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City of Oxnard

Public Works Integrated Master Plan

WASTEWATER

PROJECT MEMORANDUM 3.2
FLOW AND LOAD PROJECTIONS

FINAL DRAFT
December 2015

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City of Oxnard

Public Works Integrated Master Plan

WASTEWATER

PROJECT MEMORANDUM 3.2
FLOW AND LOAD PROJECTIONS

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WASTEWATER FLOW AND LOAD PROJECTIONS

1.0 INTRODUCTION

This Project Memorandum (PM) summarizes the City's existing and projected future wastewater flows and pollution loads. Historical trends in flows and loads by discharger type were summarized and noted. These historical trends were then used to inform the forecasting methodology for future wastewater flow and load projections through the planning period for the Public Works Integrated Master Plan (PWIMP) of 2040.

Since this analysis was conducted, the level sensor measuring influent flow was adjusted in the first quarter of 2015. This adjustment indicated that past flows may have been over reported. Given that, this analysis as well as the performance and capacity analysis performed in PM 3.4, *Wastewater - Treatment Plant Performance and Capacity* are conservative.

1.1 Project Memorandums (PMs) Used for Reference

The wastewater flow and load projections outlined in this PM are made in concert with recommendations and analyses from other related PMs:

- PM 1.3 – Overall - Population and Land Use Estimates.
- PM 2.2 - Water System - Water Demand Projections.
- PM 3.1 - Wastewater System - Background Summary.

1.2 Other Reports Used for Reference

In developing the wastewater flow and load projections in this PWIMP, the following reports were used:

- City of Oxnard 2030 General Plan, Development Services Department Planning Division, October 2011 (City of Oxnard General Plan, 2011).
- Wastewater Engineering Treatment and Resource Recovery, Fifth Edition, (Metcalf and Eddy, 2014).
- 2010 United States Census, (U.S. Census Bureau, 2010).
- 2010 Census Traffic Analysis Zone (TAZ), U.S. Department of Commerce, U.S. Census Bureau, Geography Division, (TAZ, 2010).

- Oxnard Industrial Discharge Permits, City of Oxnard, (Industrial Discharge Permits, 2014).

2.0 PROJECTED POPULATION

The Oxnard Wastewater Treatment Plant (OWTP) treats wastewater from the City of Oxnard, the City of Port Hueneme, and a number of significant industrial users. Both the City of Oxnard and the City of Port Hueneme flows were projected in conjunction with their population projections. All other entities contributing wastewater to the OWTP were projected separately and discussed in Section 3.2, 3.3, and 3.4 below. Population projections from the 2030 Oxnard General Plan were used for projecting the City of Oxnard population. As discussed in PM 1.3, *Overall – Population and Land Use Estimates,* the 2030 General Plan outlines four different population projections for the City. The low 2030 General Plan population projections were used for this analysis. Detailed discussion behind this decision can be found in PM 1.3, *Overall - Population and Land Use Estimates.* These population projections are consistent with population projections used for water demand forecasting outlined in PM 2.2, *Water System – Water Demand Projections*.

In addition, the Oxnard Wastewater Treatment Plant (OWTP) treats wastewater from the City of Port Hueneme. US Census data in 2010 for the City of Port Hueneme indicated a population of 21,723 (U.S. Census Bureau, 2010). This is a 0.56 percent decrease in population from their 2000 US Census population. As a conservative estimate, it was assumed that Port Hueneme population would remain constant over the planning period.

3.0 HISTORICAL WASTEWATER FLOWS AND LOADS

Historic influent wastewater flows and loads were analyzed for 2009 through 2013 and are shown in Tables 1 and 2 as well as Figures 1, 2, 3 and 4. These influent flows and loads include residential and commercial users, industrial dischargers, as well as desalter concentrate. Each of these three components are discussed separately in the sections that follow.

Table 1 Historical Wastewater Flows to OWTP (in mgd)
Public Works Integrated Master Plan
City of Oxnard

Flow Condition	Historical Data					
	2009	2010	2011	2012	2013	2009-2013 Average
Average Dry Weather Flow[(1)]	21.7	21.4	20.1	19.9	19.5	20.5
Average Annual[(2)]	22.4	22.2	21.6	20.5	19.7	21.3
Average Day Maximum Month[(3)]	24.2	24.1	24.3	21.4	20.3	22.9

Table 1 Historical Wastewater Flows to OWTP (in mgd)
Public Works Integrated Master Plan
City of Oxnard

Flow Condition	Historical Data					
	2009	2010	2011	2012	2013	2009-2013 Average
Maximum Week[4]	24.6	26.9	26.0	21.9	20.7	24.0
Maximum Day[5]	26.9	30.5	31.6	25.5	23.5	27.6

Notes:
(1) Average Dry Weather (ADW) Flow = Lowest 90 day running average flow.
(2) Average Annual (AA) = Average for a 365 consecutive day period.
(3) Average Day Maximum Month (ADMM) = Highest 28 day running average flow.
(4) Maximum Week (MW) = Highest 7 day running average flow.
(5) Maximum Day (MD) = Highest observed daily flow.

Table 2 Historical Wastewater Loads to OWTP
Public Works Integrated Master Plan
City of Oxnard

Flow Condition	Historical Data					
	2009	2010	2011	2012	2013	2009-2013 Average
BOD5[1]						
ADW, klb/d[2]	53.3	50.5	45.1	45.8	48.8	48.7
ADW, mg/L[3]	295	283	269	276	299	284
AA, klb/d	61.4	53.7	49.7	53.1	52.5	54.1
MM, klb/d	67.9	59.1	56.3	59.7	61.4	61.3
MW, klb/d	85.3	64.7	59.4	62.7	66.9	67.8
MD, klb/d	108	88.2	94.2	76.6	92.5	91.9
TSS						
ADW, klb/d	46.4	44.4	41.6	41.5	45.1	43.8
ADW, mg/L	257	249	248	250	277	256
AA, klb/d	49.5	49.2	48.7	46.0	47.8	48.2
ADMM, klb/d	60.5	59.5	65.5	53.1	56.5	59.0
MW, klb/d	89.8	76.5	81.8	64.5	70.7	76.7
MD, klb/d	142	211	190	104	173	164
NH3-N						
ADW, klb/d	6.53	6.26	5.97	6.22	6.30	6.26
ADW, mg/L	36.1	35.1	35.6	37.5	38.7	36.6
AA, klb/d	6.85	6.51	6.63	6.80	6.47	6.65
ADMM, klb/d	7.88	7.51	7.64	7.99	6.83	7.57
MW, klb/d	9.63	8.33	8.24	10.2	7.77	8.83

