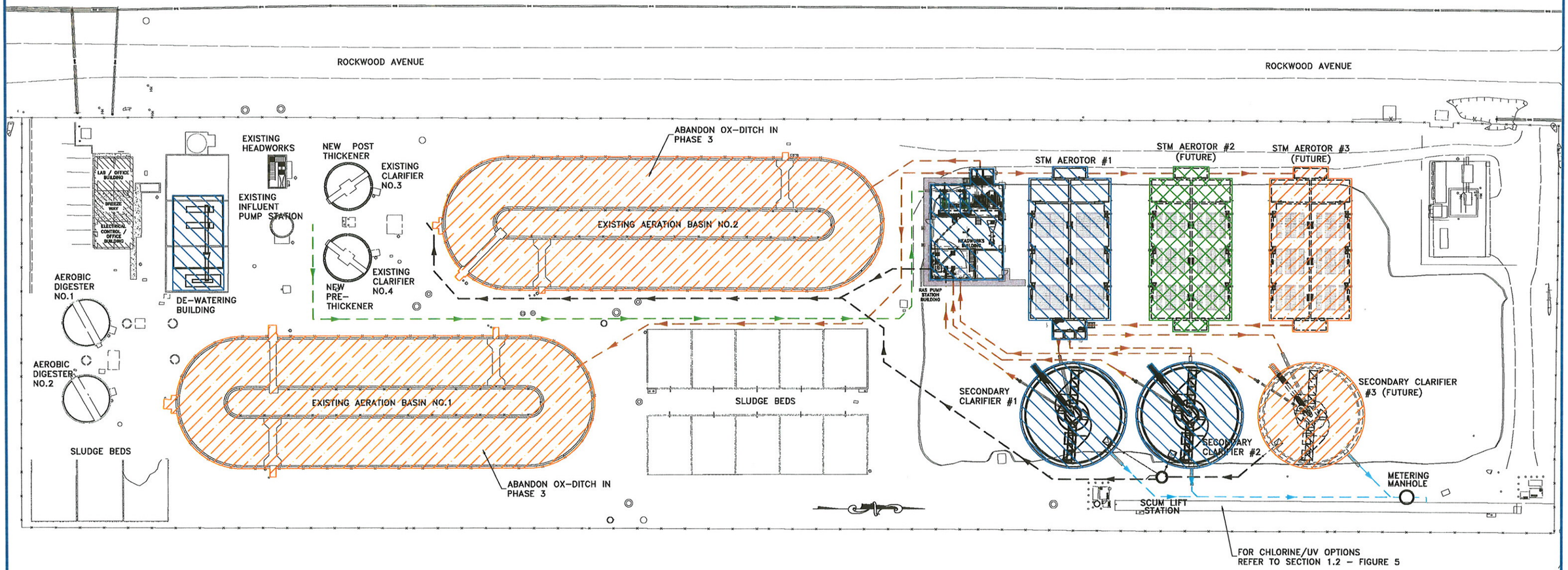


FIGURE: 4

1.2 DISINFECTION TREATMENT ALTERNATIVES

Two alternatives were considered to upgrade the disinfection process at the WWTP: 1) upgrade and expand the existing chlorination/dechlorination process or 2) convert the chlorine contact channel into a UV disinfection channel. These alternatives are discussed in more detail below.

1.2.1 Chlorine Disinfection

The existing chlorine contact basin and sulfonator (dechlorinator) have sufficient capacity for phase 1 (1.2 mgd) flow. However, the capacity of the existing chlorinators is less, at roughly 0.55 mgd (Holt Group, 2006). Thus, maintaining chlorine disinfection at the WWTP requires upgrading and expanding the disinfection system.

According to the 2006 report, a chlorine feed rate up to 225 lb/day would be required for the phase 1 expansion to 1.2 mgd. A 500 lb/day chlorinator with a 250 or 300 lb/day rotameter is recommended for phase 1. To feed 200+ lb/day, it will be necessary to manifold five (5) 150-lb cylinders together without "freezing" up the cylinders. To accommodate this, the existing chlorination structure will need to be replaced or upgraded (Holt Group, 2006).

The sulfonator has adequate capacity for flow up to roughly 1.2 mgd if the current 100 lb/day rotameter is changed to a 200 lb/day rotameter. The gas withdrawal system would also need to be modified to avoid freezing of the sulfonator units. Note that changing of chlorination and dechlorination rotameters is a routine maintenance operation, and would not impose a significant cost in and of itself to the WWTP (Holt Group, 2006). The increase in the amount of onsite chlorine and sulfur dioxide gas may require the plant's hazardous materials storage area to increase. In addition, the emergency planning manual would need to be updated. This alternative also requires installation of a new continuous chlorine recorder (Holt Group, 2006).

