

Sewer Authority Mid-Coastside

Recycled Water Project

Status Update

November 18, 2009



SAM Recycled Water Committee Meeting

SAM Recycled Water Project

Project implementation on three parallel paths:

- Recycled Water Facilities Planning Study by SRT Consultants
- Recycled Water Pilot Testing by SAM staff
- Recycled Water Project Management by SAM staff

Objectives and Purpose

- Recycled Water (RW) Project Objectives established by SAM Board:
 - Fast-track Implementation Schedule
 - Cost-effective Implementation Alternative
 - Prepare for State, Federal and other Funding
 - Ensure Future Expandability
- RW Facilities Planning Study (FPS) Purpose
 - Position the RW Project for State & Federal Funding
 - Develop a Plan for RW Project Implementation

RW FPS Status

- Milestones achieved (in under 6 months) since Board authorization on May 25, 2009:
 - RW FPS is 75% complete
 - Water Board mid-course review completed
 - SAM received favorable comments
 - Continued work on Financial Analysis and Implementation Plan
 - RW FPS scheduled for completion by end of 2009 (one year ahead of State schedule)

SAM Board Requests

- At the October 26, 2009 Board meeting, SAM Board requested the following information:
 - RW Project Critical-Path-Method (CPM) Implementation Schedule
 - Detailed Probable RW Project Costs
 - List of Treatment Technology Manufacturers
 - Sand Filtration and Membrane Filtration Comparison Matrix

Funding Overview

- Federal Grant Funding
- State Grant and Low-Interest Loan Funding
- Local Grant Funding
 - SFPUC
 - BAWSCA
- Member Agency Revenue

CEQA Overview

California Environmental Quality Act - CEQA

- Negative Declaration (ND) - if the Initial Study (IS) shows that the project would **avoid** effects
- Mitigated Negative Declaration (MND) - if the IS shows that the project would **mitigate** effects
- Environmental Impact Report (EIR) is prepared if effects cannot be mitigated

NEPA Overview

National Environmental Policy Act - NEPA

- Federal funding requires review under NEPA
- NEPA requires preparation of an Environmental Assessment (EA)
- Finding No Significant Impact (FONSI) is prepared if the EA concludes **no** significant impacts will occur
- Environmental Impact Statement (EIS) is required if EA finds significant impacts

Permitting Overview

Treatment Facility Permitting

- Coastal Development Permit
 - City of HMB
- Recycled Water Permit must be acquired jointly with the customer(s) – CCWD or others
 - Department of Public Health
 - Regional Water Quality Control Board

Implementation Schedule

- Traditional Schedule
 - CEQA/NEPA: Full EIR/EIS
 - Permitting
 - Traditional Design/Bid/Build Construction
- Fast-Track Schedule
 - CEQA/NEPA: MND/FONSI
 - Permitting
 - Turnkey Design/Build Contract
- SAM will most likely be in between the two