Table 2 Historical Wastewater Loads to OWTP Public Works Integrated Master Plan City of Oxnard						
	Historical Data					
Flow Condition	2009	2010	2011	2012	2013	2009-2013 Average
MD, klb/d	9.63	8.33	8.24	10.2	7.77	8.83

Notes:
(1) These higher BOD values are likely due to high soluble BOD from the canning and food processing industry.
(2) ADW = Influent load during ADW flow period.
(3) ADW, mg/L calculated as ADW Load (lb/d) / ADWF (mgd) / 8.34.

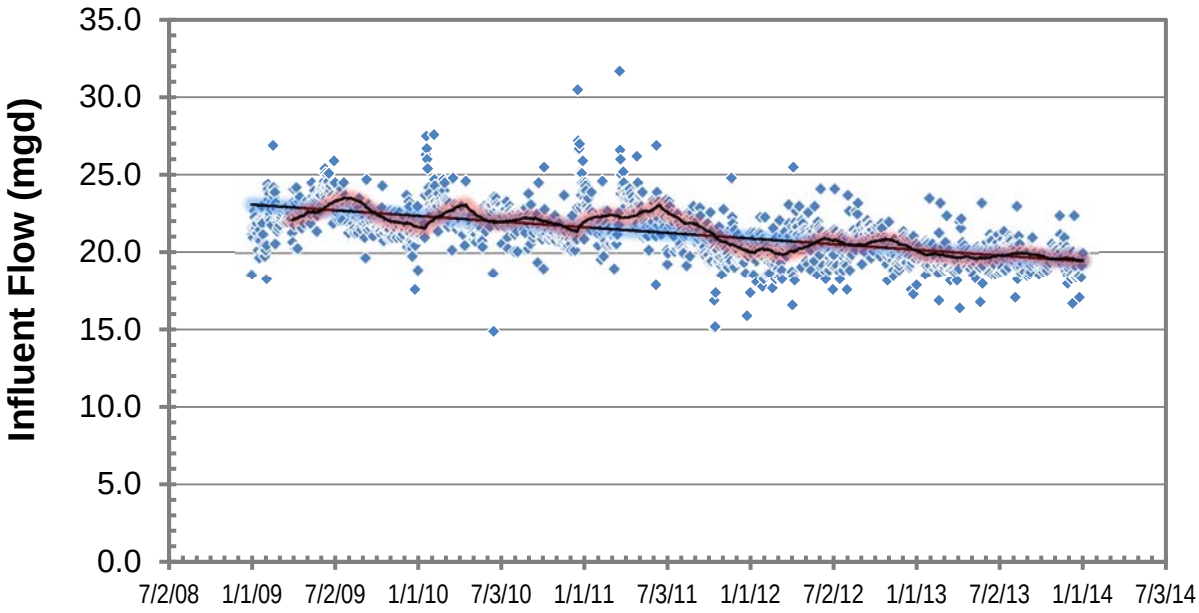

Figure 1 Historical Influent Flow

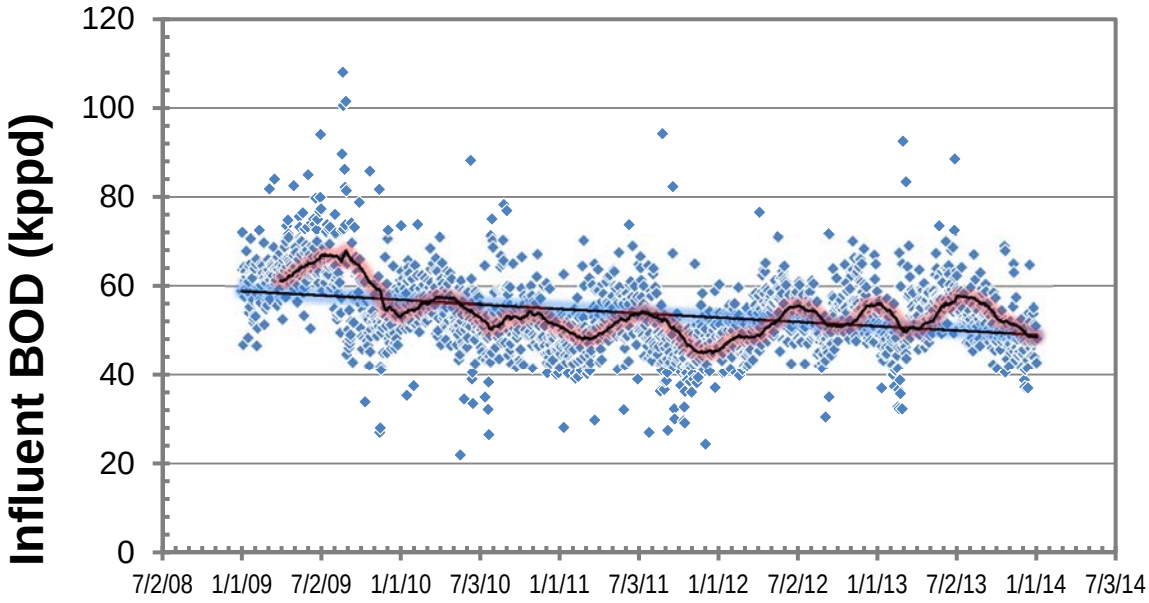

Figure 2 Historical Influent BOD Load

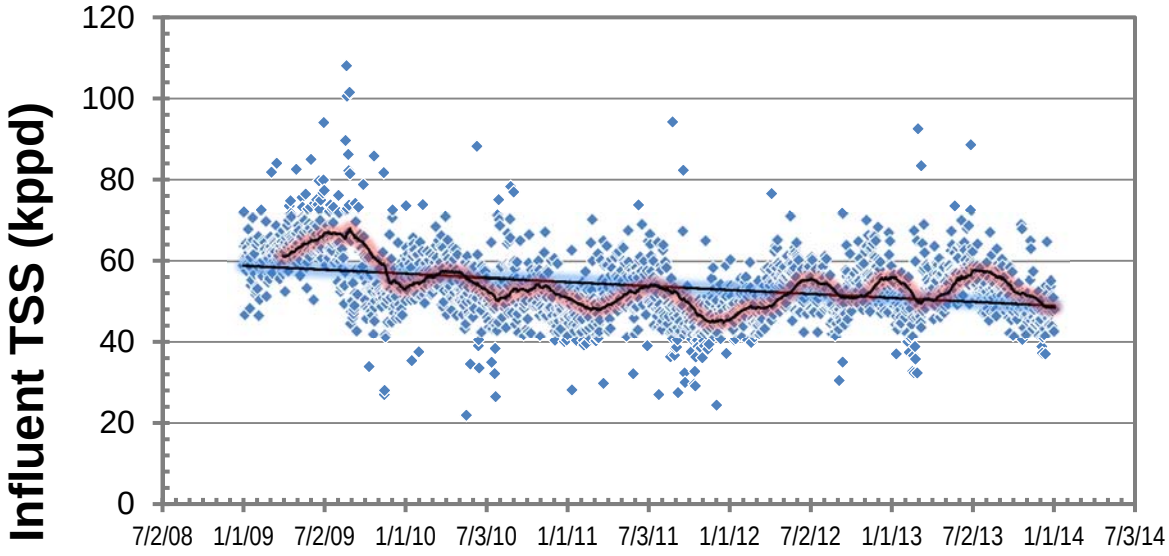

Figure 3 Historical Influent TSS Load

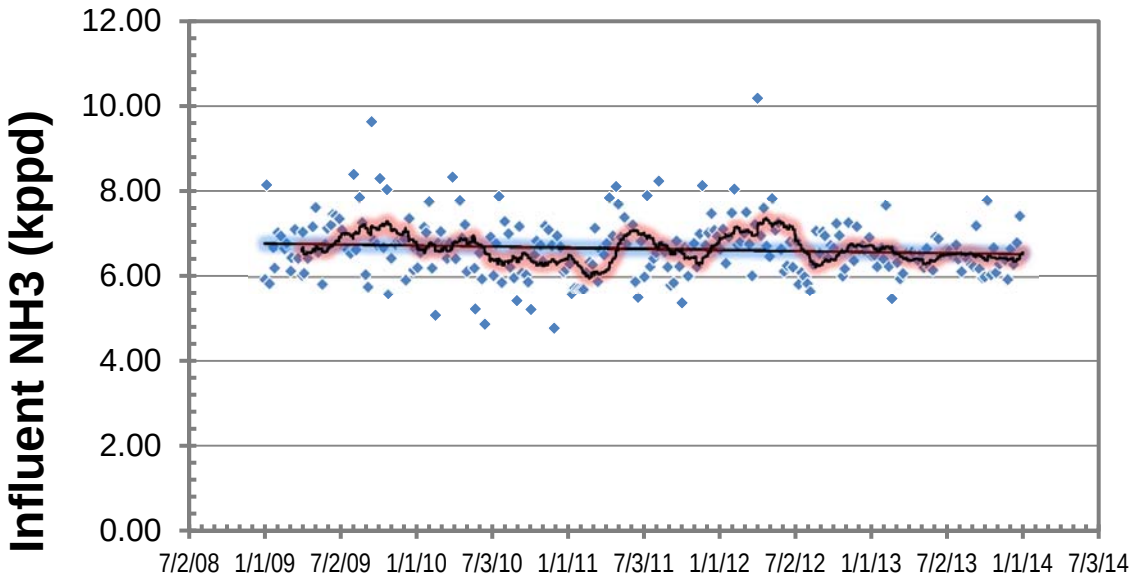

Figure 4 Historical Influent NH3 Load

3.1 Per Capita Flows and Loads (Residential & Commercial)

The majority of flows and BOD and TSS loads entering the OWTP come from residential and commercial dischargers. These commercial and residential discharges are not measured directly and instead must be calculated as the remainder of flow and loads once industrial and desalter concentrate flows and loads are subtracted off using a headworks flow and mass balance approach.

It is typical for these residential and commercial flows and loads to be represented on a per capita basis. For the OWTP, per capita flows and per capita BOD and TSS loads were calculated using 2010 data, which was the most recent US Census data. The 2010 US Census population data for Oxnard and for Port Hueneme as