Thus, upgrading the disinfection process for phase 1 would require a new chlorination and dechlorination building, additional chlorination and dechlorination equipment, and some minor upgrades to the existing equipment (rotameters, manifolds etc...). Phases 2 and 3 will require the construction of additional contact basins and a complete overhaul of the existing equipment. The existing use of 150# cylinders will work for the Phase 1 expansion, but is not feasible for additional expansions. One (1) ton cylinders will be required for Phase 2 and 3 as well as new ancillary equipment

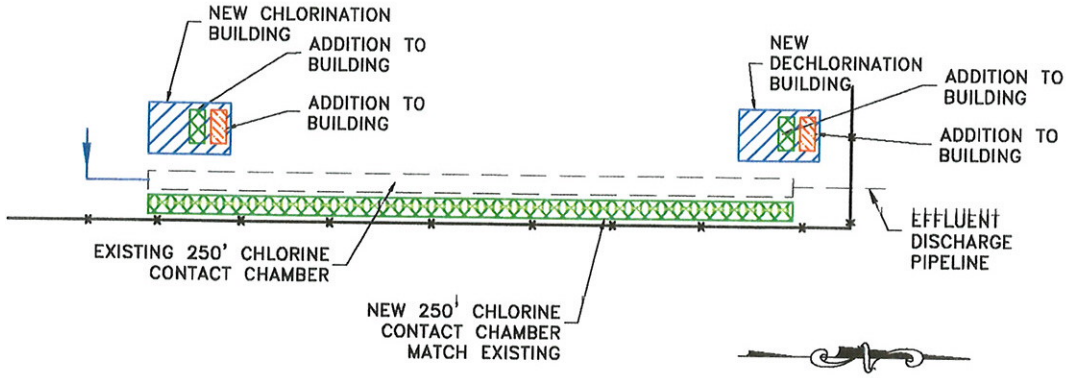
for chlorination and dechlorination (rotameters, manifolds, etc...). Figure 5 compares the site plan for chlorination/dechlorination with the proposed UV disinfection layout.

1.2.2 UV Disinfection

A dual-channel UV disinfection system could be installed in the existing chlorine contact basin. This alternative would remove the chlorination and dechlorination equipment, and divide the last 40 – 50 feet of the existing channel into two channels (Figure 5). UV modules would be installed in both channels, with effluent from both channels flowing over a finger or level controlling weir and into the existing 18" WWTP outfall pipe at the end of the channel. Each channel would contain sufficient UV equipment to provide full, 100% disinfection redundancy to the WWTP. Thus, at phase 3, each channel could treat 2.65 mgd average daily flow.

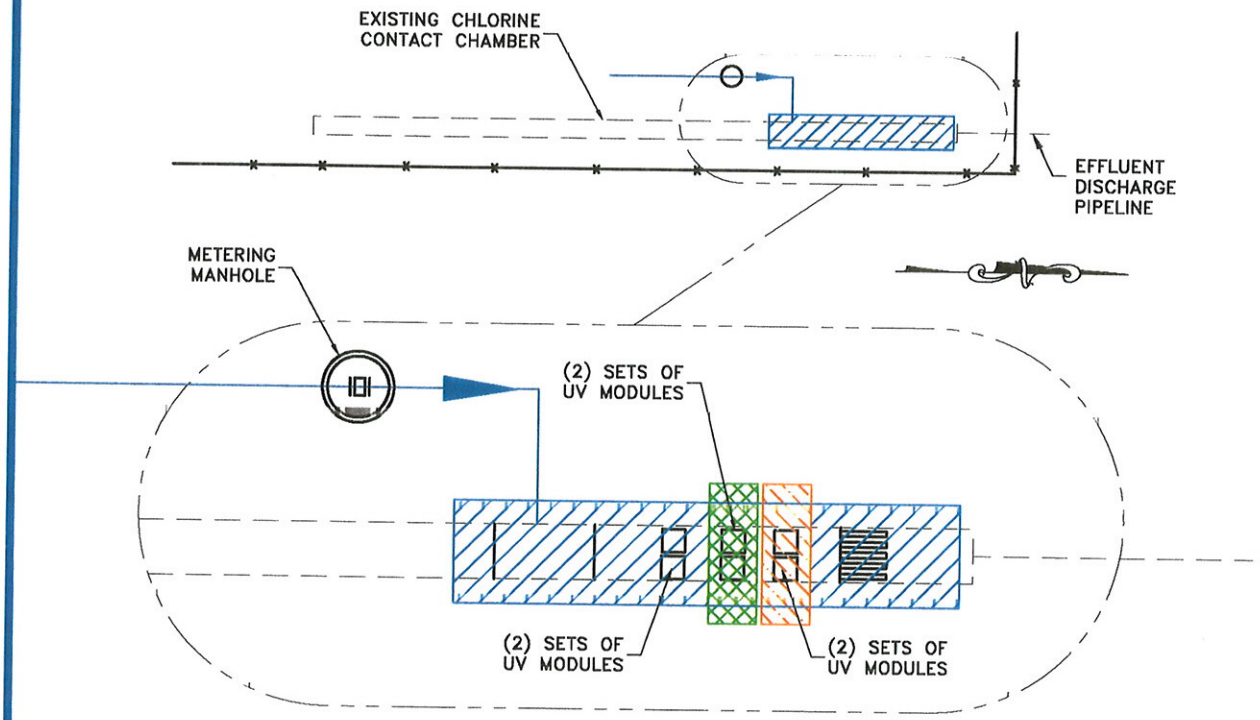
The phasing and upgrading of the UV equipment will depend on the selected manufacturer, but additional UV lamps would be added as flow dictates. This alternative has a higher initial cost than the chlorination option. However, it proves more cost effective in the long run, especially when phases 2 and 3 are implemented. Furthermore, UV disinfection is less complicated to run and requires less overall maintenance than the chlorination/dechlorination system.

