COMPREHENSIVE WASTEWATER FACILITIES STRATEGIC PLAN

for
MISSION SPRINGS WATER DISTRICT

Prepared by

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1.0 INTRODUCTION

Tetra Tech, Inc. was retained by Mission Springs Water District (MSWD) to conduct investigations and prepare a Comprehensive Wastewater Facilities Strategic Plan (CWWFSP). The CWWFSP is partially funded by the Army Corps of Engineers in an effort, to protect groundwater quality, to maximize water resources within MSWD's service area, and to increase future recycled water use opportunities based upon the wastewater facilities implementation schedule. The CWWFSP is a scheduling and planning document and is not intended to address the depth of design detail required of a Preliminary Design Report (PDR).

The MSWD's 2007 Wastewater Master Plan (07 WWMP or Master Plan) projects large wastewater flow increases in the near-future due to population growth within the service area and the establishment of sewer assessment districts to implement the groundwater protection program. These current and future flow projections will be evaluated in the CWWFSP and used as the basis of implementation of MSWD wastewater facilities improvements. Recommended expansions at the Horton Wastewater Treatment Plant (HWWTP) and demolition of Desert Crest Wastewater Treatment Plant (DCWWTP) will be considered in developing the schedule for construction of the proposed Regional Wastewater Treatment Plant (RWWTP). A timeline for implementation of these facilities will be established and included in the CWWFSP. Refer to Figure 1.1 for the location of the various facilities discussed in this document.

Based on the 07 WWMP, the RWWTP will be a tertiary level treatment plant utilizing extended aeration and Membrane Bioreactor (MBR) technology.

VICINITY MAP

N.T.S.

MISSION SPRINGS REGIONAL
WASTEWATER TREATMENT PLANT

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TETRA TECH

Figure 1-1

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Effluent from the RWWTP will be discharged to recharge basins for groundwater recharge and/or utilized for landscape, park, or golf course irrigation.

To minimize odor problems at the HWWTP, solids treatment facilities at RWWTP will be sized to handle the solids generated from both the HWWTP and the RWWTP. Waste activated sludge solids will be transported via the sewer system to the RWWTP where the combined solids will be processed at a centralized facility designed to meet Class A Bio-solids standards for disposal and unrestricted use.

Included in the CWWFSP will be a general site layout of the RWWTP facilities. The layout will emphasize plant hydraulic profile configurations to take advantage of elevation and grades across the site and to address aesthetic concerns. The CWWFSP will also include development of anticipated milestones for design, bid and construction of the proposed RWWTP based on the evaluation of the current and near term wastewater flow estimates.

Previous Studies:

Previous studies by MSWD utilized to complete the CWWFSP include the following:

- 2007 Wastewater Master Plan (07 WWMP or Master Plan)
- Water Recycling Feasibility Study (RWFS)
- Recycled Water Project Initial Study/Environmental Assessment (RWIS)
- 2005 Urban Water Management Plan (05 UWMP)

- Preliminary Design Report for Horton Wastewater Treatment Plant Expansion No. 5 (HPDR-5)
- Geotechnical Investigation Report, Proposed Future Regional Wastewater Facility, Desert Hot Springs, California (GIR)

These studies include crucial information regarding existing waste water facilities, future waste water flow projections, hydraulic design criteria and other useful information required to complete the CWWFSP.

2.0 EXECUTIVE SUMMARY

Introduction:

- Tetra Tech, Inc. was retained by Mission Springs Water District to prepare a Comprehensive Wastewater Facilities Strategic Plan (CWWFSP).
- The CWWFSP is a scheduling and planning document and is not intended to address the depth of design detail required of a Preliminary Design Report (PDR)
- Recommended expansions at the Horton Wastewater Treatment Plant (HWWTP) and abandonment of the Desert Crest Wastewater Treatment Plant (DCWWTP) will be considered in determining the schedule for proposed construction of the Regional Wastewater Treatment Plant (RWWTP).
- Effluent from RWWTP will be discharged to recharge basins for groundwater recharge and/or utilized for landscape irrigation.
- Solids processing and disposal will be centralized at the RWWTP and designed to meet Class A bio-solids standards.
- Previous studies prepared for MSWD and utilized in development of the CWWFSP are listed in report Section 1.0 – INTRODUCTION.

System Flows:

- There are currently two separated sanitary sewer collection systems serving the MSWD. The Horton Wastewater Treatment Plant (HWWTP) serves the City of Desert Hot Springs and the adjacent unincorporated areas. The small Desert Crest Wastewater Treatment Plant (DCWWTP) serves the community of Desert Crest and some surrounding areas.

- Development of the Regional Wastewater Treatment Plant (RWWTP) will treat the excess flow from the existing systems and provide treatment for the additional projected flows in the area.

- The small communities of Palm Springs Crest and West Palm Springs, located in the southwestern corner of the MSWD service area, will continue to be served by individual septic tanks and drain fields. There is currently no plan to extend sewer service to this area in the immediate future.

- The master plan (07WWMP) projects 60,320 new dwellings could be developed within the MSWD service area.

- The District's ongoing program to eliminate existing individual treatment systems within existing service areas will add 5,998 dwelling units (1.20 mgd) to the system by 2016.

- There are 15,510 new dwelling units (3.10 mgd) approved for development by 2017. The current national down turn in the housing industry is resulting in delay of some of these projects.

- Using 2006 ADF (Average Daily Flow) of 1.37 mgd, projected 2026 ADF for the district are (refer to report Table 3.1):
  - 9.09 mgd (07WWMP projection)

  - o 8.60 mgd (07WWMP adjusted for 2008 ADF of 1.60 mgd)
  - o 7.74 mgd (07WWMP adjusted for five years reduced growth)

- Scheduling of major improvement projects should be keyed into actual wastewater flows.
- Peaking factors for new RWWTP. Dry Weather Peaking Factor, D-PF=1.40. Wet Weather Peaking Factor, W-PF=2.00.

Treatment Systems and Capacities:

- HWWTP: Current capacity is 2.3 mgd (2.0 mgd permitted) and is currently being expanded to 3.0 mgd.
- DCWWTP: Current capacity is 0.18 mgd (0.09 mgd permitted for redundancy requirements). DCWWTP is scheduled to be decommissioned when the RWWTP comes on line.
- Effluent Disposal: Ground water recharge basins.
- Solids Disposal: Sludge is air dried or dewatered by belt filter press and hauled offsite on a weekly basis.

Design Flows and Loadings:

- HWWTP: Design ADF=3.0 mgd. Waste activated sludge (WAS) transferred by sewer system to RWWTP for additional treatment and disposal.
- DCWWTP: To be decommissioned and flows transferred to RWWTP.
- RWWTP: Refer to Figure 2-1 below:

TABLE 2.1 – RWWTP DESIGN FLOWS AND LOADINGS

Parameter	Phase I Initial Phase II Phase III	Phase IV	Phase V	Ultimate Build Out (Double)
FLOW				
Average Daily Flow, mgd	2.0 4.0 6.0	8.0	10.0	20.0
Peak Hour Flow, mgd	4.0 8.0 12.0	16.0	20.0	40.0
INFLUENT (Max. Month)				
BOD_5, mg/L	300 300 300	300	300	300
BOD_5, lbs/day	5,003 10,006 15,010	20,000	25,020	50,040
TSS, mg/L (RWWTP)	325 325 325	325	325	325
TSS, lbs/day (RWWTP)	5,420 10,840 16,260	21,680	27,110	54,210
WAS TSS, lbs/day[1] (HWWTP)	5,210	5,210	5,210	5,210
Sum TSS, lbs/day	10,630 16,050 21,470	26,890	32,320	59,420
NH_4-N, mg/L	23 23 23	23	23	23
NH_4-N, lbs/day	500 1,000 1,500	2000	2500	5005
TKN, mg/L	30 30 30	30	30	30

TKN, lbs/day	1500	2000	2500	5005
EFFLUENT LIMITS				
BOD_5, mg/L	30	30	30	30
TSS, mg/L	30	30	30	30
NO_3-N, mg/L	<10	<10	<10	<10
Total Nitrogen TN, mg/L	10	10	10	10

[1] Based on projected maximum month waste activated sludge discharge from HWWTP per HPDR-5, Section 4.4 adjusted for a flow of 3.0 mgd.(6600x3.0/3.8 = 5210).

Regional Wastewater Treatment Plant

- Locate on site west of Little Morongo Road between 19th Avenue and 20th Avenue.
- Phase development in 2.0 mgd capacity stages to prevent overbuilding treatment facilities. Initial construction of 2.0 mgd may need to be increased to 4.0 mgd to provide system redundancy. This is to be determined during the preliminary design phase.
- Process: Tertiary level extended aeration activated sludge process with anoxic pre-aeration stage and membrane Bioreactor (MBR) technology for effluent filtration.
- Screenings/grit Disposal: Haul away daily to certified landfill.
- Sludge Disposal: Sludge Dewatering and drying to be designed to meet Class A Bio-solids standards. Hauling and disposal by third party.

- Effluent disposal: Ground water recharge basins and/or recycling for landscape irrigation

Interceptor Sewers (Refer to report Figure 7-1)

- To deliver wastewater to the new RWWTP a system of four new interceptors was recommended in the Master Plan (07WWMP).
    - Interceptors 1A through 1G (2008-2012): 44,276 lineal feet of new 12-inch through 27-inch diameter sewers serving the existing HWWTP and DCWWTP collection systems.
    - Interceptors 2A through 2O (2012-2016): 46,301 lineal feet of new 8-inch through 33-inch sewers serving the area between 19th Avenue and Dillon Road west of Little Morongo Road and areas north of Mission Lakes Blvd. and west of Indian Avenue. Also 6075 lineal feet of 12-inch through 21-inch replacement sewer in Desert Hot Springs.
    - Interceptors 3A through 3M (2017-2021): 44,197 lineal feet of new 8-inch through 27-inch sewers serving the areas north of Dillon Road west of Indian Avenue. Also 5,940 lineal feet of 15-inch through 21-inch replacement sewers in Desert Hot Springs.
    - Interceptors 4A through 4H (2022-2026): 40,604 lineal feet of new sewer along Indian Avenue, 20th Avenue and Dillon Road to fill out the collection system.

- Design and construction schedule to be modified as needed to meet development demands.

Strategic Plan Recommendations:

- Facility Development Process consists of four stages:
    - Prepare district wide Wastewater Master Plan (Completed)
    - Prepare Comprehensive Wastewater Facilities Strategic Plan (this document)
    - Design Project including selecting engineer, preparing Preliminary Design Report, and preparing design plans, specifications and bidding documents.
    - Construct Project including bidding the project, constructing the project, training staff and operators, and commissioning the project.
- Design can take between 9 months for a sewer project to 20 months for a treatment plant depending on size and complexity of the project.
- Construction of a project can take between one and three years depending again on size and complexity.
- Development Schedule is shown in Table 2.2 below (from report Table 8.1). ID number refers to the task number shown in Figure 8.1 of the report.

TABLE 2.2 – FACILITY DEVELOPMENT SECHEDULE (From Table 8.1)

ID No. (Fig. 8.1)	Event/Activity	Trigger	Projected Dates
1	HWWTP Expansion 5 Improvements	In process	2008-2009
4*	Design Interceptor Segments 1-A through 1-G • Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month)	HWWTP Completion	2008-2009 10/08 – 12/08 1/09 – 7/09 8/09
8	Construct Interceptor Segments 1-A through 1-G • Bid (2-months) • Construction (Phased) • Transfer flows (2-months)	Complete Design	2010-2012 5/10 – 7/10 7/10 – 5/11 3/12 – 5/12
20	RWWTP Phase I-Design • Select Engineer (3-months) • Project Design (14-months) • Approvals (2-months)	District ADF = 2.3 mgd	2008-2010 10/08 – 12/08 12/08 – 1/10 1/10 – 4/10
25*	RWWTP Phase I-Construction • Bid (2-months) • Construction (17-months) • Commissioning (2-months)	Design Complete	2010-2012 5/10 – 8/10 9/10 –11/11 12/11 – 2/12
30	Decommission DCWWTP • Design and Construction	RWWTP Completion	2011 - 2013
36	RWWTP Phase II-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	District ADF = 4.0 mgd	2014-2015 To be determined in future
41	RWWTP Phase III-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	District ADF = 5.6 mgd	2020-2021 To be determined in future
46	Design and Construct Interceptor Segments 2-A through 2-O • Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month) • Bid (2-months) • Construction (6-months)	RWWTP Completion	2012-2013 To be determined in future
53	Design and Construct Interceptor Segments 3-A through 3-M	Segments 2 Complete	2017-2018

	• Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month) • Bid (2-months) • Construction (6-months)		To be determined in future
60**	RWWTP Phase IV-Design Update • Update Design (5-months) • Approvals (2-months)	District ADF = 7.6 mgd	2022
64	RWWTP Phase IV-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	Design Complete	2022-2024 To be determined in future
69	Design and Construct Interceptor Segments 4-A through 4-G • Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month) • Bid (2-months) • Construction (6-months)	Segments 3 Complete	2022-2023 To be determined in future
76**	RWWTP Phase V-Design Update • Update Design (5-months) • Approvals (2-months)	District ADF = 9.8 mgd	2028
80	RWWTP Phase V-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	Design Complete	2029-2030 To be determined in future
N/A	Future RWWTP Expansions	When ADF reaches around 80% total plant capacity	To be determined in future

* RWWTP Phase I and Interceptor Sewer (Segment 1) construction to be concurrent. Activate interceptor at completion of RWWTP.