well as recorded 2010 plant influent flows and BOD and TSS loads were used in this analysis. The results are summarized in Table 3. The resulting per capita flows and per capita BOD and TSS loads are within the range given for typical domestic and commercial per capita value (Metcalf and Eddy, 2014).

Table 3 2010 Per Capita Flows and Loads
Public Works Integrated Master Plan
City of Oxnard

	2010		
	Flow (mgd)	**BOD (ppd)**	**TSS (ppd)**
Total OWTP Influent(1)	21.4	50,481	44,428
Industrial(2)	5.2	6070	5431
Desalter Concentrate(2)	1.8	0	63

Table 3 2010 Per Capita Flows and Loads
Public Works Integrated Master Plan
City of Oxnard

	2010		
	Flow (mgd)	**BOD (ppd)**	**TSS (ppd)**
Residential/Commercial(3)	14.4	44,911	38,935
Per Capita(4)	64 gpd/capita	0.20 ppd/capita	0.17 ppd/capita
Typical Per Capita(5)	40-130 gpd/capita	0.11-0.26 ppd/capita	0.13-0.33 ppd/capita

Notes:
(1) 2010 recorded plant influent flow and loads.
(2) 2010 flows and loads were assumed to be the same as 2014 flows and loads. This flow includes Naval base flow.
(3) Residential and commercial flows and loads were back calculated by subtracting desalter concentrate and industry from total OWTP influent.
(4) Per capita was calculated by dividing residential and commercial by the adjusted 2010 US Census population data for Oxnard and the 2010 US Census population data for Port Hueneme (Total Population: 223,222). Oxnard population data was adjusted to correct for a discrepancy in defined city boundary.
(5) (Metcalf and Eddy, 2014).