UV vs. Chlorination Disinfection Configuration



CHLORINE CONTACT PLAN OPTION

SCALE: NTS



UV DISINFECTION PLAN OPTION

SCALE: NTS

LEGEND

PHASE 1 – 1,2 MGD EXPANSION =

PHASE 2 – 2.0 MGD EXPANSION =

PHASE 3 – 2.4 MGD EXPANSION =

FIGURE: 5

1.3 ALTERNATIVE ANALYSIS AND COMPARISON

Each secondary and disinfection alternative was analyzed with respect to the criteria mentioned in section 1.0. This section explains each of the criteria and discusses how well each alternative meets them. The alternatives are then ranked and scored with respect to each criterion to determine the best method for expanding each component of the WWTP.

1.3.1 Environmental

Environmental criteria analyze each alternative for its impact on land use, space requirements (footprint) and energy consumption.

All three expansion phases of the SMT Aerotor alternative fit on the existing WWTP property without impacting any existing structures. The extended aeration basins require removing at least one of the existing oxidation ditches and potentially acquiring more land to accommodate the Phase 3 expansion. Additional space would be required in the headworks building to house the blower equipment. Extended aeration uses more energy than the STM Aerotor due to the blower equipment associated with the aeration basins. The STM Aerotor alternative appears to better meet the Environmental criteria as it requires a smaller footprint and uses less energy.

All three expansion phases of the UV disinfection alternative can be contained in the existing chlorine contact basin with minimal space adjacent to the channel needed for control panels, hoists, and other associated equipment. The chlorination/dechlorination alternative would require additional volume, equal in size to the existing chlorine contact basin, for both phase 2 and 3. Furthermore, a new building would be necessary to house the chlorine and sulfur dioxide injection equipment. Another disadvantage of chlorination/dechlorination is the associated chemicals, including the risk of exposing the environment to residual chlorine in the water or chlorine gas. Chemical storage and injection will become increasingly complex as the system expands to treat increasing flows. However, UV disinfection will consume more energy than chlorination/dechlorination. Both alternatives have advantages and disadvantages regarding environmental criteria; however, the advantages of UV disinfection, including a smaller footprint and minimal chemical use, appear to outweigh its higher energy consumption.

1.3.2 Water Resources

Water resources evaluates the effluent quality provided by the alternative. Though more important where reuse water is desired, it still impacts the water quality of the outfall. Each alternative is designed to meet the minimum effluent requirements for BOD, TSS and TKN; however, the water quality produced by each process can vary.

STM Aerotor and extended aeration produce similar effluent quality (as they are similar treatment processes). While there are operational differences with respect to these two technologies, both can produce good effluent. Neither technology is more advantageous than the other with respect to water resources.

UV disinfection and chlorination/dechlorination will meet effluent criteria. Chlorination/dechlorination can leave residual chemicals in the WWTP effluent. UV disinfection produces high quality effluent in a smaller space without the risk of leaving residual chemicals in the effluent water.

1.3.3 Reliability

Reliability compares each alternative in terms of maintenance, repair frequency, and history/experience with the technology at other treatment plants. This criterion is important as it compares the work load and complexity of plant operation that each alternative will require.

STM Aerotor and extended aeration are fairly similar in this respect as they both use an activated sludge process. Aeration basins are simple from a maintenance stand point as diffusers only require periodic maintenance and no moving equipment is submerged in the basins. In contrast, STM Aerotor has submerged drive chains. However, STM aerotor technology is more flexible in terms of sludge management and can be less temperamental with varying influent loads. In addition, the STM Aerotor process provides for better sludge settling characteristics. All considered, both alternatives appear fairly equal with regards to these criteria although the improved settling characteristics provide for easier operations.

The existing chlorination system would require additional chlorine and sulfur dioxide cylinders for phase 1, and an additional channel with more cylinders, new injection equipment and larger building to house the equipment for phases 2 and 3. This process becomes more and more difficult to manage with each

expansion. It is further complicated by the risk management issues associated with maintaining large amounts of chlorine gas onsite. In contrast, UV disinfection provides a compact, relatively simple system to operate. Maintenance here requires only periodic lamp replacement and quartz sleeve cleaning. A UV system would be much easier and efficient to operate, especially as the WWTP capacity increases.