** Phase IV and V design completed in conjunction with Phase I through III design but will require updating to reflect changes in operation. If growth warrants, Phase IV and Phase V construction could be done at the same time.

Projected Costs:

- Costs will need to be adjusted as the projects go through the design process and actual quantities are established.
- Costs were extracted to those developed in the Master Plan (07WWMP) and increased to reflect the escalation of costs between June 2007 and June 2008.
- Master Plan costs reflected total project costs. These were reallocated to separate design from construction.
- The Project Cost Summaries have been grouped in 5-year increments with the first (shorter one) ending in 2010. Costs from the present through 2035 are shown in Table 2.3 (report Table 9.2). Note that the Design Cost in Line No. 20 is for RWWTP Phases I through III. Construction costs for these phases are then shown in Lines No. 25, 36 and 41.

TABLE 2.3 - PROJECT COST SUMMARY (Present through 2035)

Line No.	Project	Present thru 2010	2011 thru 2015	2016 thru 2020	2021 thru 2025	2026 thru 2030	2031 thru 2035	Total Costs
1	*HWWTP Expansion 5	$20,000,000						$20,000,000
4	Design Interceptors 1A-1G	$3,827,900						$3,827,900
8	Const. Interceptors 1A-1G	$14,637,000	$8,877,300					$23,514,300
20	Design RWWTP Phases I-III	$19,170,000						$19,170,000
25	Const. RWWTP Phase I	$10,146,900	$29,143,100					$39,290,000
30	Decommission DCWWTP		$515,500					$515,500
36	Const. RWWTP Phase II		$29,140,000					$29,140,000
41	Const. RWWTP Phase III			$7,131,500	$21,508,500			$28,640,000
46	Design/Construct Interceptors 2A-2Q		$19,250,290					$19,250,290
53	Design/Construct Interceptors 3A-3M			$25,494,120				$25,494,120
60	Design RWWTP Phase IV				$5,952,000			$5,952,000
64	Const. RWWTP Phase IV				$25,142,600	$3,594,400		$28,737,000
69	Design/Construct Interceptors 4A-4G				$20,354,500			$20,354,500
76	Design RWWTP Phase V					$5,510,000		$5,510,000
80	Const. RWWTP Phase V					$12,500	$28,627,500	$28,640,000
	FIVE YEAR TOTALS	**$67,781,800**	**$86,926,190**	**$32,625,620**	**$72,957,600**	**$9,116,900**	**$28,627,500**	**$298,035,610**

* Existing project

ENR CCI LA 9274 (June 2008)

3.0 SYSTEM FLOWS

MSWD Service Area:

The MSWD service area encompasses 135 square miles in the northwest Coachella Valley, California, and serves mainly the City of Desert Hot Springs and surrounding unincorporated areas. It also serves the villages of Palm Springs Crest and West Palm Springs located in the far southwest corner of the district, west of the City of Desert Hot Springs.

There are currently two separated sanitary sewer collection systems serving the MSWD. The main system serves the City of Desert Hot Springs and the adjacent unincorporated areas served by the Horton Wastewater Treatment Plant (HWWTP). The second collection system services the Desert Crest community and surrounding areas with wastewater treated at the small Desert Crest Wastewater Treatment Plant (DCWWTP). These two systems will be combined in the future with an expansion of the systems and the development of the Regional Wastewater Treatment Plant (RWWTP).

Because of their remoteness from any centralized treatment facility, the communities of Palm Spring Crest and West Palm Springs, located in the southwestern corner of the MSWD service area, will continue to be served by individual septic tanks and drain fields. There is no plan to extend sewer service to this area in the immediate future.

Flow Factors

The volume of wastewater arriving at a wastewater treatment plant will vary due to various factors within the collection system it serves. These include:

- The number, density, and type of service connections
- Land use
- Time of day
- Distance to point of discharge
- The extent of wet weather inflow and infiltration
- Slope and size of sewer lines

Peaking factors from diurnal variations in flow and the increases due to inflow and infiltration vary greatly with the size and distance waste water must flow. In general the smaller the service area being considered, the higher the peaking factors will be. This is because inflow peaks are dampened the greater the distance it must travel and the larger the pipe size. Peaks will also be higher if there is a greater density of service connections. For example peaking factors will be higher for sewers serving high density housing or mobile home parks than those serving areas of single family homes.

Infiltration is water that enters the system from ground water intrusion through cracks or open joints in the sewer lines or manholes. Typically, most infiltration occurs in the service laterals between the sewer main and house due to poor sewer construction or improper materials. Water migrating through the soil increases during rain events resulting in an increase of infiltration through pipe cracks and joints.

Significant storm water inflow can occur at manholes if they are located where water ponds during a storm. In addition some customer may use their sewer connections to get rid of storm water or foundation water problems.

Because of the high cost of treating sewer infiltration and inflow (I/I), the district needs to carefully inspect all service connections when they are installed and have an ongoing program for repair of problem areas. Some districts even charge a treatment surcharge if a service lateral is documented to have I/I problems.

Flow Projections

The Master Plan (07WWMP) concluded that future residential developments within the MSWD boundary will eventually add 60,320 new dwelling connections to the collection systems. The volume of wastewater in the system will also be influenced by expansion of existing developments, future commercial developments, increases in high density dwelling units, and an increase in the number of people living in a dwelling unit.

MSWD is also conducting groundwater quality protection projects in an effort to eliminate individual septic systems within the service area, which in turn increases the number of service connections and flows to the sewer system. The areas using septic systems have been categorized into Assessment District 11 (AD-11) and Assessment District 12 (AD-12). AD-11 was passed by voters in 2000 and sewer construction completed in 2006. As a result, 1233 parcels were provided with access to the sewage system and 996 septic tanks abated. AD-12 was passed by voters in 2004 with sewer construction projected for completion in 2014. AD-12 is prioritized into 10 different areas under this order; Area L, M, F, D, J, A, H, I, K and G. Area L is currently being constructed and will be completed by late 2008. According to the Master Plan, AD-12 will add approximately 2,000 dwelling units to the collection system by 2009 and an additional 4,000 dwelling units by 2016.

Based on projected growth and the abatement of existing septic tank systems between FY 2006 to FY 2026, future total average daily wastewater flows for MSWD were projected in the Master Plan as shown in Table 3.1 (07 WWMP).

The Master Plan projects that the septic tank abatement project AD-12 will add 0.133 mgd additional flow per year between 2007 and 2009 with 0.114 mgd additional flow per year between 2009 and 2016. Future developments are projected to add approximately 20,000 additional service connections to MSWD through 2026. It is projected that the existing systems will expand by 5,998 dwelling units (1.20 mgd) by 2016 resulting from Assessment District 12 plus an additional 15,510 dwelling units (3.10 mgd) by 2017 from approved development projects. Some additional development growth above that already approved was also included in the projections in Table 3.1 (07 WWMP).

Due to the recent national economic downturn in the housing industry, the District has experienced a moderation or delay in development growth. Actual increase in flows for the past two years has averaged only eight percent in contrast to the twenty percent projected in the Master Plan. Two additional columns have been included in Table 3.1. One shows flow projections based on the actual 2008 ADF of 1.60 mgd. The second projects flows with development moderated to 8-percent per year for the next five years and then 07 WWMP growth rate projections thereafter.

TABLE 3.1 – PROJECTED MSWD WASTEWATER FLOWS

(Refer also to Figure 5.1 for a graphic presentation of data)

Year	07 WWMP Avg. Day Flow (mgd)[1]	Adjusted Avg. Day Flow (mgd)[2]	Adjusted Avg. Day Flow (mgd)[3]
2006	1.37	1.37	1.37
2007	1.69	---	---
2008	2.04	1.60	1.60
2009	2.42	1.95	1.73
2010	2.80	2.33	1.86
2011	3.21	2.71	2.01
2012	3.60	3.12	2.17
2013	4.02	3.51	2.55
2014	4.47	3.93	2.93
2015	4.95	4.38	3.34
2016	5.48	4.86	3.73
2017	5.80	5.39	4.17
2018	6.13	5.71	4.62
2019	6.49	6.04	5.10

2020	6.86	6.40	5.63
2021	7.26	6.77	5.95
2022	7.59	7.17	6.28
2023	7.94	7.50	6.64
2024	8.31	7.85	7.01
2025	8.69	8.22	7.41
2026	9.09	8.60	7.74

[1] From 2007 Wastewater Master Plan (07 WWMP) Table 2-15.

[2] Adjusted flows based on actual (2008) ADF = 1.60 mgd with 07 WWMP projected growth thereafter.

[3] Adjusted flows based on continued reduced growth (8%/year) for next five years with 07 WWMP projected growth rate thereafter.

As can be seen, the projected wastewater flow for FY 2026 is 9.09 mgd, an increase of more than 5 times the projected 2007 flow of 1.69 mgd. This projection is already reduced to 8.60 mgd based on the actual 2008 flow of 1.60 mgd because of the depressed housing market. If development continues to be depressed due to an economic slowdown, the 2026 flow projection could be reduced to around 7.74 mgd. For this reason it is recommended that actual development be carefully tracked on a continuous basis and flow projections modified accordingly with major improvement projects keyed into actual wastewater flows.

Peaking Factors

Peaking factors of greatest concern for design are the Dry Weather Peaking Factor (D-PF) which is the ratio of Peak Dry Weather Flow (PDF) to Average Daily Flow (ADF), and Wet Weather Peaking Factor (W-PF) which is the ratio of Peak Wet Weather Flow (PWF) to Average Daily Flow (ADF). These factors are important because some treatment components need to be designed to process the highest anticipated flow while others are designed on the basis of the average daily flow (ADF).

The PDF defines the peak hourly flow resulting from normal diurnal flow variations expected throughout a normal day together with normal baseline infiltration. The PWF, on the other hand, represents the peak hour flow that is expected to occur during a major rain event from increased infiltration and direct inflow. This event can occur during any hour of the day. The increased flows will be dependent upon the duration and intensity of the rainfall event.

The peaking factors evaluated in the 2007 Sewer Master Plan (Master Plan) at the Horton WWTP and Desert Crest WWTP were based on the flow records at those two treatment plants and are as shown in Table 3.2. Also shown are the anticipated peaking factors anticipated at the new Regional Wastewater Treatment Plant. As can be seen in Table 3.2, the peaking factors become attenuated as the sewer system gets larger. Storage capacity within the sewer system piping acts similar to a reservoir and so the peaks become less pronounced but extend over a longer time period. On the other hand, it can be expected that as development density increases the number of connections per mile of sewer will increase and so the diurnal peaks will become a little more pronounced in the future. For this reason a dry weather peaking factor of 1.40 has been selected for the proposed Regional Wastewater Treatment Plant.

TABLE 3.2 – PEAKING FACTORS

Treatment Plant	**Rated Average Daily Dry Weather Flow, ADF**	**Dry Weather Peaking Factor, D-PF[1]**	**Wet Weather Peaking Factor, W-PF[2]**
Horton WWTP	2.00	1.33	2.29
Desert Crest WWTP	0.09	2.00	4.07
Proposed Regional WWTP[3]	8.00	1.40	2.00

[1] Ratio of Peak Hourly Dry Weather Flow to Average Daily Dry Weather Flow.

[2] Ratio of Peak Hourly Wet Weather Flow to Average Daily Dry Weather Flow.

[3] Factors for design of RWWTP are from current MSWD criteria, (Table 5-4, Master Plan)

4.0 TREATMENT SYSTEMS AND CAPACITIES

Existing Treatment Facilities

At the present time there are two treatment plants serving the MSWD, the Horton Wastewater Treatment Plant (HWWTP) and the Desert Crest Wastewater Treatment Plant (DCWWTP).

Horton Wastewater Treatment Plant: The HWWTP was constructed in 1973 with an initial flow of 0.06 mgd and initial plant capacity of 0.20 mgd. Due to the rapid growth in Desert Hot Springs and within the MSWD boundary, the HWWTP has gone through several expansions and now has 2.3 mgd capacity (2.0 mgd permitted). The HWWTP was operating at 61% capacity during 2006.

The Master Plan specified expansion of the HWWTP to 3.8 mgd by 2009, before construction of the RWWTP. However, due to the close proximity of the new developments, it was determined by MSWD that the HWWTP could only be expanded to 3.0 mgd. The HWWTP is currently under expansion to increase capacity to this 3.0 mgd level.

The future sewer interceptor system will be designed to restrict flow to the HWWTP to 3.0 mgd or less. Waste activated sludge from the plant will be returned to the interceptor sewer for delivery to the Regional Wastewater Treatment Plant. This will eliminate potential odor problems from sludge handling at the site.