Fast-Track Schedule

	Name	Duration ¹	Start	Finish	Predecessors	2009 Half 1, 2010 Half 2, 2011 Half 1, 2011 Half 2																							
						N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A		
1	Project Management, Administrative & Legal Activities	440 days	11/23/09	8/4/11		[Gantt bar from 11/23/09 to 8/4/11]																							
2	SAM Board Approves Project Management Contract	1 day	11/23/09	11/23/09		[Gantt bar at 11/23/09]																							
3	Task 1 Recycled Water Project Alternative Selection	1 day	1/25/10	1/25/10		[Gantt bar at 1/25/10]																							
4	Subtask 1.1 SAM Board Selects RW Project Alternative for Implementation	1 day	1/25/10	1/25/10		[Gantt bar at 1/25/10]																							
5	Task 2 Environmental Review	131 days	1/25/10	7/26/10		[Gantt bar from 1/25/10 to 7/26/10]																							
6	Subtask 2.1 SAM Board Approval of CEQA/NEPA Consultant Contract	1 day	1/25/10	1/25/10	4SS	[Gantt bar at 1/25/10]																							
7	Subtask 2.2 CEQA/NEPA Review	120 days	1/26/10	7/12/10	6	[Gantt bar from 1/26/10 to 7/12/10]																							
8	Subtask 2.3 SAM Board Certifies CEQA/NEPA Document ²	1 day	7/26/10	7/26/10	7	[Gantt bar at 7/26/10]																							
9	Task 3 Permitting²	100 days	4/1/10	8/18/10		[Gantt bar from 4/1/10 to 8/18/10]																							
10	Subtask 3.1 Prepare Permit Applications	20 days	4/1/10	4/28/10		[Gantt bar from 4/1/10 to 4/28/10]																							
11	Subtask 3.2 Permit Applications Review	80 days	4/29/10	8/18/10	10	[Gantt bar from 4/29/10 to 8/18/10]																							
12	Task 4 Recycled Water Project Funding	131 days	2/22/10	8/23/10		[Gantt bar from 2/22/10 to 8/23/10]																							
13	Subtask 4.1 State Funding	131 days	2/22/10	8/23/10		[Gantt bar from 2/22/10 to 8/23/10]																							
14	Subtask 4.1.1 SAM Board Resolution to Apply for SRF Loan	1 day	2/22/10	2/22/10		[Gantt bar at 2/22/10]																							
15	Subtask 4.1.2 SAM Board Approves Consultant to Develop SRF Application	1 day	2/22/10	2/22/10		[Gantt bar at 2/22/10]																							
16	Subtask 4.1.3 State Loan Funding Application Development and Review	120 days	2/23/10	8/9/10	15	[Gantt bar from 2/23/10 to 8/9/10]																							
17	Subtask 4.1.4 SAM Board Approves State Funding Agreement	1 day	8/23/10	8/23/10	11	[Gantt bar at 8/23/10]																							
18	Subtask 4.2 Federal Funding	41 days	2/22/10	4/20/10		[Gantt bar from 2/22/10 to 4/20/10]																							
19	Subtask 4.2.1 SAM Board Approves Contract to Develop Title XVI Study	1 day	2/22/10	2/23/10		[Gantt bar at 2/22/10]																							
20	Subtask 4.2.2 Title XVI Study Development for Federal Funding	40 days	2/23/10	4/20/10	19	[Gantt bar from 2/23/10 to 4/20/10]																							
21	Task 5 Design and Construction of Recycled Water Facility: Turnkey (accelerated)	399 days	1/25/10	8/4/11		[Gantt bar from 1/25/10 to 8/4/11]																							
22	Subtask 5.1 SAM Board Approves Consultant to Develop Fast-Track RFP	1 day	1/25/10	1/25/10	4SS	[Gantt bar at 1/25/10]																							
23	Subtask 5.2 Develop RFP for Design/Build Contractor	39 days	1/26/10	3/19/10	22	[Gantt bar from 1/26/10 to 3/19/10]																							
24	Subtask 5.3 SAM Board Approves RFP Package	1 day	3/22/10	3/22/10	23	[Gantt bar at 3/22/10]																							
25	Subtask 5.4 Receive Design/Build Proposals	1 day	5/24/10	5/24/10	24	[Gantt bar at 5/24/10]																							
26	Subtask 5.5 Design/Build Contractor Selection Process	40 days	5/25/10	7/19/10	25	[Gantt bar from 5/25/10 to 7/19/10]																							
27	Subtask 5.6 SAM Board Approves Design/Build Contractor	1 day	7/26/10	7/26/10	26	[Gantt bar at 7/26/10]																							
28	Subtask 5.7 Notice to Proceed to Design/Build Contractor	1 day	8/23/10	8/23/10	27	[Gantt bar at 8/23/10]																							
29	Subtask 5.8 Design/Build Contractor 50% Design Submittal	1 day	10/25/10	10/25/10	28	[Gantt bar at 10/25/10]																							
30	Subtask 5.9 SAM Staff Review of 50% Design Submittal	20 days	10/26/10	11/22/10	29	[Gantt bar from 10/26/10 to 11/22/10]																							
31	Subtask 5.10 SAM Staff Approval of 50% Design Submittal	1 day	11/23/10	11/23/10	30	[Gantt bar at 11/23/10]																							
32	Subtask 5.11 Equipment Fabrication and Delivery	80 days	11/24/10	3/15/11	31	[Gantt bar from 11/24/10 to 3/15/11]																							
33	Subtask 5.12 Notice to Proceed with Construction	1 day	3/16/11	3/16/11	32	[Gantt bar at 3/16/11]																							
34	Subtask 5.13 Construction and Construction Management	80 days	3/17/11	7/6/11	33	[Gantt bar from 3/17/11 to 7/6/11]																							
35	Subtask 5.14 Tertiary Treatment Facility Startup	20 days	7/7/11	8/3/11	34	[Gantt bar from 7/7/11 to 8/3/11]																							
36	Subtask 5.15 Project Complete	1 day	8/4/11	8/4/11	35	[Gantt bar at 8/4/11]																							