1.3.4 Expandability

The expandability, or ease of expanding each process for future phases, was also considered.

STM Aerotor and extended aeration require similar, proportional upgrades in that each phase builds basins similar in size to the basins provided in the first phase. However, as the STM basins are smaller, their expansion will take up less space. Thus, the STM aerotor alternative is more easily expanded as it will fit on the existing site without the removal of existing structures, unlike extended aeration basins. Therefore, in terms of expandability, the STM aerotor alternative appears to be better.

The UV disinfection alternative can be contained in the existing chlorine contact basin for all three phases, with ample room for even more growth in the future. The chlorination/dechlorination process could be contained in the existing channel for only phase 1. At that point, the existing channel will reach its design limit and would require additional channels for phases 2 and 3. The chlorination alternative would require a new building in phase 1, with room for the future equipment (canisters etc...) associated with phases 2 and 3. Thus, UV disinfection better meets these criteria.

1.3.5 Secondary Treatment Alternatives: Economic Analysis

The costs associated with each alternative were compared. Specifically, each alternative's initial capital cost as well as the 20-year life-cycle cost was calculated for comparison. The 20-year life-cycle cost is determined from the initial capital cost, costs associated with future phases and upgrades, and the annual operation and maintenance (O&M) costs over that period of time. The 20-year O&M costs are based on the plants requirements at each phase during the design life and then those costs are brought back to a present value. Future capital costs have also been estimated and brought back to present value for this evaluation. In general, the analysis uses an inflation rate of 3% and a discount rate of 5%; note that typical discount rates range from 4.5 to 6%. The following sections and tables break down the initial capital and life-cycle costs of the alternatives.

The initial capital costs for the secondary treatment alternatives are shown in Tables 5 and 6. The STM Aerotor alternative is more economical. Though the STM Aerotor equipment is significantly more expensive than fine bubble diffusers equipment, the extended aeration basins would require nearly twice the earthwork and concrete. Furthermore, the extended aeration alternative requires blower equipment, additional building space to house the blowers, and potentially acquiring more land.

Table 5: STM Aerotor capital costs.

STM Aerotor Alternative

HPUD Wastewater Treatm Plant Upgrade				Phase 1		Phase 2		Phase 3	
ITEM	DESCRIPTION	Unit	Unit Cost	Quantity	COST	Quantity	COST	Quantity	COST
1	STM Aerotor & Anoxic Basins - Concrete	cu. yd.	$ 1,000	750	$ 750,000	750	$ 750,000	750	$ 750,000
2	STM Basin Excavation	cu. yd.	$ 15	1800	$ 27,000	1800	$ 27,000	1800	$ 27,000
3	STM Basin Backfill	cu. yd.	$ 25	1600	$ 40,000	1600	$ 40,000	1600	$ 40,000
4	STM Aerotor Equipment	lump	$ 560,000	1	$ 560,000	1	$ 560,000	1	$ 560,000
5	Anoxic Mixers	each	$ 10,000	2	$ 20,000	2	$ 20,000	2	$ 20,000
6	Installation	percent		20%	$ 279,400	20%	$ 279,400	20%	$ 279,400
7	Electrical Control	percent		20%	$ 279,400	20%	$ 279,400	20%	$ 279,400
			TOTAL		$ 1,955,800		$1,955,800		$ 1,955,800

Table 6: Extended aeration capital costs.

Extended Aeration Tanks

HPUD Wastewater Treatm Plant Upgrade				Phase 1		Phase 2		Phase 3	
ITEM	DESCRIPTION	Unit	Unit Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
1	Extended Aeration Basin Concrete	cu. yd.	$ 1,000	1150	$ 1,150,000	1150	$ 1,150,000	1150	$ 1,150,000
2	Basin Excavation	cu. yd.	$ 15	3750	$ 56,250	3750	$ 56,250	3750	$ 56,250
3	Basin Backfill	cu. yd.	$ 25	3400	$ 85,000	3275	$ 81,875	3275	$ 81,875
4	Aeration Basin Diffusers	lump	$ 60,000	1	$ 60,000	1	$ 60,000	1	$ 60,000
5	Anoxic Mixers	ea	$ 10,000	2	$ 20,000	2	$ 20,000	2	$ 20,000
6	Blower Equipment (Phase 1: (2) @ 1,200 scfm)	ea	$ 50,000	2	$ 100,000	1	$ 50,000	1	$ 50,000
7	Blower Building	lump	$ 50,000	1	$ 50,000	0	$ -	0	$ -
8	Installation	percent		20%	$ 304,250	20%	$ 283,625	20%	$ 283,625
9	Electrical Control	percent		20%	$ 304,250	20%	$ 283,625	20%	$ 283,625
			TOTAL		$ 2,129,750		$ 1,985,375		$ 1,985,375