The current discharge requirements for the HWWTP are:

1. Discharge permit rated capacity – 2.0 mgd (increasing to 3.0 mgd)

2. 5-day biological Oxygen Demand (BOD_5) – 30 mg/L 30-day arithmetic mean/ 45 mg/L 7-day arithmetic mean

3. Total Dissolved Solids (TDS) – not exceeding 400 mg/L over that contained in the community water supply (423 to 486 mg/L water supply TDS)

4. No discharge to surface waters

5. Conform to the US EPA designated 126 Priority Pollutants Limits

Horton Treatment Process: The treatment plant currently treats wastewater using an extended aeration secondary treatment process. Major treatment components at the HWWTP include:

1. Preliminary Treatment – Influent pumps, grinder, magnetic flow meter, grit chamber, and flow splitter

2. Walker Process concentric aeration basin, re-aeration basin, and final clarifiers (0.2 mgd)-Decommissioned.

3. Two extended aeration oxidation ditch basins with brush aerators and circular clarifiers (0.2 mgd each)

4. One extended aeration oxidation ditch basin with brush aerators and circular clarifier (0.4 mgd)

5. Two extended aeration Carousel® oxidation ditch basins (0.75 mgd capacity, permitted at 0.5 mgd each) with two 0.255 million gallon final clarifiers (0.75 mgd capacity each)

Head works screenings along with grit removed from the grit chamber are collected and hauled offsite for disposal. Effluent from the treatment process is conveyed to five infiltration ponds where the treated effluent percolates into the ground.

There are currently twelve (12) asphalt lined sludge drying beds and nineteen (19) permitted sand sludge drying beds at the site where waste activated sludge can be dried by evaporation. Due to odor problems in the past these drying beds are no longer used and all waste activated sludge is dewatered using a belt filter press and hauled offsite by a private contractor.

After the construction of RWWTP, bio-solids generated by the HWWTP treatment processes will be conveyed to the RWWTP for further treatment and disposal.

Desert Crest Wastewater Treatment Plant: The DCWWTP was incorporated into MSWD system when MSWD acquired the Desert Crest sewage system. The treatment plant accepts flow from the small Desert Crest sewer system, an isolated system located east of the main MSWD system.

The DCWWTP was initially operational with 0.09 mgd capacity in 1974. In 1984 the plant was expanded to provide a redundant treatment train. It now has a total capacity of 0.18 mgd but the actual operational rated capacity remains at 0.09 mgd because of the redundancy requirement. The DCWWTP was operating at 74% of its rated capacity during 2006 and has been determined that it will not be able to accept any additional flow in the future.

The current discharge requirements for the DCWWTP are:

1. Discharge permit rated capacity – 0.09 mgd
2. 5-day biological Oxygen Demand (BOD_5) – 30 mg/L 30-day arithmetic mean/ 45 mg/L 7-day arithmetic mean
3. Total Dissolved Solids (TDS) – not exceeding 400 mg/L over that contained in the community water supply (423 to 486 mg/L water supply TDS)
4. Conform to the US EPA designated 126 Priority Pollutants Limits
5. No discharge into surface waters

Desert Crest Treatment Process: The treatment plant currently treats wastewater using an extended aeration secondary treatment process. Major equipment at the DCWWTP includes:

1. Preliminary Treatment – Grinder, comminutor (off-line), Parshall flume, and gravity grit collection box
2. Two concentric oxidation ditch basins with brush aerators and two final clarifiers (0.09 mgd each)

Effluent from the treatment process is conveyed to three infiltration ponds where it percolates into the ground. Bio-solids and grit are discharged to four asphalt lined drying beds to dry by evaporation. Dried bio-solids and grit are hauled to the HWWTP for storage and final disposal.

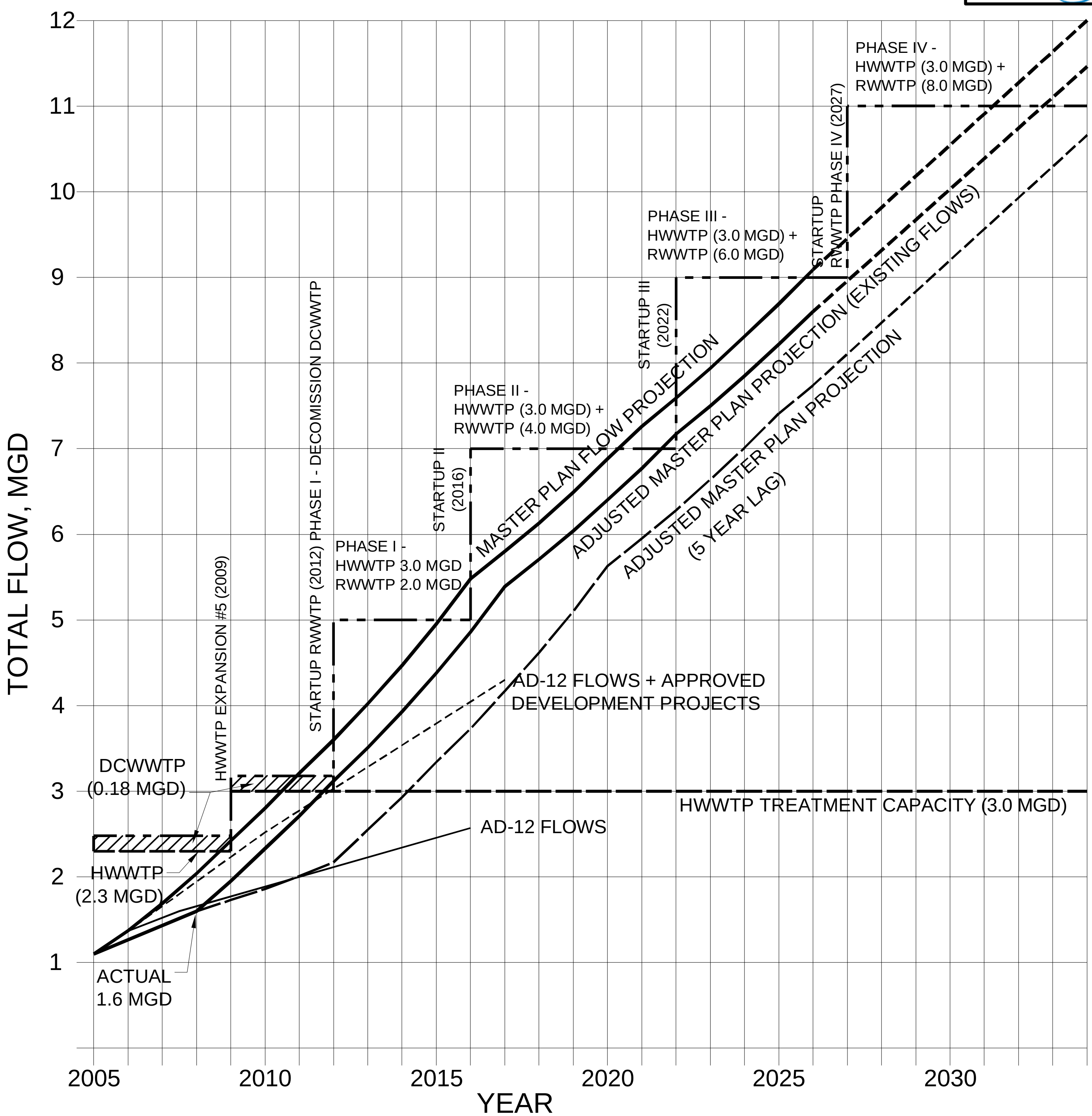
Because of its small size and high operational costs, it is planned that the DCWWTP will be decommissioned and flows routed to the HWWTP and RWWTP through a new interceptor sewer system when the Regional Wastewater Treatment Plant comes on-line.

5.0 DESIGN FLOWS AND LOADINGS

Projected wastewater flows for MSWD as defined in the Master Plan and Table 3.1 of this report are presented graphically in Figure 5-1. Also shown are the projected flows expected from Assessment District 12 (AD-12) together with anticipated flows to be generated by development projects which are presently approved and in development. With the current downturn in the economy, some of the planned developments and future developments have been delayed or may be deferred until more favorable economic conditions exist. A projection showing an additional 5-year lag in development has been shown. This situation should be watched closely and construction schedules adjusted accordingly.

Figure 5-1 also shows existing capacities of the HWWTP, with its anticipated expansion, and the DCWWTP. The present expansion of HWWTP is anticipated to come on line in 2008-2009. This will provide treatment capacity of 3.0 mgd. Because of odors generated from the treatment process and the close proximity of new developments around the plant site, it is anticipated that this will be the last expansion at this plant.

Based on the projected flows, it will be necessary to provide additional treatment capacity for MSWD by 2012. The Master Plan recommended that a new regional plant be constructed. The new Regional Wastewater Treatment Plant (RWWTP) will therefore need to come on line before 2012 in order to meet the projected treatment needs of the District. It is anticipated that when the RWWTP comes on line that the DCWWTP will be decommissioned and flows sent to the regional plant.



PROJECTED WASTEWATER FLOWS AND TREATMENT CAPACITIES

MISSION SPRINGS REGIONAL WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 5-1

It is recommended that the construction of the Regional Wastewater Treatment Plant (RWWTP) be divided into phases. This will prevent overbuilding of the facility initially and allow for additional expansions to be added as needed in the future.

The Master Plan recommended that the initial construction for the RWWTP provide treatment for 8.0 mgd based on the Master Plan's projected flows. A review of projections and current development pressure indicate that the initial phase (Phase I) could be reduced to at least 2.0 mgd in order to keep capital outlays to a minimum. Follow on expansions (Phases II to III) would be designed with Phase I and are set in 2.0 mgd increments to keep facility development in line with growth within the District. Development of Phases I through III would bring the total capacity to 6.0 mgd which should meet the Districts projected needs until beyond 2027. Depending on the development pressure in the area, the plant could then be expanded to either 8.0 mgd (Phase IV) or to 10.0 mgd (Phase V) at a later date. Although not being considered at this time the RWWTP could be easily expanded to treat a design ADF of 20.0 mgd (ultimate design capacity) and space allocations have been shown to reflect this.

Table 5.1 lists the anticipated RWWTP design flows and organic loadings for the three phases listed above and for the ultimate build out of the system. Also shown are the anticipated effluent requirements for the plant.

TABLE 5.1 – RWWTP DESIGN FLOWS AND LOADINGS

Parameter	Phase I Initial Phase II Phase III	Phase IV	Phase V	Ultimate Build Out (Double)
FLOW				
Average Daily Flow, mgd	2.0 4.0 6.0	8.0	10.0	20.0
Peak Hour Flow, mgd	4.0 8.0 12.0	16.0	20.0	40.0
INFLUENT (Max. Month)				
BOD_5, mg/L	300 300 300	300	300	300
BOD_5, lbs/day	5,003 10,006 15,010	20,000	25,020	50,040
TSS, mg/L (RWWTP)	325 325 325	325	325	325
TSS, lbs/day (RWWTP)	5,420 10,840 16,260	21,680	27,110	54,210
WAS TSS, lbs/day[1] (HWWTP)	5,210	5,210	5,210	5,210
Sum TSS, lbs/day	10,630 16,050 21,470	26,890	32,320	59,420
NH_4-N, mg/L	23 23 23	23	23	23
NH_4-N, lbs/day	500 1,000 1,500	2000	2500	5005
TKN, mg/L	30 30 30	30	30	30

TKN, lbs/day	1500	2000	2500	5005
EFFLUENT LIMITS				
BOD_5, mg/L	30	30	30	30
TSS, mg/L	30	30	30	30
NO_3-N, mg/L	<10	<10	<10	<10
Total Nitrogen TN, mg/L	10	10	10	10