Per capita flows were also calculated through Oxnard's collection system model. Dry weather flow monitoring was used to calibrate this model. In the calibration process residential per capita flows were estimated for each subcatchment basin. These estimated per capita flows were multiplied by the population for each subcatchment to determine overall residential flow. Commercial wastewater flows were estimated via water consumption data. As a conservative estimate, it was assumed that the wastewater generation coefficient for these commercial water demands was 1.0. An overall residential and commercial per capita flow was then calculated by taking the overall calibrated wastewater flow from both residential and commercial and dividing it by the overall Oxnard population. The results of this analysis of combined residential and commercial (domestic) per capitas are summarized in Table 4.

As a conservative estimate, the larger per capita flow of 71.6 gpd/capita, as noted in Table 4, was used for domestic (residential and commercial) flow projections at the OWTP.

Table 4 Estimated Domestic Per Capita Flows Based on Collection System Model
Public Works Integrated Master Plan
City of Oxnard

	Population(1)	**GPCD**	**Flow (gpd)**
Residential - Meter Basin 1	25,526	65	1,659,190
Residential - Meter Basin 2	12,418	90	1,117,620
Residential - Meter Basin 3	28,188	90	2,536,920
Residential - Meter Basin 4	28,355	80	2,268,400

Table 4 Estimated Domestic Per Capita Flows Based on Collection System Model Public Works Integrated Master Plan City of Oxnard			
	Population[(1)]	**GPCD**	**Flow (gpd)**
Residential - Meter Basin 5	782	90	70,380
Residential - Meter Basin 6	16,309	50	815,450
Residential - Meter Basin 7	11,415	70	799,050
Residential - Meter Basin 8	28,494	50	1,424,700
Residential - Meter Basin 9	17,711	75	1,328,325
Residential - Meter Basin 10	24,981	70	1,748,670
Commercial	--	--	2,205,399
Total:	194,179	--	15,974,104
		Per Capita:	71.6 gpd/capita

Note:
(1) These populations are based on Traffic Analysis Zone (TAZ) 2010 numbers (TAZ, 2010).

3.2 Industrial Flows and Loads

In Oxnard, there are 38 Significant Industrial Users (SIUs) (Industrial Discharge Permits, 2014). Many of these SIUs are food-processing facilities, with functions such as packaging and washing of fresh vegetables. There are also a large number of metals finishing and paper processing plants. In addition, there are two Ventura County Naval Bases: Point Mugu and Port Hueneme. Since these two Ventura County Naval Base SIUs primarily discharge domestic waste, for this analysis they have been broken out separately and are discussed in Section 3.3 below. The remaining 36 SIUs are discussed below.

The largest industrial discharger is the Proctor and Gamble paper processing plant, which discharges on average 31 percent of flow, 21 percent of BOD load, and 46 percent of TSS load contributed by all 36 of the industrial dischargers. Combined, in 2013 all 36 SIUs discharged on average 4.5 mgd of wastewater, 6,070 ppd of BOD, and 5,400 ppd of TSS to the OWTP. Table 5 summarizes these flows and loadings.

Table 5 also summarizes each SIU's permitted flow capacity. The majority of these SIUs are discharging at or above their permitted capacity. There are six SIUs that discharged less than their permitted capacity in 2013. If these six SIUs discharged at their permitted capacity, the additional flow discharged would be 0.08 mgd.

Table 5 2013 Industrial Flows and Loads to Discharged OWTP
Public Works Integrated Master Plan
City of Oxnard

Industry Name	ADF[1] Permit Limit (gpd)	2013 ADF (gpd)	2013 Avg BOD (ppd)	2013 Avg TSS (ppd)
Metals				
Alliance Finishing & Manufacturing	No flow at this time	--[2]	--[3]	--[3]
Aluminum Precision Products	7,475	7,000	N/A	1
Arcturus Manufacturing	24,141	25,000	N/A	NA
Coastal Metal Finishing/Limons Metal Finishing	4,000	1,000	N/A	N/A
Elite Metal Finishing	13,500	14,000	N/A	N/A
Raypak	10,850	11,000	N/A	N/A
Simba Cal	750	750	N/A	N/A
Paper				
New Indy	309,000	300,000	70	65
Proctor and Gamble	1,376,291	1,400,000	1,300	2,500
Food Processing				
Boskovich Farms	250,000	250,000	759	367
Cal Sun Produce	32,152	32,000	46	36
Coastal Green Vegetable Co.	220,000	220,000	402	550
Duda Farm Fresh Foods	37,000	37,000	156	48
Frozsun Foods	350,000	350,000	1,083	347
Gill's Onions	250,000	250,000	386	111
Herzog Wine Cellars	10,250	10,000	182	16
J.M. Smucker Co.	148,000	148,000	172	276
Oxnard Lemon Co.	34,500	35,000	--[3]	--[3]
Pacific Ridge Farms	30,000	30,000	140	81
Saticoy Lemon #4	50,000	50,000	55	89
Scarborough Farms	17,000	17,000	4	61
Seaboard Produce Distributors	6,000	25,000	--[3]	--[3]
Terminal Freezer (Del Mar, Suncoast, Tree Top)	730,000	730,000	511	621
Ventura Pacific Co.	70,000	70,000	238	51
Other				
Automotive Racing Products	4,500 – 5,000 per disposal event	--[4]	--[4]	--[4]
Consolidated Precision Products	30,000	11,907	--[3]	--[3]
Crestview Municipal Water Co.	No flow at this time	--[2]	--[3]	--[3]
Deardorff Family Farms	10,000	10,000	3	4
EF Oxnard	15,000	15,000	N/A	N/A