Traditional Schedule

	Name	Duration	Start	Finish	Predecessors	2010				2011				2012				2013			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	Project Management, Administrative & Legal Activities	1,025.87...	11/23/09	10/28/13		[Gantt bar spanning from Q4 2009 to Q4 2013]															
2	SAM Board Approves Project Management Contract	1 day	11/23/09	11/24/09		[Gantt bar from Q4 2009 to Q1 2010]															
3	Task 1 Recycled Water Project Alternative Selection	1 day	1/25/10	1/25/10		[Gantt bar from Q1 2010 to Q1 2010]															
4	Subtask 1.1 SAM Board Selects RW Project Alternative for Implementation	1 day	1/25/10	1/25/10		[Gantt bar from Q1 2010 to Q1 2010]															
5	Task 2 Environmental Review	261 days	1/25/10	1/24/11		[Gantt bar from Q1 2010 to Q4 2010]															
6	Subtask 2.1 SAM Board Approval of CEQA/NEPA Consultant Contract	1 day	1/25/10	1/25/10	4SS	[Gantt bar from Q1 2010 to Q1 2010]															
7	Subtask 2.2 CEQA/NEPA Review	240 days	1/26/10	12/27/10	6	[Gantt bar from Q1 2010 to Q4 2010]															
8	Subtask 2.3 SAM Board Certifies CEQA/NEPA Document	1 day	1/24/11	1/24/11	7	[Gantt bar from Q4 2010 to Q1 2011]															
9	Task 3 Permitting	100 days	1/25/11	6/13/11		[Gantt bar from Q1 2011 to Q2 2011]															
10	Subtask 3.1 Prepare Permit Applications	20 days	1/25/11	2/21/11	8	[Gantt bar from Q1 2011 to Q2 2011]															
11	Subtask 3.2 Permit Applications Review	80 days	2/22/11	6/13/11	10	[Gantt bar from Q2 2011 to Q3 2011]															
12	Task 4 Recycled Water Project Funding	342 days	2/22/10	6/14/11		[Gantt bar from Q1 2010 to Q2 2011]															
13	Subtask 4.1 State Funding	342 days	2/22/10	6/14/11		[Gantt bar from Q1 2010 to Q2 2011]															
14	Subtask 4.1.1 SAM Board Resolution to Apply for SRF Loan	1 day	2/22/10	2/22/10		[Gantt bar from Q1 2010 to Q1 2010]															
15	Subtask 4.1.2 SAM Board Approves Consultant to Develop SRF Application	1 day	2/22/10	2/22/10	14SS	[Gantt bar from Q1 2010 to Q1 2010]															
16	Subtask 4.1.3 State Loan Funding Application Development and Review	120 days	2/23/10	8/9/10	15	[Gantt bar from Q1 2010 to Q3 2010]															
17	Subtask 4.1.4 SAM Board Approves State Funding Agreement	1 day	6/14/11	6/14/11	11	[Gantt bar from Q2 2011 to Q2 2011]															
18	Subtask 4.2 Federal Funding	41 days	2/22/10	4/19/10		[Gantt bar from Q1 2010 to Q2 2010]															