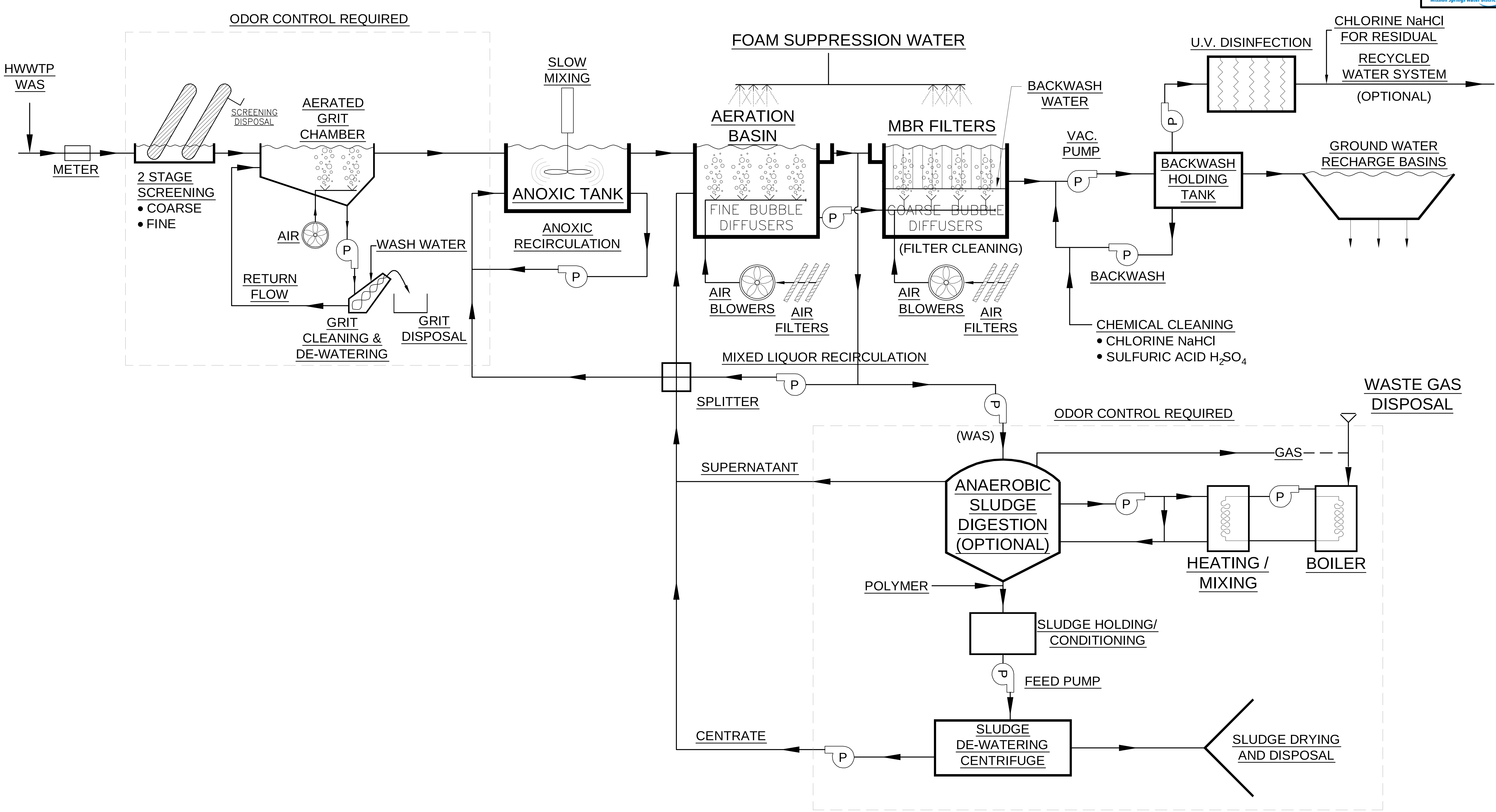
[1] Based on projected maximum month waste activated sludge discharge from HWWTP per HPDR-5, Section 4.4 adjusted for a flow of 3.0 mgd.(6600x3.0/3.8 = 5210).

6.0 REGIONAL WASTEWATER TREATMENT PLANT

RWWTP Process

Various treatment alternatives were discussed in the Master Plan. For preliminary planning purposes and space allocation an extended aeration process with membrane bio-rectors and anoxic denitrification is being considered. Figure 6.1 presents a general schematic for such a facility. The actual sizing and process selection will be developed in the Preliminary Design Report phase. The various design elements for this process includes:

1. Headworks
    a. Flow Metering
    b. Course and Fine Screening and disposal
    c. Grit removal, cleaning and disposal
    d. Conveyor system for screenings and grit transfer
2. Liquid Train
    a. Anoxic reaction tanks with recirculation
    b. Aeration basins with fine bubble diffusers
    c. Membrane bio-reactor Filters with vacuum pumps
    d. Mixed liquor recirculation
    e. Backwash holding tank
    f. Groundwater Recharge Basins



TREATMENT SCHEMATIC

MISSION SPRINGS REGIONAL WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 6-1

P:\16003\134-16003-08002\Cadd\EH-FLOW DIAGRAM-01.dwg Printed On: 08/08/2008 09:49 By: philip.tunnell

3. Optional Disinfection for recycled water system (If water is to be used outside the treatment plant)
    a. Ultraviolet Disinfection with sodium hypochlorite for residual
    b. Recycled water pump to pressurize the recycled water system.
4. Solids handling Train
    a. Waste activated sludge thickening (optional)
    b. Anaerobic or Aerobic Sludge Digestion (optional)
    c. Sludge holding/conditioning tank
    d. Sludge de-watering (centrifuge or filter press)
    e. Sludge drying (mechanical) and disposal
5. Odor Control areas
    a. Headworks
    b. Solids handling facilities (sludge thickening, optional sludge digestion, sludge dewatering, sludge drying and disposal)

Other facilities that would need to be located at the site to support the treatment process include:

1. Administration/Control Building
    a. Reception area
    b. Offices and Conference Rooms
    c. Plant process control laboratory

   d. Process Control Room/SCADA
   e. Dressing rooms/showers/restrooms
   f. Document/supply storage
   g. Parking for operators and visitors

2. Blower and Pump Building
   a. Aeration blowers
   b. Motor control centers for process pumps

3. Maintenance/Equipment Storage building
   a. Maintenance shop
   b. Parts and equipment storage

4. Standby power generation facilities (can be included with Blower and Pump building)
   a. Standby power generators
   b. Switch gear and controls
   c. Fuel storage

Layout Restrictions

The proposed site (see Figure 6-2) is located north of 20th Avenue and west of Little Morongo Road and consists of an 87.5 acre parcel of land running north to south approximately 990-feet wide by 3980 feet long excluding a 2.5 acre (330 x 330 feet) well site on the east side and shown in Figure 6.2. Total useable area is

SITE PLAN

SCALE: 1"=500'

MISSION SPRINGS REGIONAL
WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 6-2

P:\16003\134-16003-08002\Cadd\EH-SITE PLAN.dwg Printed On: 08/01/2008 08:13 By: philip.tunnell approximately 82.3 acres. There is also a major fault line running across the northern portion of this site which makes portions of the site unsuitable for construction.

The interceptor sewers proposed in the Master Plan are shown entering the site from the east and the west along 19th Avenue. To minimize pumping, it is recommended that the major treatment trains be kept south of 19th Avenue. This restricts the useable area for the treatment plant to approximately 54 acres.

To protect water sources, the State of California requires minimum separation of treatment facilities and water wells. Of major concern are the following minimum separations:

- 100 feet from Sewage Pump Stations
- 150 feet from Sewage Treatment Plants
- 500 feet from Sewage percolation/Evaporation Ponds

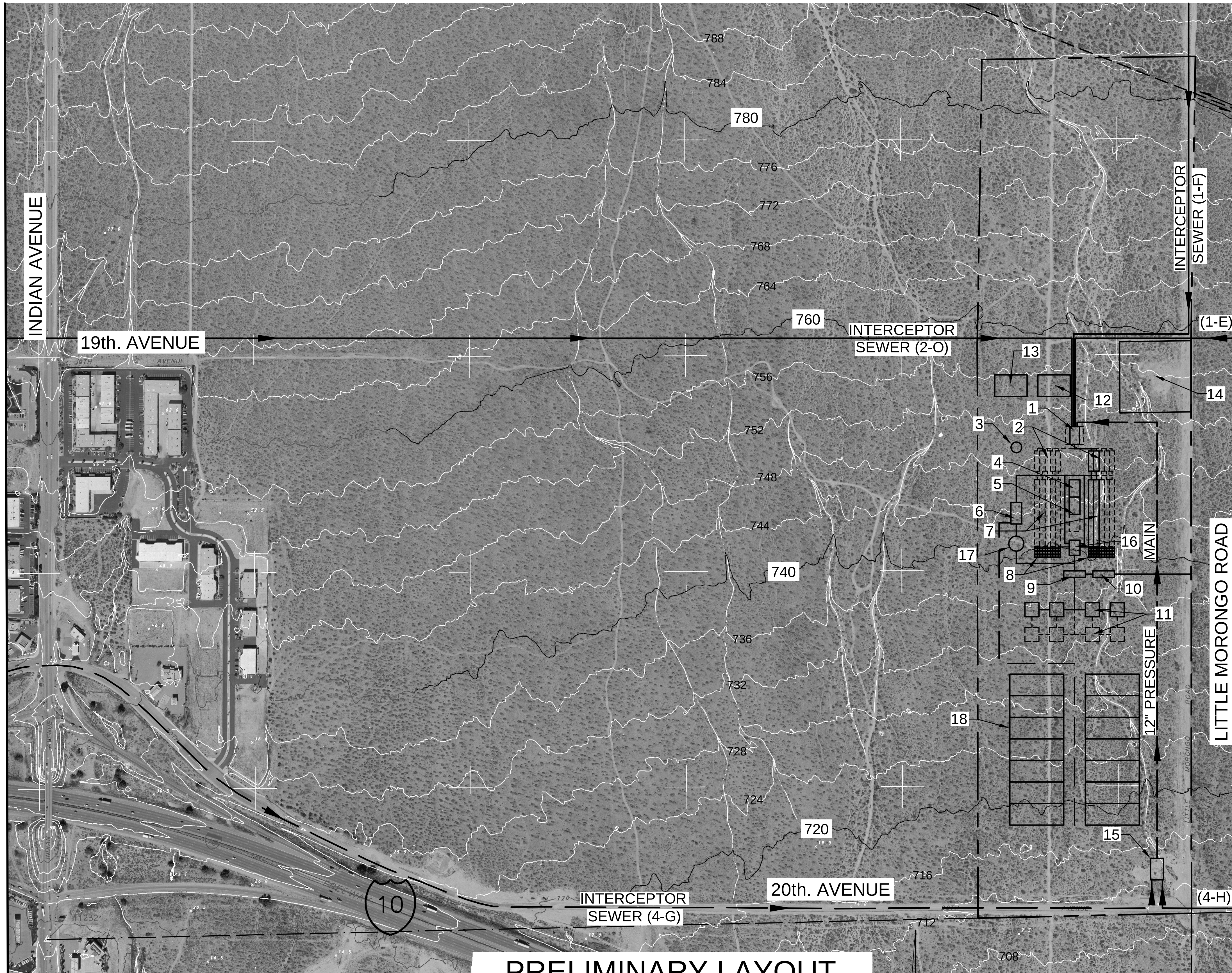
Area topography indicates that the site slopes uniformly from north to south at around 1.8 to 2.0-percent. It also shows an existing, natural storm drainage course traversing the length of the site from north to south. This will need to be relocated or channelized to avoid flooding the site.

Facility Sizing and Phasing

Due to the large size of the ultimate RWWTP (20 mgd) and the relatively small amount of wastewater currently being treated (1.6 mgd), the objective is to plan the treatment plant in the smallest practical increments. The time required to construct as compared to the projected wastewater flow increases during that time period must be considered when determining the smallest practical increment. For example, if it takes two and a half years to construct a phase, then the phase should accommodate at least the amount of flow that increases during that period. Otherwise construction of one phase would have to overlap with construction of the next phase. This could be difficult and costly. In two and a half years, the projections indicate a flow increase of 0.95 mgd. But due to the requirements of process redundancy, the initial phase would have to be designed for a nominal capacity of at least 1.5 mgd to 2 mgd, depending on design configuration. In setting the rated capacity of a wastewater treatment plant each of the plants redundant process elements is assumed to be off line for maintenance and the plant capacity rated accordingly.

Later construction phases would increase the rated plant capacity by the nominal capacity added. By constructing the plant in 2.0 mgd phases compared to 1.0 mgd phases there is also at least a 5 percent savings in cost realized due to the economies of scale.

Figure 6-3 and 6-4 present a preliminary layout for the system. Figure 6-4 gives an expanded view of the treatment process only. The layout shows the ultimate (20.0 mgd) plant divided into two separate 10.0 mgd treatment trains, one on each side of the common service structures. Each of these 10.0 mgd treatment trains is further divided into five (5) treatment or construction phases, each with a nominal capacity of 2.0 million gallon per day. Two mgd construction phases turn out to be a good multiple to work with. First, it divides the 10.0 mgd treatment train into workable modules for ease of duplication. Secondly, a size of 2.0 mgd meets



1. HEAD WORKS
2. ANOXIC STAGE
3. ODOR CONTROL
4. STANDBY POWER
5. BLOWER/ PUMP BLDG.
6. SLUDGE DEWATERING
7. AERATION BASINS
8. MBR FILTERS
9. RECIRCULATION BASIN
10. UV DISINFECTION
11. RECHARGE BASINS
12. SHOP/ MAINT. BLDG.
13. ADMIN. BLDG.
14. WELL 33 SITE
15. 1.6 MGD LIFT STATION - 50' TDH
16. PUMP FACILITY
17. SLUDGE HOLDING/CONDITIONING BEDS
18. TEMPORARY SLUDGE DRYING

PRELIMINARY LAYOUT

SCALE: 1"=500'

MISSION SPRINGS REGIONAL
WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 6-3