Table 5 2013 Industrial Flows and Loads to Discharged OWTP
Public Works Integrated Master Plan
City of Oxnard

Industry Name	ADF[(1)] Permit Limit (gpd)	2013 ADF (gpd)	2013 Avg BOD (ppd)	2013 Avg TSS (ppd)
Harris Water Conditioning	138,000	138,000	2	22
Mission Linen Supply	39,000	39,000	71	44
Parker Hannifin	26,000	26,000	216	2
Puretec Industrial Water	100,000	100,000	12	36
Santa Clara Waste Water Co.	200,000	150,000	231	33
Schlumberger Technology	--[(5)]	--[(5)]	--[(5)]	--[(5)]
Seminis	18,650	19,000	25	72
Total	**4,600,000**	**4,500,000**	**6,070**	**5,400**

Notes:
(1) ADF = Average Day Flow.
(2) No flow reported for 2013.
(3) No BOD or TSS concentration reported for 2013.
(4) Batch discharger.
(5) Schlumberger has a dewatering (Groundwater) permit.

3.3 Naval Base Ventura County (NBVC) Flows and Loads

There are two naval bases that contribute flows and loads to the OWTP. These naval bases are NBVC at Point Mugu and NBVC at Port Hueneme. In 2013, these two facilities discharged 0.36 mgd of flow. While loadings for these two facilities were not recorded, NBVC at Point Mugu and NBVC at Port Hueneme discharge mainly domestic wastewater. Thus, for the purposes of this analysis, it was assumed that their BOD and TSS concentrations were comparable to the observed overall BOD and TSS concentrations from domestic wastewater within the City of Oxnard. In 2013, NBVC at Point Mugu and NBVC at Port Hueneme discharged substantially less flow their permitted capacity. If these facilities discharged at their permitted capacity, combined they would discharge an additional 0.36 mgd.

3.4 Desalter Concentrate Flows and Loads

In addition to industrial and residential/commercial dischargers, there are also two desalters that discharge their desalter concentrate to the OWTP. These desalters are the City of Oxnard Desalter and the Port Hueneme Water Agency Desalter. In 2013, these two desalter concentrate flows averaged 1.85 mgd. While these two dischargers are classified as SIUs, they have been separated out in this report because, unlike industry, desalter concentrate generally does not contribute substantially to BOD and TSS loadings. Because of these low loadings, these two desalter concentrate dischargers will not have a large impact on the capacity rating of the plant.

4.0 PEAKING FACTORS

Historical peaking factors were also determined for combined influent flows and loadings. Table 6 outlines historical peaking factors for 2009 to 2013 flows. Table 7 outlines historical peaking factors for 2009 to 2013 BOD and TSS loads. The 2009-2013 average peaking factors were used for projecting flows and loads.

Table 6 Historical OWTP Flow Peaking Factors
Public Works Integrated Master Plan
City of Oxnard

	Historical Peaking Factors					
Flow Condition	**2009**	**2010**	**2011**	**2012**	**2013**	**2009-2013 Average**
Average Dry Weather Flow	1.0	1.0	1.0	1.0	1.0	1.0
Average Annual	1.03	1.04	1.08	1.03	1.01	1.04
Maximum Month	1.12	1.13	1.21	1.07	1.04	1.11
Maximum Week	1.14	1.26	1.29	1.10	1.06	1.17
Maximum Day	1.24	1.43	1.58	1.28	1.20	1.35

Table 7 Historical OWTP Load Peaking Factors
Public Works Integrated Master Plan
City of Oxnard

	Historical Peaking Factors					
Load Condition	**2009**	**2010**	**2011**	**2012**	**2013**	**2009-2013 Average**
BOD_5						
Average Dry Weather Load	1.0	1.0	1.0	1.0	1.0	1.0
Average Annual	1.15	1.06	1.10	1.16	1.08	1.11
Maximum Month	1.31	1.17	1.25	1.31	1.26	1.26
Maximum Week	1.60	1.28	1.32	1.37	1.37	1.39
Maximum Day	2.03	1.75	2.09	1.67	1.90	1.89
TSS						
Average Dry Weather Load	1.0	1.0	1.0	1.0	1.0	1.0
Average Annual	1.07	1.11	1.17	1.11	1.06	1.10
Maximum Month	1.30	1.34	1.58	1.28	1.25	1.35
Maximum Week	1.94	1.72	1.97	1.55	1.57	1.75
Maximum Day	3.05	4.75	4.58	2.50	3.84	3.74
NH_3-N						
Average Dry Weather Load	1.0	1.0	1.0	1.0	1.0	1.0
Average Annual	1.05	1.04	1.11	1.09	1.03	1.06
Maximum Month	1.21	1.20	1.28	1.28	1.08	1.21

Table 7 Historical OWTP Load Peaking Factors Public Works Integrated Master Plan City of Oxnard						
	Historical Peaking Factors					
Load Condition	2009	2010	2011	2012	2013	2009-2013 Average
BOD_5						
Average Dry Weather Load	1.0	1.0	1.0	1.0	1.0	1.0
Average Annual	1.15	1.06	1.10	1.16	1.08	1.11
Maximum Month	1.31	1.17	1.25	1.31	1.26	1.26
Maximum Week	1.60	1.28	1.32	1.37	1.37	1.39
Maximum Day	2.03	1.75	2.09	1.67	1.90	1.89
TSS						
Average Dry Weather Load	1.0	1.0	1.0	1.0	1.0	1.0
Average Annual	1.07	1.11	1.17	1.11	1.06	1.10
Maximum Month	1.30	1.34	1.58	1.28	1.25	1.35
Maximum Week	1.94	1.72	1.97	1.55	1.57	1.75
Maximum Day	3.05	4.75	4.58	2.50	3.84	3.74
Maximum Week	1.48	1.33	1.38	1.64	1.23	1.41
Maximum Day	1.48	1.33	1.38	1.64	1.23	1.41

5.0 WASTEWATER FORECASTING METHODOLOGY

This section outlines the methodology used to project future wastewater flows and loadings to the OWTP. Based on a review of the available data, it was determined that the most accurate wastewater forecasting approach for this PWIMP is a combination of a population-based per capita method for domestic (residential and commercial), and a land use based projection method for industry.