For the secondary treatment alternatives, the O&M costs were analyzed in terms of power consumption. It was assumed that cost differences in staff, management and other items would be negligible. As STM Aerotor requires significantly less power than the aeration blowers (60 hp per each dual STM basin versus 100 hp blower per each dual extended aeration basin), the O&M costs for the aerotors is significantly less. Thus, the STM Aerotor alternative is more cost effective with respect to capital costs and O&M costs (Table 7). The NPV of the O&M costs assumed that phases 2 and 3 would

be implemented 11 years and 16 years after phase 1 respectively. Refer to the appendix for more detail regarding NPV calculations.

Table 7: Secondary treatment life cycle costs summary.

HPUD Wastewater Treatment Plant Upgrade Secondary Treatment Alternatives				
ALTERNATIVES	Initial Capital Costs (Phase 1)	Phase 1 O&M Costs	20-yr Present Value O&M & Capital Costs	Present Value Life Cycle Costs
STM Aerotors	$1,955,800	$26,140	$3,644,622	$5,600,422
Extended Aeration	$2,129,750	$44,438	$4,189,042	$6,318,792

Details regarding the O&M costs, including power consumption, chemical costs and the NPV calculations are provided in the appendix. Note that the capital and O&M costs presented here reflect only the equipment and facilities directly associated with the alternative and exclude the costs of other items such as secondary clarifiers; the headworks building and equipment; the solids handling building and dewatering equipment; yard piping and valves; upgrades to existing facilities including the oxidation ditches; and general operator, maintenance and energy costs. As these costs will be very similar regardless of the selected alternative, they were excluded from this analysis to allow a more direct comparison.

1.3.6 Disinfection Alternatives Economic Analysis

Cost analysis of the disinfection alternatives show that converting the existing channel into a UV disinfection system will have a higher initial capital cost, for the phase 1 expansion, but would be the most cost effective alternative over the 20-year life cycle. Additionally, expansion of the UV process in phases 2 and 3 requires only minor upgrades and additional equipment, where as the chlorination/dechlorination alternatives would require additional channels, buildings and equipment. Thus, in terms of capital costs (Tables 8 and 9), converting to UV disinfection is more expensive for phase 1, but less expensive when adding all the capital costs together.

Table 8: UV disinfection alternative capital costs.

UV Disinfection

HPUD Wastewater Treatm Plant Upgrade				Phase 1		Phase 2		Phase 2	
ITEM	DESCRIPTION	Unit	Unit Cost	Quantity	COST	Quantity	COST	Quantity	COST
1	Retrofit Existing Channel	lump	$ 75,000	1	$ 75,000	0	$ -	0	$ -
2	Equipment Concrete Pads	lump	$ 25,000	1	$ 25,000	1	$ 25,000	1	$ 25,000
3	Initial UV Equipment	lump	$ 400,000	1	$ 400,000	0	$ -	0	$ -
4	Expand UV Equipment	lump	$ 30,000	0	$ -	1	$ 30,000	1	$ 30,000
5	Installation	percent		20%	$ 100,000	20%	$ 11,000	20%	$ 11,000
6	Electrical Control	percent		20%	$ 100,000	20%	$ 11,000	20%	$ 11,000
			TOTAL		$ 700,000		$ 77,000		$ 77,000

Table 9: Chlorination/Dechlorination alternative capital costs.

Chlorination/Dechlorination

HPUD Wastewater Treatm Plant Upgrade				Phase 1		Phase 2		Phase 3	
ITEM	DESCRIPTION	Unit	Unit Cost	Quantity	COST	Quantity	COST	Quantity	COST
1	Demolition of Existing Chlorination Building	lump	$ 15,000	1	$ 15,000	0	$ -	0	$ -
2	New Chlorination Building (w/ conrete)	lump	$ 150,000	1	$ 150,000	0	$ -	0	$ -
3	Chlorination Equipment	lump	$ 80,000	0	$ -	1	$ 80,000	0	$ -
4	New Dechlorination Building (w/ concrete)	lump	$ 150,000	1	$ 150,000	0	$ -	0	$ -
5	Dechlorination Equipment	lump	$ 75,000	0	$ -	1	$ 75,000	0	$ -
6									
7	New Chlorine Channel - Concrete	cu. yd.	$ 1,000	0	$ -	250	$ 250,000	0	$ -
8	New Chlorine Channel - Excavation	cu. yd.	$ 15	0	$ -	600	$ 9,000	0	$ -
9	New Chlorine Channel - Backfill	cu. yd.	$ 25	0	$ -	500	$ 12,500	0	$ -
12	Installation	percent		20%	$ 63,000	20%	$ 85,300	20%	$ -
13	Electrical Control	percent		20%	$ 63,000	20%	$ 85,300	20%	$ -
			TOTAL		$ 441,000		$ 597,100		$ -

The O&M costs of these two alternatives were also analyzed. Though the UV system has higher energy costs, the chemical costs associated with the chlorine gas and sulfur dioxide gas cylinders are much greater. Therefore, the life cycle present value costs (Table 10) of the disinfection alternatives show that the UV alternative is more cost effective in terms of overall life cycle costs.