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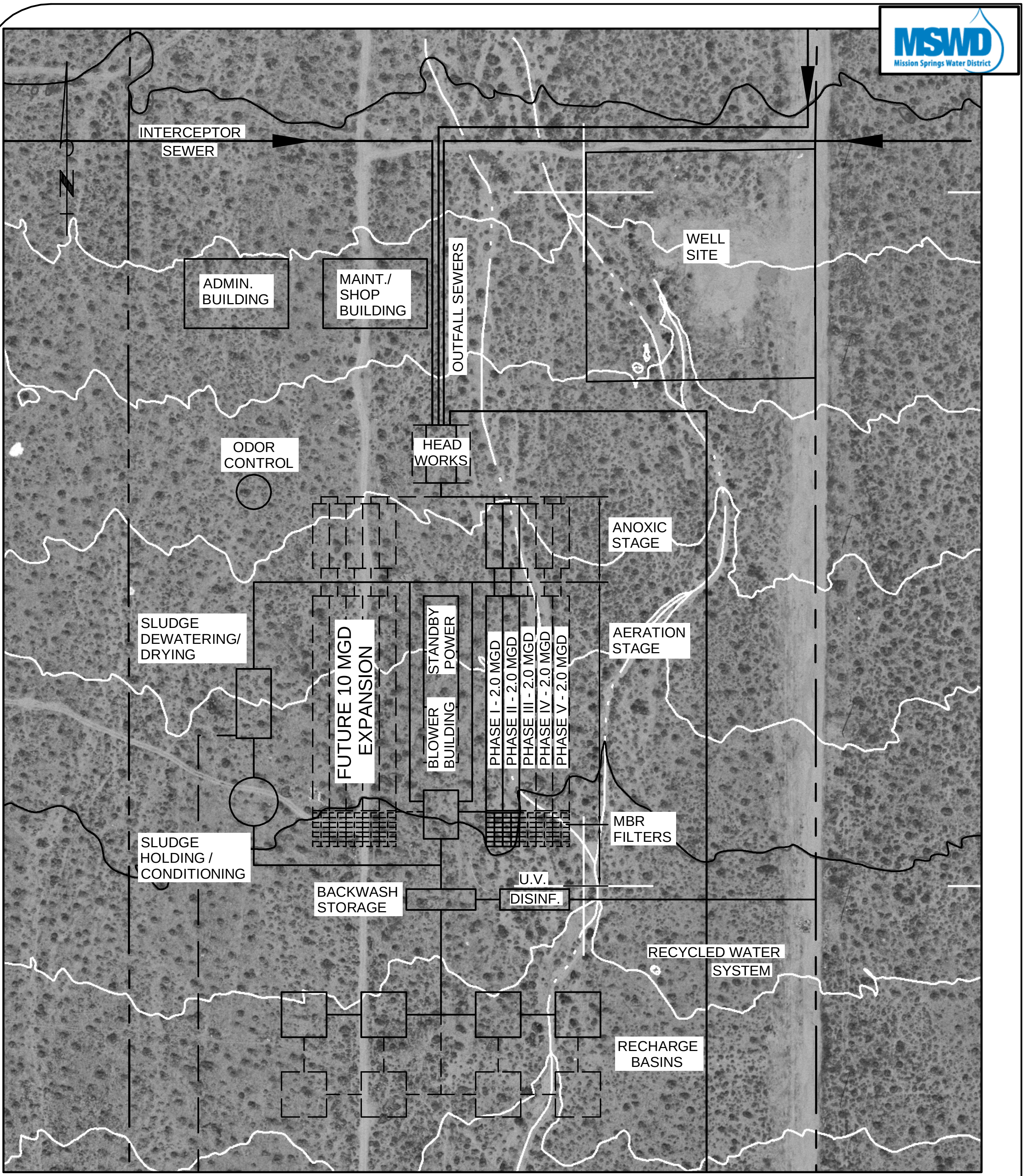


PRELIMINARY LAYOUT - TREATMENT PROCESS

MISSION SPRINGS REGIONAL
WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 6-4

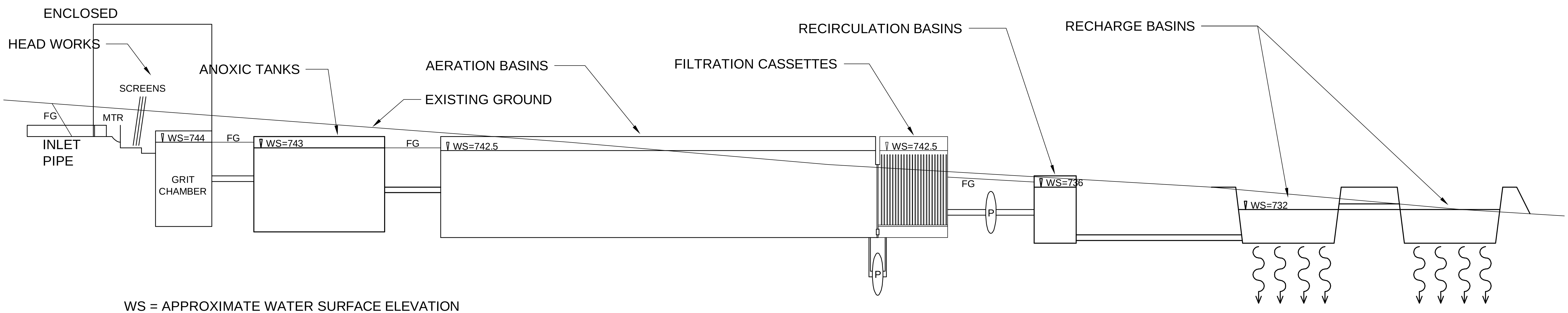
P:\16003\134-16003-08002\Cadd\EH-PRELIMINARY PLANT LAYOUT-DETAIL.dwg Printed On: 08/08/2008 09:54 By: philip.tunnell the projected increases in flow for approximately 5 to 7 years. This is approximately the time it takes to design, construct and bring on line the next construction phase. Also, because of requirements for process redundancy, the rated capacity of the first 2.0 mgd construction would be limited to 1.0 to 1.5 mgd depending on the final design configuration.

The initial phases (Phase I through Phase III) would construct a 6 mgd plant which would meet projected needs for the next 20 years. Limiting construction to the smaller 2.0 mgd phases helps keep construction in line with flow growth within the District without over building the plant.

Phases IV and V would follow after and each add an additional 2 mgd of capacity bringing the total plant capacity to 10.0 mgd.. These could be constructed as individual expansions like the first three phases or, if needed, constructed at the same time but only if development demands are high enough to warrent.

It is recommended that all three of the initial phases (Phase I through Phase III) be designed during Phase I design development. Expansion provisions for Phase IV and Phase V should also be incorporated in that design. This streamlines the future design and construction process.

Figure 6-5 indicates the hydraulic section through the plant. This reflects only an approximation because it is based only on approximate sizing of the facilities. The actual profile will depend on the specific process and head requirements to be developed in the Preliminary Design Report.



WS = APPROXIMATE WATER SURFACE ELEVATION
(TO BE DETERMINED IN DESIGN PHASE)

VERTICAL EXAGGERATION = 4
NOT TO SCALE

TYPICAL HYDRAULIC SECTION

MISSION SPRINGS REGIONAL
WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 6-5

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Process Features

Headworks: The head works of the plant is shown approximately 100-feet south of 19th Avenue. This places the plant away from the existing fault line at the north end of the site. The interceptor sewers are showing coming from the east and west along 19th Avenue and south along Little Morongo Road. If these can be kept shallow, the invert at the headworks could be at 6 to 7 feet below the existing ground elevation. If the interceptor sewers are too deep it might be necessary to construct a lift station along with the headworks facilities.

For sewer flows south of 19th Avenue, a small lift station (1.6 mgd) would be required. This could be located at 20th Avenue, at the southeast corner of the plant site. A 12-inch pressure line would deliver flows to the headworks.

Because of odors associated with the headworks operation, the screens, grit chamber, grit washing and disposal storage facilities should be housed in an enclosed structure and odor control facilities provided.

As wastewater enters the headworks the flows are continually measured and recorded. It would be advantageous to provide separate metering facilities on each of the major Interceptor sewers entering the plant. This would permit isolation of Infiltration/Inflow problems if they develop in the future. If a single meter is provided then the use of a replaceable flume is recommended for the primary flow measuring device. That way its size can be upgraded in the future to match higher wastewater flows without major structural modifications.

The wastewater would then pass through a bank of course and fine screens. A minimum of two units would be required initially with space to expand to three units in the future. An overflow bypass channel with a trash rack should also be provided for emergency use if the screens should become clogged during an emergency.

After screening the water enters the grit chambers. These could be circular (vortex) design or conventional rectangular aerated grit chamber design. It is anticipated that two units would be required to meet Phase I flows and provide redundancy. The initial units could be oversized to eliminate future expansion to 10 mgd. This would then be expanded to four basins for the ultimate capacity of 20 mgd.

Aerated grit chambers are usually designed for a two to five minute detention at peak hourly flows with a length to width ratio of 2.5:1 to 5:1. Air requirements are adjustable from 3 to 8 cubic feet per minute per foot of length. The grit slurry would be pumped from the chamber and then dewatered and cleaned using a cyclone classifier. Centrate and wash water would be returned to the grit chamber. Screenings and washed grit would be transferred via a conveyor system to holding bins to be hauled away for disposal at a landfill.

***Phase I Considerations*:**

- Channels and piping should be sized to accommodate design flows of 10.0 mgd. Ultimate expansion would require second 10.0 mgd parallel train.

- Primary measuring devices should be easily upgradeable to best monitor flow ranges. If individual monitoring of each sewer outfall is provided, design each for maximum design flow of that sewer.

- Provide a minimum of two bays of screens with total capacity of 6 mgd with space for expansion to one or both sides. Size screening conveyor system to match.

- Provide a minimum of two aerated grit chambers with associated grit washing and dewatering facilities-total capacity of 4.0 mgd . Provide ability to expand on one or both sides for ultimate design.

Anoxic Reactor: The anoxic reactor tank is the first stage in the treatment process. Arriving wastewater is mixed with mixed liquor from the aeration process and retained for about 1.75 hrs at ADF. Recirculation through the anoxic reactor should also be provided along with the mixed liquor for process flexibility and optimization.

Sufficient mechanical mixing is provided in the anoxic reactor to keep solids in suspension but not to aerate the mixture. This permits the facultative organisms to use the carbon source in the incoming waste water to remove nitrogen from the process liquid. It may also be necessary to add an additional carbon source such as citric acid to optimize the de-nitrification process.

Phase I Considerations:

- Width and configuration should match Aeration Tanks-total capacity of 2.0 mgd.

- Should have a minimum of two bays that can be dewatered separately.
- Provide for easy expansion of structure and appurtenances for up to 10.0 mgd capacity.
- Recycle piping sized for 10.0 mgd. Recycle pumps added with each phase.

Aerobic Aeration Tanks: After leaving the anoxic reactors the waste water and return activated sludge (RAS) mixture is aerated. The aeration basin should have a hydraulic retention time of around 6.5 to 8.0 hours based on ADF before passing to the membrane bio-reactor filters. Return activated sludge is recycled back to the head of the aeration basins and/or to the anoxic reactors. The RAS pump capacity should be adjustable up to 2 times the ADF. The return activated sludge system will operate with MLSS (mixed liquor suspended solids) of up to 9000 mg/L.

The aeration basins will be equipped with blower supplied fine bubble diffusers with the Oxygen Uptake Rate (OUR) expected be around 13 to 14 mg O_2/L/hr. The basins should also be equipped with a foam suppression spray system using product water to eliminate foam that builds up from the aeration process.

Phase I Considerations:

- Provide a minimum of two bays with total capacity of 2.0 mgd. Provide for separate dewatering.
- Air headers and recycle piping designed for 10.0 mgd. Pumps and compressors for 2.0 mgd with capability for expansion.

- Provide for easy expansion of structure and appurtenances for up to 10.0 mgd capacity.

MBR Filters: Process water is pumped into the bio-reactor filter chamber from the bottom in order to maintain a positive upward flow around the filters. This helps keep the filters free of solids build up. The Membrane Bio-reactor filters are equipped with suction pumps to maintain the required negative pressures to draw the filtrate through the filter membrane. The filters should be grouped and provided with valves and couplings for easy replacement without taking down entire banks of filters. Provisions should be made for cleaning air (coarse bubble aeration) and back flushing with chlorinated product water. Periodically basins will need to chlorinate at a higher concentration and allowed to stand to eliminate bacterial growth. Facilities for periodic acid treatment of the filters should also be provided.

Phase I Considerations:

- Provide a minimum of two bays so one can be taken down for maintenance. Each bay should be capable of processing the maximum daily flow for a 2.0 mgd plant.
- Provide couplings and appurtenances for easy removal of filter cassettes. Install only those necessary to handle existing flows. Keep others in storage for expansion and replacement.
- Provide suction pumps to match installed cassettes and existing flows.

- Design header piping for full 10.0 mgd plant with connections for expansion to future phases.

- Design recirculation basin for full 10.0 mgd capacity. Provide two cells for cleaning.

Infiltration Basins: Infiltration rates presented in the Geotechnical Investigation Report (GIR) prepared by Landmark Consultants, Inc. establish an infiltration rate of 50 gallons per hour per square foot at the RWWTP site. For an ultimate peak daily flow of 20.0 mgd, an infiltration area of only 16,700 square feet would be required (around 0.4 acres). For establishing site requirements a safety factor of 2 was used and basin sizes kept small. This permits their use to be rotated and the ponds to be cleaned on a regular basis to remove weeds and windblown fines. Basins should also be interconnected to permit overflow between infiltration basins.

The infiltration basins have been located at the south end of the site to maintain a minimum separation of 500 feet from the well site to conform to California drinking water separation standards. Treatment process facilities require only 150 feet of separation.

Phase I Considerations:

- Construct for full 10.0 mgd capacity divided into two trains of basins. Provide overflow piping to flow to next basin.
- Rotate use between basin trains to provide uniform use of basins and to provide for basin maintenance.

Solids Handling: Waste activated sludge (WAS) from the Horton Wastewater Treatment Plant (HWWTP) will be pumped into the interceptor sewer main and conveyed to the RWWTP where it will go through the treatment process again. This will increase the Total Suspended Solids entering the plant but should not cause any problems with the treatment process and may even improve it.