5.1 Domestic/Commercial Projections

Residential and commercial wastewater flow and load projections were estimated using the population projections outlined in PM 1.3 plus the 2010 US Census Port Hueneme population. A per capita daily flow of 71.6 gpd/capita, a per capita daily BOD load of 0.20 ppd/capita, and a per capita daily TSS load of 0.17 ppd/capita were used to project flows and loadings to the OWTP in conjunction with population projections.

5.2 Industrial Projections

Industry was projected in two components: existing industry and new industry. For existing industry, it was assumed that the 30 SIUs currently discharging at or above their permitted flow would continue to discharge at existing 2013 flows and loadings through the planning horizon. There are six remaining industries that discharge less flow than what their

discharge permit allows. As a conservative estimate, it was assumed that these industries would discharge flow at their permit limit. This additional flow was assumed to have a BOD and TSS concentration consistent with average industry BOD and TSS concentrations. This was assumed since some industries have no historical loading data.

New industry wastewater flow projections were estimated using water demand projections outlined in PM 2.2. In PM 2.2, new industrial developments were discussed for Sakioka Farms, El Camino, and South Shore. Industrial infill was also mentioned. These additional industrial demands were calculated via future land use and allocated for 2020 and for 2040. Table 8 outlines these demands. As a conservative estimate, it was assumed that the wastewater generation coefficient for this additional industrial water demand is 1.0. Additionally, it was assumed that new industry would grow linearly from 0 to the 2020 water demand projections and then linearly again to the 2040 water demand projections. Figure 5 summarizes this industrial growth projection.

BOD and TSS concentrations for this new industrial wastewater component were assumed to be 850 ppd and 400 ppd, respectively. These values were chosen based on a review of the range of historical industrial wastewater strengths, and on best professional judgment.

Table 8 Near-Term Industry Demand and Wastewater Flow Projections
Public Works Integrated Master Plan
City of Oxnard

Map ID	Development Name	Dev. Size acres	Demand Factor (gpd/ac)	ADD by 2020 (mgd)	ADD by 2040 (mgd)
6	Sakioka Farms Industry	280.5	3500	0	0.98
7	El Camino Industry	79.2	3500	0	0.28
13	South Shore Industry	31.63	3500	0	0.11
16	Industrial Infill	106	3500	0.36	0.37
	Total			**0.36**	**1.74**

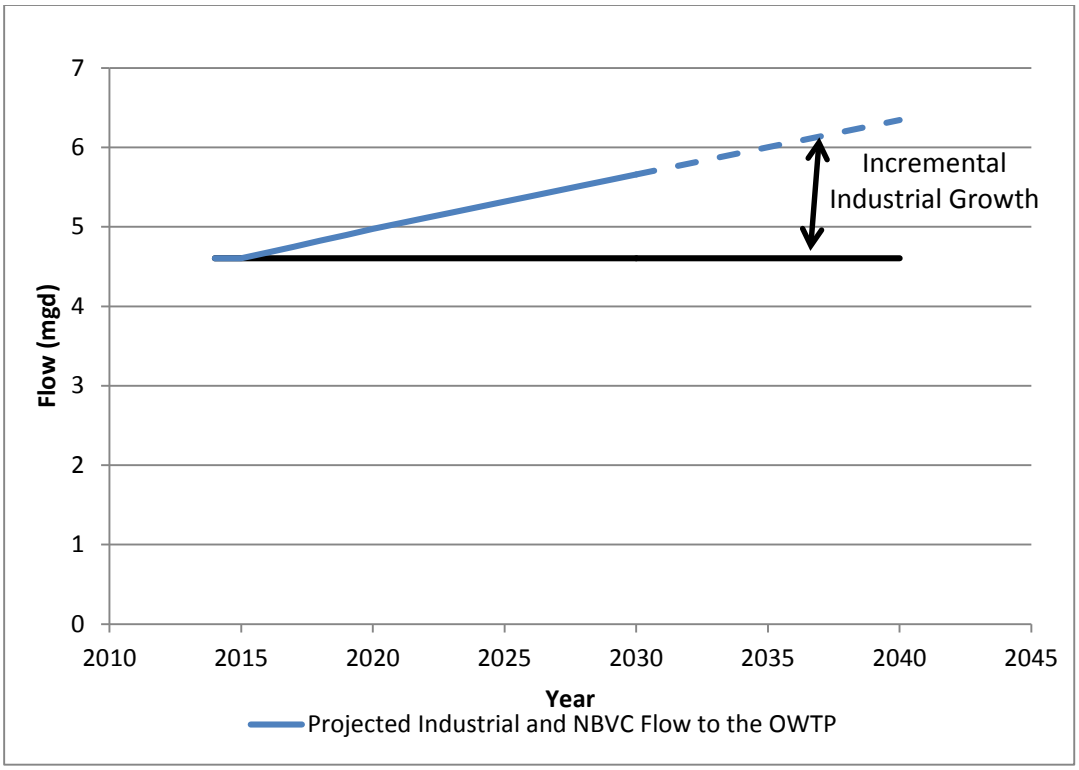

Figure 5 Industrial Growth Projection

5.3 Naval Base Ventura County Projections

Similarly to industrial flow and load projections, it was assumed that both NBVC at Point Mugu and NBVC at Port Hueneme would discharge at their permitted limit throughout the planning period. It was also assumed that the additional flow projected for these NBVCs would have a BOD and TSS concentration consistent with the average residential/ commercial concentrations. This assumption seems reasonable since these two wastewater dischargers are mainly domestic wastewater.

5.4 Desalter Concentrate Projections

Projected desalter concentrate flows and loads from the Oxnard Desalter and Port Hueneme Water Agency Desalter were not included in the flow projections to the OWTP headworks. This is because the desalter concentrate composition of total dissolved solids are not anticipated to impose a demand on the primary and secondary wastewater treatment unit operations at OWTP. Additionally, in the future, it is planned that the desalter concentrate will be discharged to the outfall through a separate concentrate line, bypassing the OWTP.