Table 10: Disinfection life cycle cost summary.

HPUD Wastewater Treatment Plant Upgrade Disinfection Alternatives				
ALTERNATIVES	**Initial Capital Costs (Phase 1)**	**Phase 1 O&M Costs**	**20-yr Present Value O&M Cost**	**Present Value Life Cycle Costs**
UV Disinfection	**$700,000**	**$26,282**	**$563,561**	**$1,263,561**
Chlorination/Dechlorination	**$441,000**	**$36,491**	**$1,266,577**	**$1,707,577**

1.4 ALTERNATIVE SELECTION AND RECOMMENDATION

The previous section summarizes the economic and non-economic criteria for the secondary treatment and disinfection alternatives. Based on the information provided and discussed in section 1.3, each alternative has been compared with the other in order to select the best alternative for this upgrade. Table 11 summarizes the analysis by ranking each alternative with respect to the design criteria. Each criterion is given a weighted value (1 – 5) based on its relative importance to the overall project, 1 being less important and 5 being very important. Each alternative is then scored based on how well it meets each criterion; lower scores correlate with an alternative not meeting the criterion as well as the other alternative (i.e. 1 is less desirable and 2 is more desirable). Finally, the scores for each alternative are summed to rank each alternative and determine/justify the alternative selected.

Table 11: Economic and non-economic criteria.

Type of Impact	Weight Value	Secondary Treatment Alternatives				Disinfection Alternatives			
		STM Aerotors		Extended Aeration		UV Disinfection		Chlorination	
		Score	Total	Score	Total	Score	Total	Score	Total
Environmental	2	2	4	1	2	2	4	2	4
Water Resources	2	2	4	2	4	2	4	2	4
Reliability	3	2	6	1	3	2	6	1	3
Expandability	1	2	2	2	2	2	2	1	1
Initial Capital Costs	5	2	10	1	5	1	5	2	10
O&M Costs	4	2	8	1	4	2	8	1	4
TOTALS			**34**		**20**		**29**		**26**

Legend:

Weight Value
1 - Minimum Importance
5 - Very Important

Score
1 - Least Desireable of the Alternatives
2 - Most Desireable of the Alternatives

The results shown in Table 11 conclude that the STM Aerotor alternative is the better choice for secondary treatment. This alternative is more economical, more efficient, and will have less impact on the environment. The UV disinfection alternative was shown to be the best alternative for disinfection at the HPUD WWTP as it is more reliable, easier to expand, and has the lowest life cycle cost.

At this time, it is recommended that the WWTP for the HPUD upgrade by incorporating STM aerotors as a secondary treatment process and by converting the existing chlorine contact basin into a UV disinfection channel. These alternatives will prove the most economical in terms of capital costs and

O&M costs. In addition, they will improve the efficiency and quality of effluent discharged from the WWTP. It is anticipated that these 3 phases will provide adequate capacity for the next 20 years.

1.5 APPENDIX

This first series of charts show the power consumption and cost analyses of the alternatives. The future power costs (for phases 2 and 3) were calculated assuming an annual inflation rate of 3% on the current price of 8 cents per kWh. This inflation rate was used to keep the NPV calculations for the life cycle costs consistent (i.e. inflation of 3%).

STM Aerotors											
			Phase 1			Phase 2			Phase 3		
Description	Connected Power (HP)	Actual Power Draw (HP)	Quantity	Run Time	Power Costs @ $0.08/kWh	Quantity	Run Time	Power Costs @ $0.11/kWh	Quantity	Run Time	Power Costs @ $0.13/kWh
STM Aerotors	10	7.5	6	100%	$23,526	12	100%	$64,696	18	100%	$114,689
Anoxic Mixers	3	2.5	2	100%	$2,614	4	100%	$7,188	6	100%	$12,743
TOTAL					$26,140			$71,885			$127,432

Extended Aeration											
			Phase 1			Phase 2			Phase 3		
Description	Connected Power (HP)	Actual Power Draw (HP)	Quantity	Run Time	Power Costs @ $0.08/kWh	Quantity	Run Time	Power Costs @ $0.11/kWh	Quantity	Run Time	Power Costs @ $0.13/kWh
Blowers (1,200 scfm)	100	85	2	50%	$44,438	3	67%	$122,815	4	75%	$216,634
TOTAL					$44,438			$122,815			$216,634