The plant WAS will be drawn off as needed to maintain the Mixed Liquor Suspended Solids (MLSS) in the return activate sludge (RAS) system at an optimum value. If necessary, the waste sludge from the treatment plant can be processed further by aerobic digestion or by anaerobic digestion. This reduces the volume of solids that need to be dewatered and transported to the disposal site. Rather than going through the additional digestion process, the WAS can also be sent directly to a sludge holding/conditioning tank prior to dewatering and drying and then to final disposal. The holding tank would need to have about 5-days storage.

The actual sludge handling process will need to be evaluated in the Preliminary Design Report in order to select the most cost effective alternative. For preliminary area planning purposes we are showing only a sludge dewatering/drying facility with no digestion. This would reduce the water content so the sludge cake would be 80 to 90% dry solids. This sludge dewatering facility would be constructed during Phase II or Phase III.

For Phase I we are recommending the system be operated in and extended aeration mode to provide some aerobic digestion and providing a series of sludge drying beds located south of the infiltration basins. This will reduce the initial capital outlay during this initial phase of development. As there is no immediate development around the treatment plant site in this area, the nuisance of related sludge drying odors for 5 to 10 years will have minimal impact. It also provides more time to evaluate the best solids handling process for this specific plant.

Phase I Considerations:

- Operate treatment plant in an extended aeration mode during the Phase I period to provide some aerobic digestion of sludge.
- Construct Sludge holding tank to provide for gravity thickening.
- Provide temporary sludge drying beds to be replace by future sludge dewatering facilities (Phase II or Phase III)

Odor Control: The headworks facilities and the sludge dewatering/drying facility are two areas where odors are likely to occur. Positive ventilation should be provided for both these facilities and the air sent to a single stage chemical scrubber for neutralization of the odor causing compounds. For planning purposes we have placed a central unit between the head works and the sludge dewatering/drying facilities. It may prove more cost effective to provide two smaller units at each of the locations rather than ducting it to a central location. This should be addressed in the Preliminary Design Report.

Phase I Considerations:

- Design air handling ducts for 10.0 mgd facility.
- Design odor control facilities for existing 2.0 mgd plant size but provide for easy expansion to 10.0 mgd

7.0 INTERCEPTOR SEWERS

Existing Collection System

There are currently two separate collection systems serving the district. A small system serves the Desert Crest community with the wastewater treated at the Desert Crest Wastewater Treatment Plant (DCWWTP). The major collection system serves the community of Desert Hot Springs and some of the surrounding unincorporated areas. This wastewater is treated at the Horton Wastewater Treatment Plant (HWWTP).

The existing collection systems are reviewed in depth in the Master Plan and a schedule of recommended improvements listed.

Proposed Interceptor Sewer System

In order to deliver wastewater to the new Regional Wastewater Treatment Plant (RWWTP) a system of new interceptor sewers was recommended. An initial interceptor would be constructed westerly along the southern boundary of the District from Desert Crest to the RWWTP and south along Little Morongo Road from Desert Hot Springs to the RWWTP. These lines would be completed by 2012 when the RWWTP comes on line and would take pressure of the HWWTP and allow the small DCWWTP to be decommissioned. Also waste activated sludge from the HWWTP would be discharged into the interceptor and transported to the new RWWTP for treatment and disposal.

Three future expansions of the interceptor sewer system would be constructed in three segments from 2012 to 2026 as the areas within the District are developed and as additional communities are provided with collection systems.

Figure 7-1 is extracted from Figure 2.10 of the Master Plan by URS and shows the locations of the proposed interceptors. Table 7.1 (extracted from Table 9-7 of the Master Plan) lists the proposed interceptor sewer line projects and sewer upgrade projects. Sewer upgrade projects are shown in bold type. Refer to Master Plan Table 9-7 for their costs.

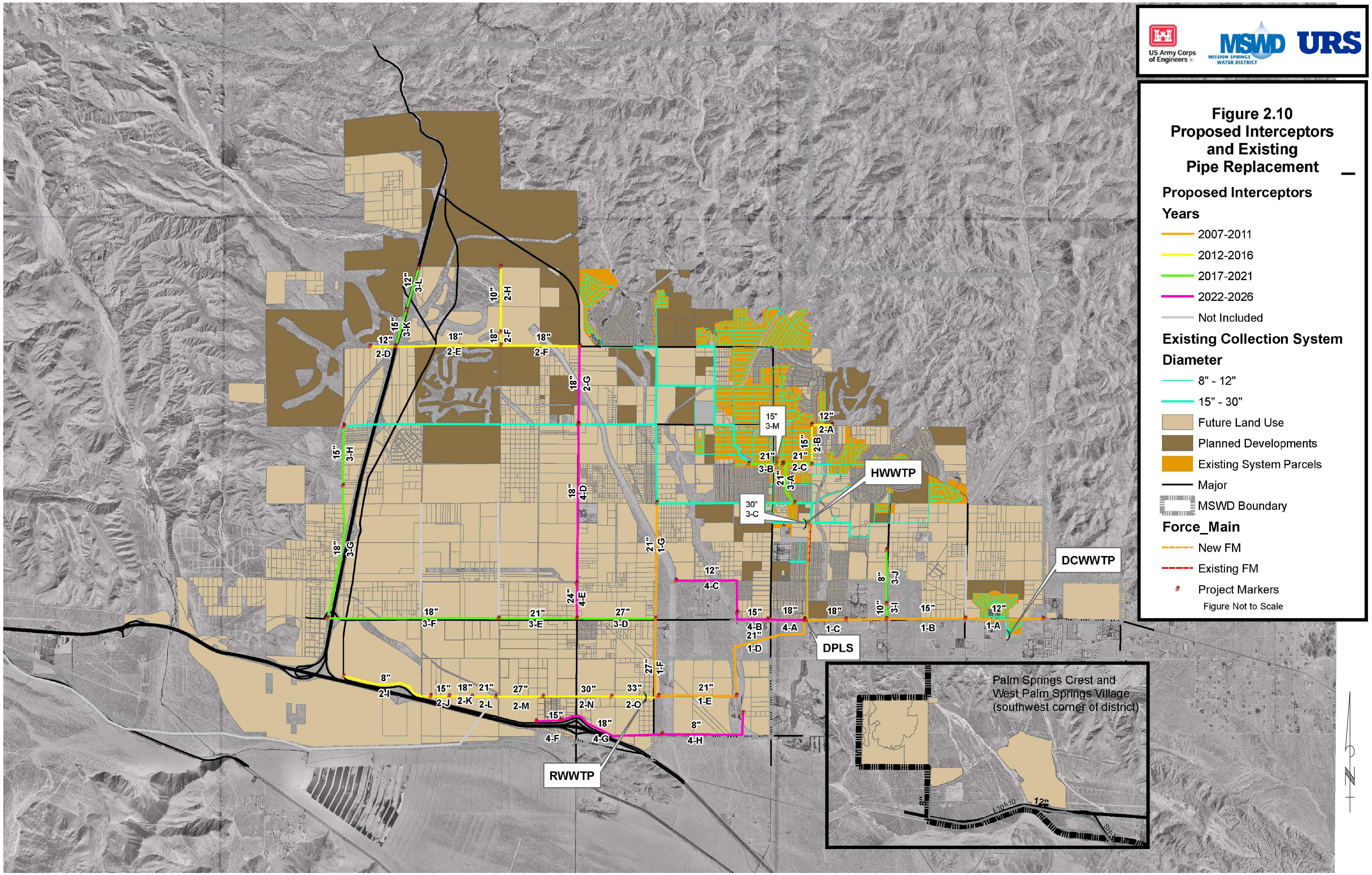
TABLE 7.1 – PROPOSED INTERCEPTOR SEWER PROJECTS

Project ID	**Length (ft)**	**Diameter (in)**	**Construction Dates**
1-A	5306	12	2008-2012
1-B	8140	15	2008-2012
1-C	2811	18	2008-2012
1-D	9284	18	2008-2012
1-E	5571	21	2008-2012
1-F	7656	27	2008-2012
1-G	5508	21	2008-2012
2-A	**1392**	**12**	**2012-2016**
2-B	**2700**	**15**	**2012-2016**

2-C	**1983**	**21**	**2012-2016**
2-D	1735	12	2012-2016
2-E	7176	18	2012-2016
2-F	5387	18	2012-2016
2-G	5321	18	2012-2016
2-H	4441	10	2012-2016
2-I	6359	8	2012-2016
2-J	1269	15	2012-2016
2-K	1557	18	2012-2016
2-L	1624	21	2012-2016
2-M	3230	27	2012-2016
2-N	4660	30	2012-2016
2-O	2942	33	2012-2016
3-A	**2893**	**21**	**2017-2021**
3-B	**2336**	**21**	**2017-2021**
3-C	**389**	**30**	**2017-2021**
3-D	4420	27	2017-2021
3-E	4517	21	2017-2021

3-F	11686	18	2017-2021
3-G	9074	18	2017-2021
3-H	4200	15	2017-2021
3-I	1034	10	2017-2021
3-J	3672	8	2017-2021
3-K	2579	15	2017-2021
3-L	3015	12	2017-2021
3-M	**322**	**15**	**2017-2021**
4-A	2504	18	2022-2026
4-B	2561	15	2022-2026
4-C	6339	12	2022-2026
4-D	10837	18	2022-2026
4-E	2415	24	2022-2026
4-F	1685	15	2022-2026
4-G	6824	18	2022-2026
4-H	7439	8	2022-2026

The proposed sewer project schedule and breakdown presented in Table 7.1 and in the Master Plan should be periodically adjusted on a regular basis to match changing development and expansion demands within the District.



FUTURE PIPING (FROM FIG. 2.10 07WWMP)

SCALE: NTS

MISSION SPRINGS REGIONAL WASTEWATER TREATMENT PLANT

TETRA TECH

Figure 7-1

P:\16003\134-16003-08002\Cadd\EH-PROPOSED INTERCEPTORS AND EXISTING PIPE REPLACEMENT.dwg Printed On: 08/01/2008 08:11 By: philip.tunnell

8.0 STRATEGIC PLAN RECOMMENDATIONS

Facility Development Process

This strategic plan is the second step in the facility development process which consists of the following four stages:

1. Prepare district wide Wastewater Master Plan (Completed)
2. Prepare Comprehensive Wastewater Facilities Strategic Plan (This document)
3. Project Design Phase
    a. Select project design engineer for specific project
    b. Prepare Preliminary Design Report
    c. Prepare Design Plans and Specifications
4. Project Construction Phase
    a. Bid Project
    b. Construct Project
    c. Train operators and staff
    d. Commission Project

Design, including engineer selection and approvals can take anywhere between 9 months for sewer design to 20 months for a treatment plant. This is dependent on the scope and complexity of the design. Construction will also vary depending on the size and complexity of the project. Including the bidding process, interceptor construction is projected for about 9 to 12 months depending on length of sewer being installed. This assumes installation of approximately 200 feet of sewer a day and at least two separate crews operating.

Construction for Phase I of the RWWTP may take around two years to complete. Again, this will depend on the actual scope, size, and amount of construction required. The actual construction durations should be established after the design process has been completed.

Phasing and Scheduling

The present expansion project at the Horton Wastewater Treatment Plant, together with the existing capacity of the Desert Crest Wastewater Treatment Plant, will give the District a design treatment capacity of 3.18 million gallons per day. Based on the flow projections in the Master Plan (see Figure 5-1), this would handle the treatment demand within the District until around 2012 to 2014. At that time the initial construction phase (Phase I) of the Regional Wastewater Treatment Facility would need to be on line to meet the additional treatment demands within the District. This would require preliminary design development on the RWWTP and the Regional Interceptor sewer to start as soon as possible. Construction of the Regional Wastewater Treatment Facility-Phase I through Phase III each have a design capacity of 2.0 million gallons per day. This will permit the District to better match its construction program with the flow demands over the next 20 years. Because of the size of the project and its complexity, it may require more that one year to complete the initial design of the facility and two years to complete the construction of Phase I. This will push the projected

2012-2014 startup date for Phase I of the RWWTP. Subsequent 2.0 mgd expansions would then occur every four (4) to eight (8) years, as based on the flow projections in Figure 5-1, or as the total Average Daily Flows within the District approach 80% of existing design treatment capacity.

The Development Schedule shown in Figure 8.1 shows a detailed breakdown of the various tasks and activities required within the strategic plan. Because Expansion 5 at the HWWTP is presently underway, no attempt has been made to provide a detailed breakdown of that project.

Table 8.1 summarizes in tabular form the facility strategic plan development schedule shown in Figure 8-1. These show the RWWTP and the Regional Interceptor sewer being designed and constructed concurrently but not necessarily by the same persons. Both projects are inter-related and need to both be completed in order to use the Regional Wastewater Treatment Plant. Because the interceptor sewers cover such a widespread geographical area and because there is significant float time as to when they need to be operational, the interceptors could easily be bid as several smaller contracts or could be constructed incidental to subdivision development.