6.0 FUTURE WASTEWATER DEMAND PROJECTIONS

This section summarizes the flow and load projections anticipated through 2040. The purpose of the master planning projections presented in this section is to allow for a conservative estimate of future wastewater flows and loadings. The projections presented herein are the basis for triggering the preliminary design of future treatment facilities in time to allow for the typical five to seven years that it takes to implement new wastewater capacity. Once the preliminary and final designs of those facilities are triggered, however, the need and timing will be further reviewed and confirmed. Nevertheless, over the 20-year planning horizon, it is anticipated that these projected flows and associated facilities will be realized.

6.1 Flow Projections

The projected ADW flow is summarized in Table 9, categorized by use type; Figure 6 illustrates both ADW flow and ADMM flow projections (in aggregate). While historical flow records indicate a decrease in influent flows to the plant, this observed decline in recent years is likely due to the current drought. The drought has likely caused a reduction in water usage and observed groundwater infiltration in the collection system. Both of these effects result in decreased flows to the OWTP. Therefore, based on our best professional judgment, there should be an allowance for a "rebound" effect following a return to more normal rainfall patterns in the future, as shown in the PWIMP flow projections.

Table 9 OWTP ADWF Projections
Public Works Integrated Master Plan
City of Oxnard

Year	Population	Residential/ Commercial (mgd)	Existing Industry and NBVCs (mgd)	Existing Industry and NBVCs Additional Permitted Flow (mgd)	New Industry (mgd)	Desalter Concentrate (mgd)	Total (mgd)
2015	232,596	16.6	5.20	0.44	0	0	22.3
2020	241,971	17.3	5.20	0.44	0.37	0	23.3
2025	251,345	18.0	5.20	0.44	0.71	0	24.3
2030	260,719	18.7	5.20	0.44	1.06	0	25.3
2035	270,093	19.3	5.20	0.44	1.40	0	26.4
2040	279,468	20.0	5.20	0.44	1.74	0	27.4

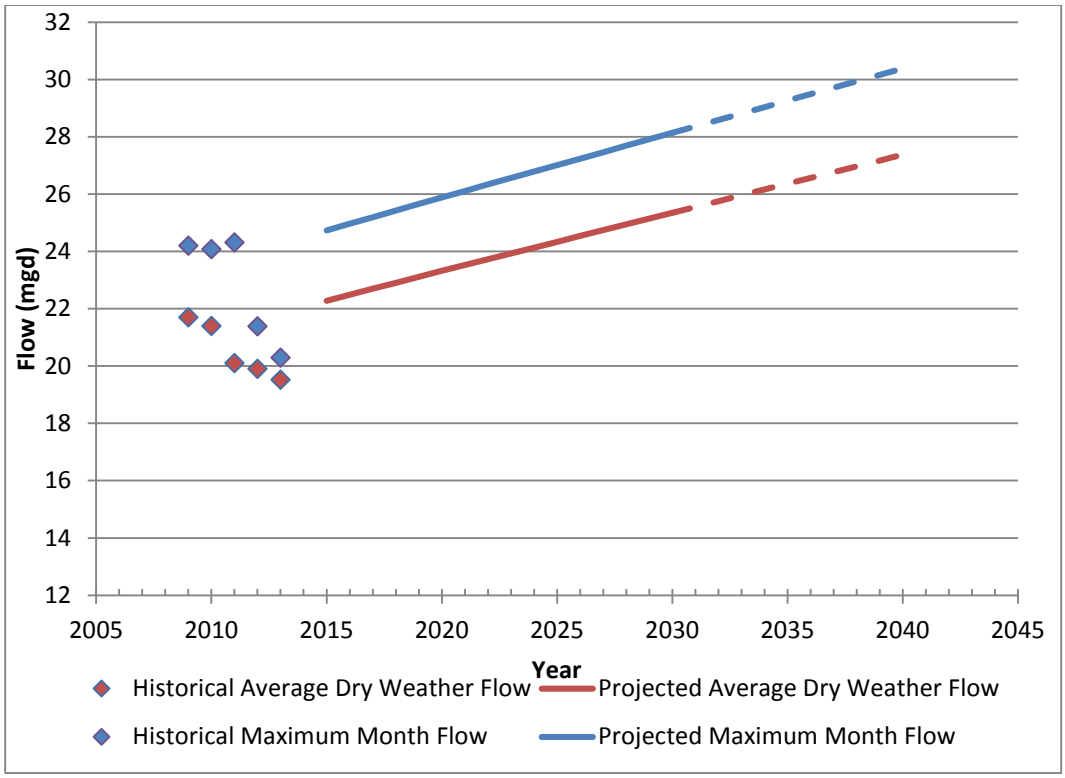

Figure 6 Projected OWTP Influent Flow

6.2 Load Projections

Wastewater ADWL and MM BOD and TSS loading projections are summarized in Tables 10 and 11 and illustrated in Figures 7 and 8. These loading projections are divided by discharge type in the table and shown in aggregate in the figure.

Table 10 OWTP Average Dry Weather BOD Load Projections
Public Works Integrated Master Plan
City of Oxnard

Year	Population	Residential/ Commercial (ppd)	Existing Industry and NBVCs (ppd)	Existing Industry and NBVCs Additional Permitted Flow (ppd)	New Industry (ppd)	Desalter Concentrate (ppd)	Total (ppd)
2015	232,596	46,276	6,070	429	0	0	52,774
2020	241,971	48,141	6,070	429	2,623	0	57,262
2025	251,345	50,006	6,070	429	5,051	0	61,555
2030	260,719	51,871	6,070	429	7,479	0	65,848
2035	270,093	53,736	6,070	429	9,907	0	70,145
2040	279,468	55,601	6,070	429	12,335	0	74,443