Chlorination/Dechlorination											
			Phase 1			Phase 2			Phase 3		
Description	Connected Power (HP)	Actual Power Draw (HP)	Quantity	Run Time	Power Costs @ $0.08/kWh	Quantity	Run Time	Power Costs @ $0.11/kWh	Quantity	Run Time	Power Costs @ $0.13/kWh
Chlorination Equipment	2	1	2	100%	$1,046	4	100%	$2,875	6	100%	$5,097
TOTAL					$1,046			$2,875			$5,097

UV Disinfection Power Consuption					
	Phase 1				
Description	Lamps per Bank	Banks per Channel	Total Connected Power (kW)	Run Time	Power Costs @ $0.08/kWh
UV Modules	24	2	24	25%	$5,782
	Phase 2				
Description	Lamps per Bank	Banks per Channel	Total Connected Power (kW)	Run Time	Power Costs @ $0.11/kWh
UV Modules	24	2.00	24	50%	$11,563
	Phase 3				
Description	Lamps per Bank	Banks per Channel	Total Connected Power (kW)	Run Time	Power Costs @ $0.13/kWh
UV Modules	30	2	30	50%	$17,082

OPERATION AND MAINTENANCE ANNUAL ESTIMATES - Phase 1

Category	Description	UV Disinfection	Chlorination	UV Disinfection	Chlorination	UV Disinfection	Chlorination
		PHASE 1		PHASE 2		PHASE 3	
UTILITIES	Utilities	$5,782	$1,046	$11,563	$2,875	$17,082	$5,097
	Subtotal	**$5,782**	**$1,046**	**$11,563**	**$2,875**	**$17,082**	**$5,097**
MATERIALS	Chemical expense	$15,000	$32,945	$20,150	$73,793	$23,400	$105,736
	Equipment Replacement	$5,500	$2,500	$7,392	$3,360	$8,569	$3,900
	Subtotal	**$20,500**	**$35,445**	**$27,542**	**$77,153**	**$31,969**	**$109,636**
	TOTAL Annual O&M COSTS	**$26,282**	**$36,491**	**$39,105**	**$80,029**	**$49,051**	**$114,733**

These next tables break down the annual O&M costs for each alternative. The O&M column represents a 3% inflation rate on the original estimated O&M costs. The PV column then shows the present value, discounted (5% discount rate for this analysis) cost. Since the O&M costs for STM aerotors and extended aeration were based on power consumption only, a separate O&M cost breakdown is not shown.

SECONDARY TREATMENT O&M and Future Capital Costs (Phases 2 & 3)

	STM Aerotor O&M PV				Aeration O&M PV				
year	O&M	PV	Future Cap. Cost	NPV Capital Cost	O&M	PV	Future Cap. Cost	NPV Capital Cost	
1	$26,140	$24,895	$ 1,955,800	$ 1,862,667	$44,438	$42,322	$1,985,375	$1,890,833	
2	$26,924	$24,421	$ 2,014,474	$ 1,827,187	$45,771	$41,516	$2,044,936	$1,854,817	
3	$27,732	$23,956	$ 2,074,908	$ 1,792,384	$47,144	$40,725	$2,106,284	$1,819,488	
4	$28,564	$23,499	$ 2,137,155	$ 1,758,243	$48,558	$39,949	$2,169,473	$1,784,831	
5	$29,421	$23,052	$ 2,201,270	$ 1,724,753	$50,015	$39,188	$2,234,557	$1,750,834	
6	$30,303	$22,613	$ 2,267,308	$ 1,691,900	$51,516	$38,442	$2,301,594	$1,717,485	
7	$31,212	$22,182	$ 2,335,327	$ 1,659,674	$53,061	$37,709	$2,370,642	$1,684,771	
8	$32,149	$21,760	$ 2,405,387	$ 1,628,061	$54,653	$36,991	$2,441,761	$1,652,680	
9	$33,113	$21,345	$ 2,477,549	$ 1,597,050	$56,292	$36,287	$2,515,014	$1,621,200	
10	$34,107	$20,938	$ 2,551,875	$ 1,566,630	$57,981	$35,595	$2,590,464	$1,590,320	
11	**$71,885**	**$42,029**	$ 2,628,432	**$ 1,536,790**	**$122,815**	**$71,807**	**$2,668,178**	**$1,560,028**	**Start Phase**
12	$74,041	$41,229	$ 2,707,285	$ 1,507,517	$126,499	$70,439	$2,748,223	$1,530,314	
13	$76,262	$40,444	$ 2,788,503	$ 1,478,803	$130,294	$69,098	$2,830,670	$1,501,165	
14	$78,550	$39,673	$ 2,872,158	$ 1,450,635	$134,203	$67,782	$2,915,590	$1,472,571	
15	$80,907	$38,918	$ 2,958,323	$ 1,423,004	$138,229	$66,491	$3,003,058	$1,444,522	
16	**$127,432**	**$58,378**	$ 3,047,073	**$ 1,395,899**	**$216,634**	**$99,242**	**$3,093,150**	**$1,417,007**	**Start Phase**
17	$131,255	$57,266	$ 3,138,485	$ 1,369,311	$223,133	$97,352	$3,185,944	$1,390,017	
18	$135,192	$56,175	$ 3,232,639	$ 1,343,228	$229,827	$95,498	$3,281,522	$1,363,540	
19	$139,248	$55,105	$ 3,329,619	$ 1,317,643	$236,722	$93,679	$3,379,968	$1,337,568	
20	$143,426	$54,056	$ 3,429,507	$ 1,292,545	$243,823	$91,894	$3,481,367	$1,312,091	
			Phase 2 & 3				Phase 2 & 3		
		$711,933	NPV	$ 2,932,689		$1,212,006	NPV	$ 2,977,036	