It is recommended that RWWTP Phase I through Phase III be designed and ready for construction as needed without any modifications. This permits the District to track flows and start the next construction phase when the design flow approach 80-percent of the total design treatment capacity. This prevents initial over building of the treatment plant. Some of the initial facilities such as piping and headworks are more cost effective to construct to meet total design flows, and will

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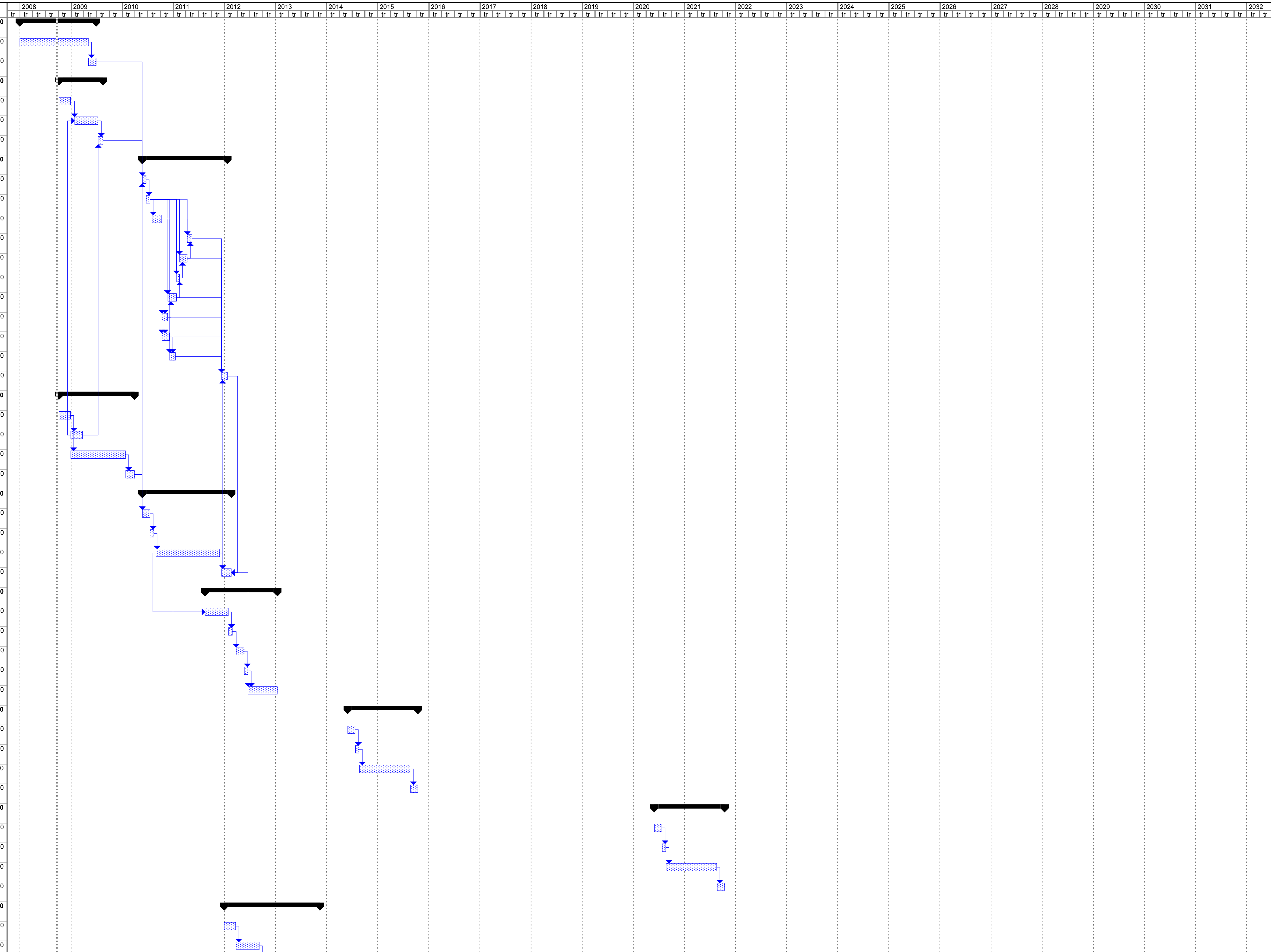
FIGURE 8-1
DEVELOPMENT SCHEDULE AND COST LOADINGS

ID	Task Name	Duration	Start	Finish	% Comp.	Cost
1	**HWWTP Expansion 5**	**390 days**	**Wed 1/2/08**	**Tue 6/30/09**	**0%**	**$20,000,000.00**
2	Design/Construction	70 wks	Wed 1/2/08	Tue 5/5/09	0%	$19,800,000.00
3	Commissioning	8 wks	Wed 5/6/09	Tue 6/30/09	0%	$200,000.00
4	**Design Interceptors 1A-1G**	**225 days**	**Wed 10/8/08**	**Tue 8/18/09**	**0%**	**$3,827,900.00**
5	Select Engineer	12 wks	Wed 10/8/08	Tue 12/30/08	0%	$18,000.00
6	Project Design	24 wks	Wed 1/28/09	Tue 7/14/09	0%	$3,789,900.00
7	Approvals 1A-1G	5 wks	Wed 7/15/09	Tue 8/18/09	0%	$20,000.00
8	**Const. Interceptors 1A-1G**	**435 days**	**Wed 5/26/10**	**Tue 1/24/12**	**0%**	**$23,514,220.00**
9	Advertise/Bid	4 wks	Wed 5/26/10	Tue 6/22/10	0%	$20,000.00
10	Award Contract(s)	4 wks	Wed 6/23/10	Tue 7/20/10	0%	$10,000.00
11	Mobilization/Materials	10 wks	Wed 8/4/10	Tue 10/12/10	0%	$1,175,700.00
12	Construct 1A	5 wks	Wed 4/13/11	Tue 5/17/11	0%	$1,730,540.00
13	Construct 1B	8 wks	Wed 2/16/11	Tue 4/12/11	0%	$3,277,150.00
14	Construct 1C	3 wks	Wed 1/26/11	Tue 2/15/11	0%	$1,345,570.00
15	Construct 1D	9 wks	Wed 11/24/10	Tue 1/25/11	0%	$4,426,830.00
16	Construct 1E	6 wks	Wed 10/13/10	Tue 11/23/10	0%	$3,090,580.00
17	Construct 1F	8 wks	Wed 10/13/10	Tue 12/7/10	0%	$5,412,220.00
18	Construct 1G	6 wks	Wed 12/8/10	Tue 1/18/11	0%	$2,970,130.00
19	Transfer Flows to RWWTP	6 wks	Wed 12/14/11	Tue 1/24/12	0%	$55,500.00
20	**Design RWWTP Phase I-III**	**385 days**	**Wed 10/8/08**	**Tue 3/30/10**	**0%**	**$19,170,000.00**
21	Select Engineer Phase I-III	12 wks	Wed 10/8/08	Tue 12/30/08	0%	$20,000.00
22	Prepare PDR Phase I-III	12 wks	Wed 12/31/08	Tue 3/24/09	0%	$4,030,000.00
23	Prepare Plans/Specifications	56 wks	Wed 12/31/08	Tue 1/26/10	0%	$15,090,000.00
24	Approvals Phase I-III	9 wks	Wed 1/27/10	Tue 3/30/10	0%	$30,000.00
25	**Const. RWWTP Phase I**	**455 days**	**Wed 5/26/10**	**Tue 2/21/12**	**0%**	**$39,290,000.00**
26	Advertise/Bid-Phase I	8 wks	Wed 5/26/10	Tue 7/20/10	0%	$25,000.00
27	Award Contract-Phase I	4 wks	Wed 7/21/10	Tue 8/17/10	0%	$15,000.00
28	Construction-Phase I	65 wks	Wed 9/1/10	Tue 11/29/11	0%	$38,500,000.00
29	Commissioning-Phase I	10 wks	Wed 12/14/11	Tue 2/21/12	0%	$750,000.00
30	**Decommission DCWWTP**	**370 days**	**Wed 8/17/11**	**Tue 1/15/13**	**0%**	**$515,500.00**
31	Prepare Decom Plans/Specs	24 wks	Wed 8/17/11	Tue 1/31/12	0%	$62,170.00
32	Approvals	4 wks	Wed 2/1/12	Tue 2/28/12	0%	$10,000.00
33	Advertise/Bid	8 wks	Wed 3/28/12	Tue 5/22/12	0%	$15,000.00
34	Award Contract	4 wks	Wed 5/23/12	Tue 6/19/12	0%	$5,000.00
35	Construction/Demolition	30 wks	Wed 6/20/12	Tue 1/15/13	0%	$423,330.00
36	**Construc. RWWTP Phase II**	**360 days**	**Mon 6/2/14**	**Fri 10/16/15**	**0%**	**$29,140,000.00**
37	Advertise/Bid-Phase II	8 wks	Mon 6/2/14	Fri 7/25/14	0%	$25,000.00
38	Award Contract-Phase II	4 wks	Mon 7/28/14	Fri 8/22/14	0%	$15,000.00
39	Construction-Phase II	52 wks	Mon 8/25/14	Fri 8/21/15	0%	$29,000,000.00
40	Commissioning-Phase II	8 wks	Mon 8/24/15	Fri 10/16/15	0%	$100,000.00
41	**Construc. RWWTP Phase III**	**360 days**	**Mon 6/1/20**	**Fri 10/15/21**	**0%**	**$28,640,000.00**
42	Advertise/Bid-Phase III	8 wks	Mon 6/1/20	Fri 7/24/20	0%	$25,000.00
43	Award Contract-Phase III	4 wks	Mon 7/27/20	Fri 8/21/20	0%	$15,000.00
44	Construction-Phase III	52 wks	Mon 8/24/20	Fri 8/20/21	0%	$28,500,000.00
45	Commissioning-Phase III	8 wks	Mon 8/23/21	Fri 10/15/21	0%	$100,000.00
46	**D/C Interceptors 2A-2Q**	**490 days**	**Mon 1/2/12**	**Fri 11/15/13**	**0%**	**$19,250,290.00**
47	Select Engineeer	12 wks	Mon 1/2/12	Fri 3/23/12	0%	$18,000.00
48	Project Design	24 wks	Mon 3/26/12	Fri 9/7/12	0%	$2,657,040.00



Project: CWWFSP Schedule
Date: Thu 9/18/08

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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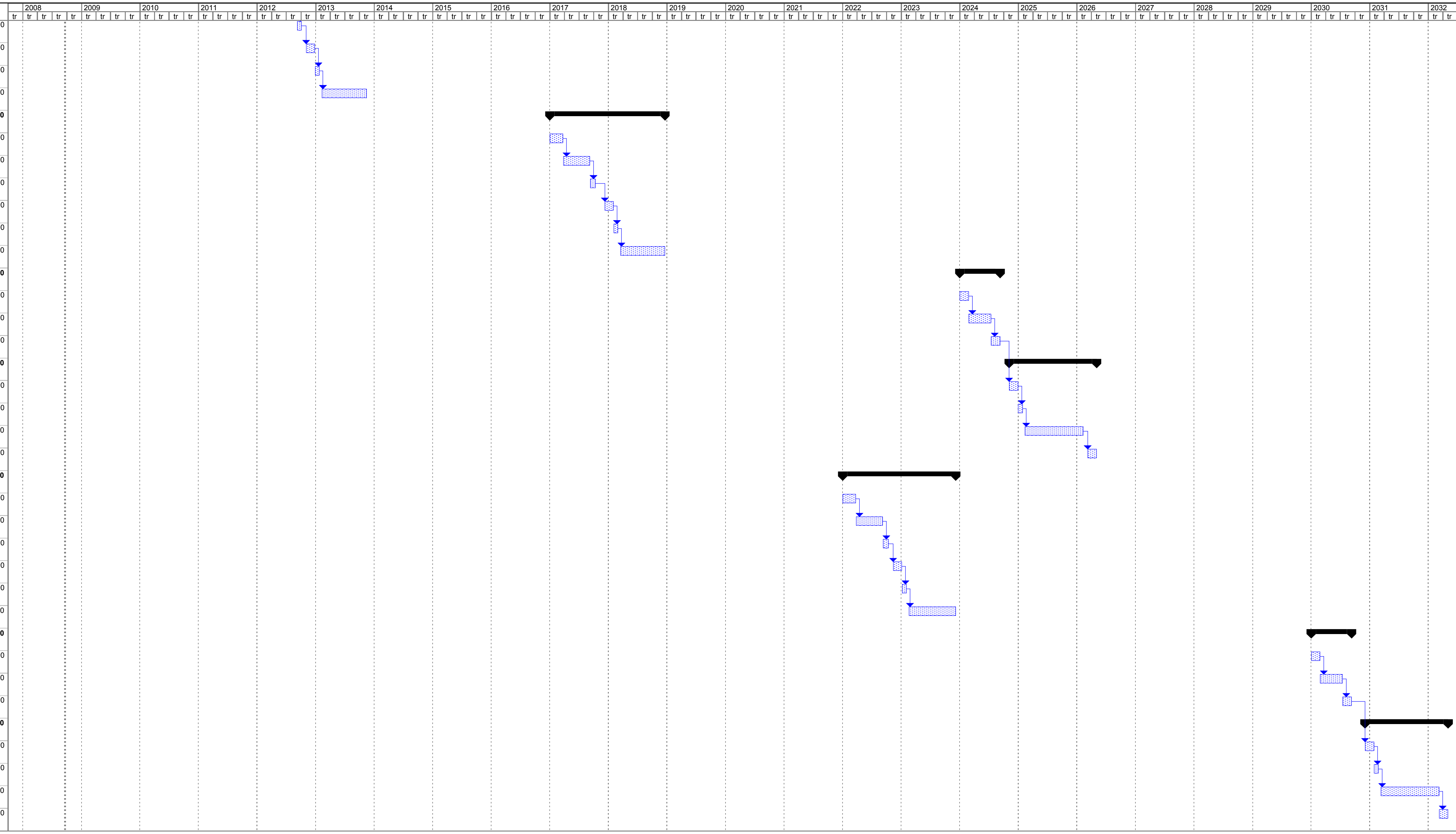
FIGURE 8-1
DEVELOPMENT SCHEDULE AND COST LOADINGS