Table 11 OWTP Average Dry Weather TSS Load Projections Public Works Integrated Master Plan City of Oxnard							
Year	Population	Residential/ Commercial (ppd)	Existing Industry and NBVCs (ppd)	Existing Industry and NBVCs Additional Permitted Flow (ppd)	New Industry (ppd)	Desalter Concentrate (ppd)	Total (ppd)
2015	232,596	40,570	5,431	378	0	0	46,378
2020	241,971	42,205	5,431	378	2,623	0	50,636
2025	251,345	43,840	5,431	378	5,051	0	54,699
2030	260,719	45,475	5,431	378	7,479	0	58,762
2035	270,093	47,110	5,431	378	9,907	0	62,826
2040	279,468	48,745	5,431	378	12,335	0	66,889

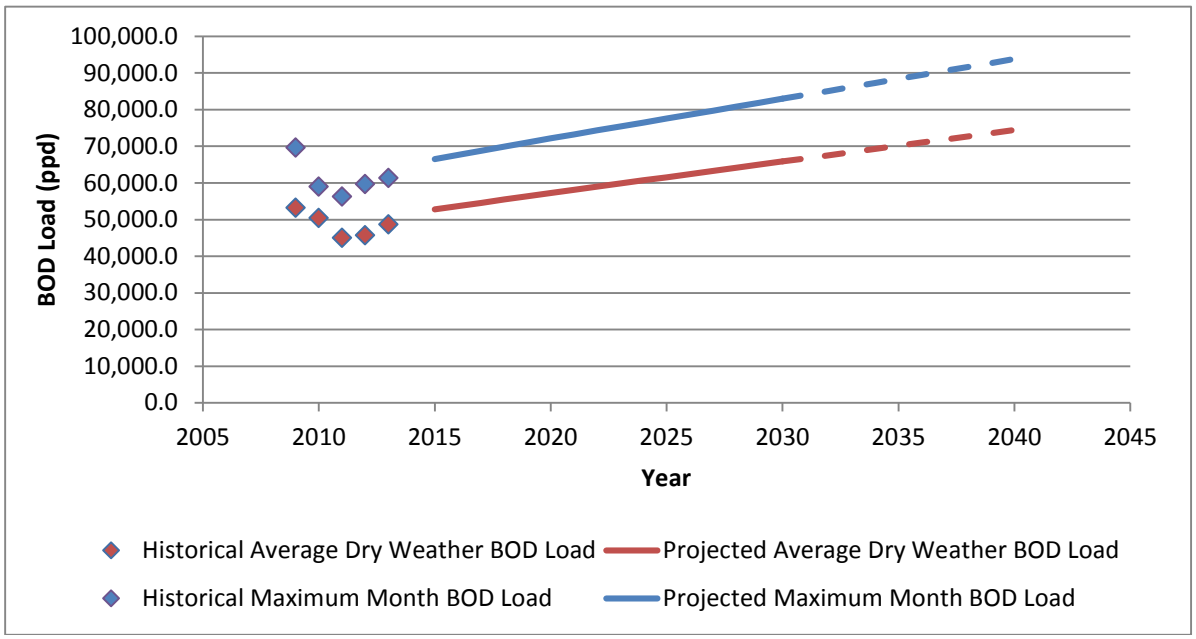

Figure 7 Projected OWTP Influent BOD Load

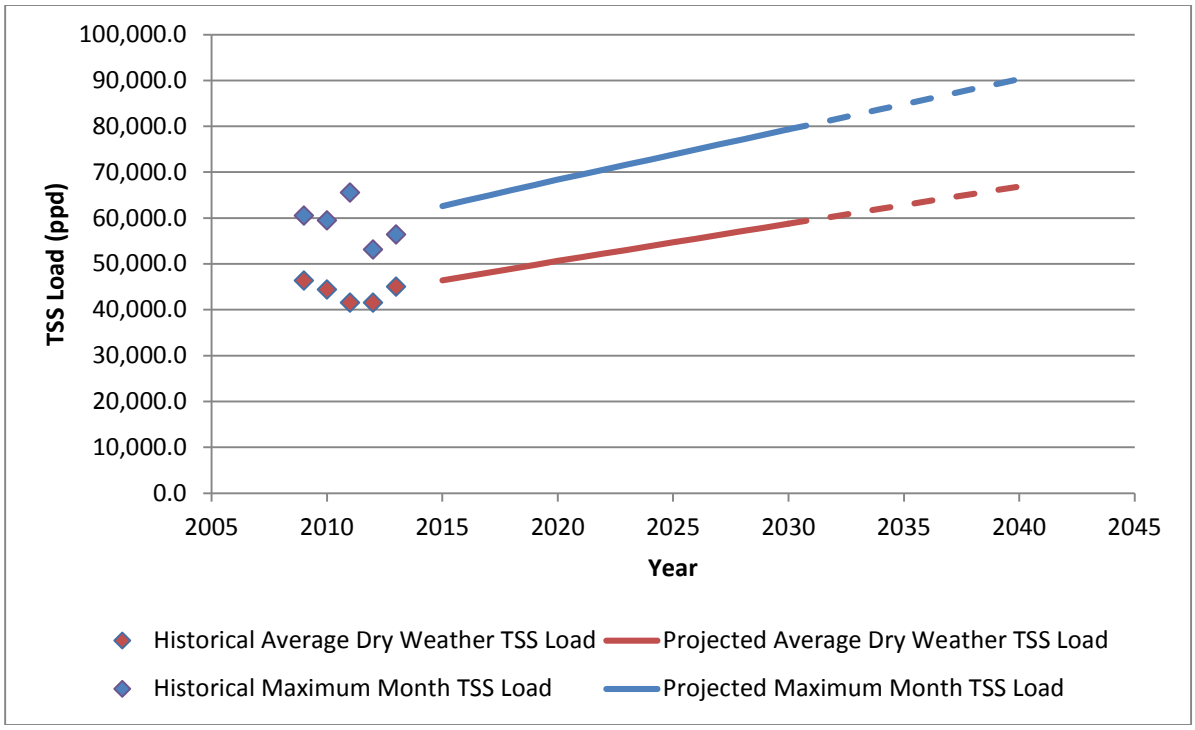

Figure 8 Projected OWTP Influent TSS Load