DISINFECTION O&M and Future Capital Costs (Phases 2 & 3)

	UV O&M PV				Chlorination				
year	O&M	PV	Future Cap. Cost	NPV Capital Cost	O&M	PV	Future Cap. Cost	NPV Capital Cost	
1	$26,282	$25,030	$ 77,000	$ 73,333	$36,491	$34,753	$ 597,100	$ 568,667	
2	$27,070	$24,553	$ 79,310	$ 71,937	$37,586	$34,091	$ 615,013	$ 557,835	
3	$27,882	$24,086	$ 81,689	$ 70,566	$38,713	$33,442	$ 633,463	$ 547,209	
4	$28,719	$23,627	$ 84,140	$ 69,222	$39,875	$32,805	$ 652,467	$ 536,786	
5	$29,580	$23,177	$ 86,664	$ 67,904	$41,071	$32,180	$ 672,041	$ 526,562	
6	$30,468	$22,735	$ 89,264	$ 66,610	$42,303	$31,567	$ 692,203	$ 516,532	
7	$31,382	$22,302	$ 91,942	$ 65,341	$43,572	$30,966	$ 712,969	$ 506,693	
8	$32,323	$21,878	$ 94,700	$ 64,097	$44,879	$30,376	$ 734,358	$ 497,042	
9	$33,293	$21,461	$ 97,541	$ 62,876	$46,226	$29,798	$ 756,388	$ 487,575	
10	$34,292	$21,052	$ 100,468	$ 61,678	$47,613	$29,230	$ 779,080	$ 478,288	
11	**$39,105**	**$22,864**	**$ 103,482**	**$ 60,504**	**$80,029**	**$46,791**	**$ 802,452**	**$ 469,177**	**Phase 2**
12	$40,278	$22,428	$ 106,586	$ 59,351	$82,429	$45,900	$ -	$ -	
13	$41,486	$22,001	$ 109,784	$ 58,221	$84,902	$45,026	$ -	$ -	
14	$42,731	$21,582	$ 113,077	$ 57,112	$87,449	$44,168	$ -	$ -	
15	$44,013	$21,171	$ 116,469	$ 56,024	$90,073	$43,327	$ -	$ -	
16	**$49,051**	**$22,471**	**$ 119,963**	**$ 54,957**	**$114,733**	**$52,560**	**$ -**	**$ -**	**Phase 3**
17	$50,522	$22,043	$ 123,562	$ 53,910	$118,175	$51,559	$ -	$ -	
18	$52,038	$21,623	$ 127,269	$ 52,883	$121,720	$50,577	$ -	$ -	
19	$53,599	$21,211	$ 131,087	$ 51,876	$125,372	$49,614	$ -	$ -	
20	$55,207	$20,807	$ 135,020	$ 50,888	$129,133	$48,669	$ -	$ -	
			Phase 2 & 3				Phase 2 & 3		
		$448,101	NPV	$ 115,460		$797,399	NPV	$ 469,177	

DATA FROM TREATMENT PLANT			
Current Cost (for avg. flow of 0.55 MGD) **$15,100 Chemical Cost/year**			
YEAR	PHASE	ANNUAL COST	NPV
1	Phase 1	$32,945	$ 31,377
2	Phase 1	$33,934	$ 30,779
3	Phase 1	$34,952	$ 30,193
4	Phase 1	$36,000	$ 29,618
5	Phase 1	$37,080	$ 29,053
6	Phase 1	$38,193	$ 28,500
7	Phase 1	$39,339	$ 27,957
8	Phase 1	$40,519	$ 27,425
9	Phase 1	$41,734	$ 26,902
10	Phase 1	$42,986	$ 26,390
11	**Phase 2**	**$73,793**	**$ 43,145**
12	Phase 2	$76,007	$ 42,324
13	Phase 2	$78,287	$ 41,517
14	Phase 2	$80,636	$ 40,727
15	Phase 2	$83,055	$ 39,951
16	Phase 2	$85,547	$ 39,190
17	**Phase 3**	**$105,736**	**$ 46,132**
18	Phase 3	$108,908	$ 45,253
19	Phase 3	$112,175	$ 44,391
20	Phase 3	$115,540	$ 43,546