ID	Task Name	Duration	Start	Finish	% Comp.	Cost
49	Approvals	4 wks	Mon 9/10/12	Fri 10/5/12	0%	$20,000.00
50	Advertise/Bid	8 wks	Mon 11/5/12	Fri 12/28/12	0%	$20,000.00
51	Award Contract	4 wks	Mon 12/31/12	Fri 1/25/13	0%	$10,000.00
52	Construction 2A-2Q	40 wks	Mon 2/11/13	Fri 11/15/13	0%	$16,525,250.00
53	**D/C Interceptors 3A-3M**	**515 days**	**Mon 1/2/17**	**Fri 12/21/18**	**0%**	**$25,494,120.00**
54	Select Engineeer	12 wks	Mon 1/2/17	Fri 3/24/17	0%	$18,000.00
55	Project Design	24 wks	Mon 3/27/17	Fri 9/8/17	0%	$3,531,180.00
56	Approvals	5 wks	Mon 9/11/17	Fri 10/13/17	0%	$20,000.00
57	Advertise/Bid	8 wks	Mon 12/11/17	Fri 2/2/18	0%	$20,000.00
58	Award Contract	4 wks	Mon 2/5/18	Fri 3/2/18	0%	$10,000.00
59	Construction	40 wks	Mon 3/19/18	Fri 12/21/18	0%	$21,894,940.00
60	**Design RWWTP Phase IV**	**180 days**	**Wed 1/3/24**	**Tue 9/10/24**	**0%**	**$5,952,000.00**
61	Negotiate Design Services	8 wks	Wed 1/3/24	Tue 2/27/24	0%	$10,000.00
62	Update Design	20 wks	Wed 2/28/24	Tue 7/16/24	0%	$5,922,000.00
63	Approvals	8 wks	Wed 7/17/24	Tue 9/10/24	0%	$20,000.00
64	**Const. RWWTP Phase IV**	**390 days**	**Wed 11/6/24**	**Tue 5/5/26**	**0%**	**$28,740,000.00**
65	Advertise/Bid-Phase IV	8 wks	Wed 11/6/24	Tue 12/31/24	0%	$25,000.00
66	Award Contract-Phase IV	4 wks	Wed 1/1/25	Tue 1/28/25	0%	$15,000.00
67	Construction-Phase IV	52 wks	Wed 2/12/25	Tue 2/10/26	0%	$28,200,000.00
68	Commissioning-Phase IV	8 wks	Wed 3/11/26	Tue 5/5/26	0%	$500,000.00
69	**D/C Interceptors 4A-4G**	**505 days**	**Mon 1/3/22**	**Fri 12/8/23**	**0%**	**$20,354,500.00**
70	Select Engineeer	12 wks	Mon 1/3/22	Fri 3/25/22	0%	$18,000.00
71	Project Design	24 wks	Mon 3/28/22	Fri 9/9/22	0%	$2,811,630.00
72	Approvals	5 wks	Mon 9/12/22	Fri 10/14/22	0%	$20,000.00
73	Advertise/Bid	8 wks	Mon 11/14/22	Fri 1/6/23	0%	$20,000.00
74	Award Contract	4 wks	Mon 1/9/23	Fri 2/3/23	0%	$10,000.00
75	Construction	42 wks	Mon 2/20/23	Fri 12/8/23	0%	$17,474,870.00
76	**Design RWWTP Phase III**	**180 days**	**Thu 1/3/30**	**Wed 9/11/30**	**0%**	**$5,510,000.00**
77	Negotiate Design Services	8 wks	Thu 1/3/30	Wed 2/27/30	0%	$10,000.00
78	Update Design	20 wks	Thu 2/28/30	Wed 7/17/30	0%	$5,480,000.00
79	Approvals	8 wks	Thu 7/18/30	Wed 9/11/30	0%	$20,000.00
80	**Const. RWWTP Phase III**	**370 days**	**Thu 12/5/30**	**Wed 5/5/32**	**0%**	**$28,640,000.00**
81	Advertise/Bid	8 wks	Thu 12/5/30	Wed 1/29/31	0%	$25,000.00
82	Award Contract	4 wks	Thu 1/30/31	Wed 2/26/31	0%	$15,000.00
83	Construction	52 wks	Thu 3/13/31	Wed 3/10/32	0%	$28,100,000.00
84	Commissioning	8 wks	Thu 3/11/32	Wed 5/5/32	0%	$500,000.00



Project: CWWFSP Schedule
Date: Thu 9/18/08

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline be needed to serve all plant phases, thus Phase I will be more expensive than subsequent construction phases. By the time Phase II and Phase III are implemented and follow on Phases IV and V are required, some of the facilities constructed for earlier phases will be in need of replacement so the budgets have been modified accordingly.

RWWTP Phase IV and RWWTP Phase V would also each expand the treatment capacity by 2.0 mgd. If the development demand and need for treatment expands more rapidly than projected, it might be more cost effective to construct both of these phases at the same time, expanding the treatment capacity by 4.0 mgd. On the other hand if development slows significantly the expansion projects can be deferred to a later date. It is recommended that Phases I through V all be integrated into a single design. This would be more cost effective and the design would be ready for implementation with only slight modifications to reflect improvements in materials and process and to provide for replacement of older equipment. It would also save the time for selecting a new engineer and preparing new designs for future expansions.

TABLE 8.1 – FACILITY DEVELOPMENT SECHEDULE

ID No. (Fig. 8.1)	Event/Activity	Trigger	Projected Dates
1	HWWTP Expansion 5 Improvements	In process	2008-2009
4*	Design Interceptor Segments 1-A through 1-G • Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month)	HWWTP Completion	2008-2009 10/08 – 12/08 1/09 – 7/09 8/09
8	Construct Interceptor Segments 1-A through 1-G • Bid (2-months) • Construction (Phased) • Transfer flows (2-months)	Complete Design	2010-2012 5/10 – 7/10 7/10 – 5/11 3/12 – 5/12
20	RWWTP Phase I to III-Design • Select Engineer (3-months) • Project Design (14-months) • Approvals (2-months)	District ADF = 2.3 mgd	2008-2010 10/08 – 12/08 12/08 – 1/10 1/10 – 4/10
25*	RWWTP Phase I-Construction • Bid (2-months) • Construction (17-months) • Commissioning (2-months)	Design Complete	2010-2012 5/10 – 8/10 9/10 –11/11 12/11 – 2/12
30	Decommission DCWWTP • Design and Construction	RWWTP Completion	2011 - 2013
36	RWWTP Phase II-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	District ADF = 4.0 mgd	2014-2015 To be determined in future
41	RWWTP Phase III-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	District ADF = 5.6 mgd	2020-2021 To be determined in future
46	Design and Construct Interceptor Segments 2-A through 2-O • Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month) • Bid (2-months) • Construction (6-months)	RWWTP Completion	2012-2013 To be determined in future
53	Design and Construct Interceptor Segments 3-A through 3-M	Segments 2 Complete	2017-2018

	• Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month) • Bid (2-months) • Construction (6-months)		To be determined in future
60**	RWWTP Phase IV-Design Update • Update Design (5-months) • Approvals (2-months)	District ADF = 7.6 mgd	2022
64	RWWTP Phase IV-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	Design Complete	2022-2024 To be determined in future
69	Design and Construct Interceptor Segments 4-A through 4-G • Select Engineer (3-months) • Project Design (6-months) • Approvals (1-month) • Bid (2-months) • Construction (6-months)	Segments 3 Complete	2022-2023 To be determined in future
76**	RWWTP Phase V-Design Update • Update Design (5-months) • Approvals (2-months)	District ADF = 9.8 mgd	2028
80	RWWTP Phase V-Construction • Bid (2-months) • Construction (12-months) • Commissioning (2-months)	Design Complete	2029-2030 To be determined in future
N/A	Future RWWTP Expansions (10.0 to 20.0 mgd)	When ADF reaches around 80% total plant capacity	To be determined in future

* RWWTP Phase I and Interceptor Sewer (Segment 1) construction to be concurrent. Activate interceptor at completion of RWWTP.

** Phase IV and V design completed in conjunction with Phase I through III design but will require updating to reflect changes in operation. If growth warrants, Phase IV and Phase V construction could be done at the same time.

9.0 PROJECTED COSTS

Figure 8.1 also presents the cost loadings for the various project elements. Project element costs were extracted from those estimates developed in the 2007 Wastewater Master Plan (07 WWMP) and modified by cross checking with EPA MCD-37 extrapolated to 2008 and with a 30% contingency. Costs were also increased to reflect the escalation of costs between June 2007 and June 2008 as based on the published changes to the Engineering News Record Construction Cost Index (ENR CCI) for the Los Angeles area. The costs in 07 WWMP reflected total project costs and included all design, management, administrative and contingency costs related to the project. To reallocate these costs presented in Figure 8.1, the cost model shown in Table 9.1 was used.

TABLE 9.1 – PROJECT COST MODEL

Activity	Phase	Based on Construction Costs	Based on Total Costs
Construction Costs including estimating contingencies	C	1.00	0.67
Agency Costs (During Design)	D	0.05	0.03
Agency Costs (During Construction- including Construction Management)	C	0.12	0.08
Engineering Design Services	D	0.10	0.07
Geotechnical Services	D	0.03	0.02
Surveying	D	0.03	0.02
Engineering Construction Services	C	0.05	0.03
Project/Construction Contingencies	C	0.12	0.08
TOTAL PROJECT		1.50	1.00

Phase: D=Design, C=Construction

Construction Costs: This includes all costs related to the actual construction of the project such as materials, equipment, labor overhead and profit. It also includes an estimating contingency of 20-percent.

Agency Costs: Costs incurred by the district for administration, bidding, legal services and quality control are included in this item.

Design Services: These are the contracted professional service costs required for development of the required project design.

Engineering Construction Services: This includes the engineering support services required during construction of the project such as reviewing submittals, attending meetings, resolving design problems and inspection/quality control tasks.

Project/Construction Contingencies: These contingency allocations are separate from the design related contingencies and cover items like changes in project scope and resolution unforeseen conflicts and changes requested by the District.

Two models are provided in Table 9.1. The first allocates or assigns costs on the basis of the project construction costs. The second allocates costs based on the total project cost.

Table 9.2 provides a summary of project costs in increments of five years ending in 2010, 2015, 2020, 2025 and 2030 which reflects the cost loadings as presented in Figure 8.1. It should be noted that these costs are based on projected development growth and could be modified with changes in development pressure. Although we are half way through the first five year increment ending in 2010 there is still significant cost outlays that can be expected to meet the projected wastewater treatment and sewerage needs of the District.

Note also in Table 9.2 that the design costs listed in Line No. 20 is for RWWTP Phases I through III. Construction for these phases is then shown in Lines No. 25, 36 and 41.

TABLE 9.2 - PROJECT COST SUMMARY (Present through 2035)

Line No.	Project	Present thru 2010	2011 thru 2015	2016 thru 2020	2021 thru 2025	2026 thru 2030	2031 thru 2035	Total Costs
1	*HWWTP Expansion 5	$20,000,000						$20,000,000
4	Design Interceptors 1A-1G	$3,827,900						$3,827,900
8	Const. Interceptors 1A-1G	$14,637,000	$8,877,300					$23,514,300
20	Design RWWTP Phases I-III	$19,170,000						$19,170,000
25	Const. RWWTP Phase I	$10,146,900	$29,143,100					$39,290,000
30	Decommission DCWWTP		$515,500					$515,500
36	Const. RWWTP Phase II		$29,140,000					$29,140,000
41	Const. RWWTP Phase III			$7,131,500	$21,508,500			$28,640,000
46	Design/Construct Interceptors 2A-2Q		$19,250,290					$19,250,290
53	Design/Construct Interceptors 3A-3M			$25,494,120				$25,494,120
60	Design RWWTP Phase IV				$5,952,000			$5,952,000
64	Const. RWWTP Phase IV				$25,142,600	$3,594,400		$28,737,000
69	Design/Construct Interceptors 4A-4G				$20,354,500			$20,354,500
76	Design RWWTP Phase V					$5,510,000		$5,510,000
80	Const. RWWTP Phase V					$12,500	$28,627,500	$28,640,000
	FIVE YEAR TOTALS	**$67,781,800**	**$86,926,190**	**$32,625,620**	**$72,957,600**	**$9,116,900**	**$28,627,500**	**$298,035,610**

* Existing project

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