19	Subtask 4.2.1 SAM Board Approves Contract to Develop Title XVI Study	1 day	2/22/10	2/22/10	14SS	[Gantt bar from Q1 2010 to Q1 2010]															
20	Subtask 4.2.2 Title XVI Study Development for Federal Funding	40 days	2/23/10	4/19/10	19	[Gantt bar from Q1 2010 to Q2 2010]															
21	Task 5 Design of Recycled Water Facility: Design/Bid/Build (traditional)	227 days	6/14/11	4/25/12		[Gantt bar from Q2 2011 to Q4 2011]															
22	Subtask 5.1 SAM Board Approval of Design Consultant	1 day	6/14/11	6/14/11	17SS	[Gantt bar from Q2 2011 to Q2 2011]															
23	Subtask 5.2 10% Design Submittal	40 days	6/15/11	8/9/11	22	[Gantt bar from Q2 2011 to Q3 2011]															
24	Subtask 5.3 SAM Staff Review of 10% Design Submittal	15 days	8/10/11	8/30/11	23	[Gantt bar from Q3 2011 to Q3 2011]															
25	Subtask 5.4 50% Design Submittal	60 days	8/31/11	11/22/11	24	[Gantt bar from Q3 2011 to Q4 2011]															
26	Subtask 5.5 SAM Staff Review of 50% Design Submittal	15 days	11/23/11	12/13/11	25	[Gantt bar from Q4 2011 to Q4 2011]															
27	Subtask 5.6 90% Design Submittal	60 days	12/14/11	3/6/12	26	[Gantt bar from Q4 2011 to Q1 2012]															
28	Subtask 5.7 SAM Staff Review of 90% Design Submittal	15 days	3/7/12	3/27/12	27	[Gantt bar from Q1 2012 to Q1 2012]															
29	Subtask 5.8 Final Design Submittal	20 days	3/28/12	4/24/12	28	[Gantt bar from Q1 2012 to Q2 2012]															
30	Subtask 5.9 SAM Board Approval of Bid Documents	1 day	4/25/12	4/25/12	29	[Gantt bar from Q2 2012 to Q2 2012]															
31	Task 6 Bidding	61 days	4/26/12	7/19/12		[Gantt bar from Q2 2012 to Q3 2012]															
32	Subtask 6.1 Advertise Bids	60 days	4/26/12	7/18/12	30	[Gantt bar from Q2 2012 to Q3 2012]															
33	Subtask 6.2 SAM Board Approval of Construction Contractor	1 day	7/19/12	7/19/12	32	[Gantt bar from Q3 2012 to Q3 2012]															
34	Task 7 Construction of Recycled Water Facility	301 days	9/3/12	10/28/13		[Gantt bar from Q3 2012 to Q4 2013]															
35	Subtask 7.1 Notice to Proceed to Contractor	1 day	9/3/12	9/3/12	33	[Gantt bar from Q3 2012 to Q3 2012]															
36	Subtask 7.2 Substantial Completion	180 days	9/4/12	5/13/13	35	[Gantt bar from Q3 2012 to Q2 2013]															
37	Subtask 7.3 Construction Completion	120 days	5/14/13	10/28/13	36	[Gantt bar from Q2 2013 to Q4 2013]															

Acceleration Considerations

Considerations for Project Acceleration & Cost Reduction include:

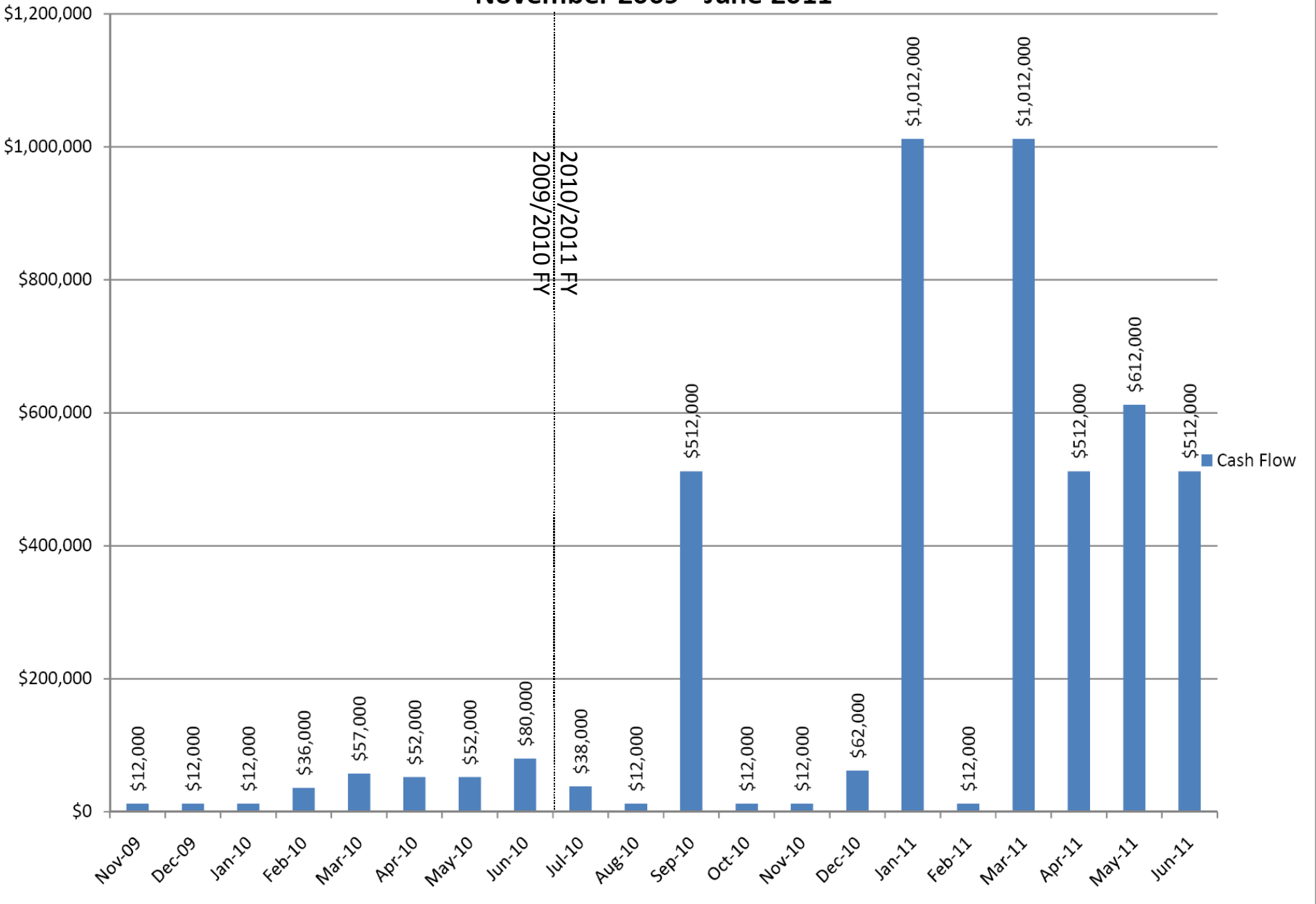
- Fast-Track Turnkey Implementation Method
- Develop Design/Build Contractor RFP based on:
 - Required footprint
 - Future Expandability
 - Price
 - Delivery Schedule
- Equipment Vendor Pre-Qualification

Acceleration (cont.)

- Begin CEQA/NEPA Review process now
 - Determine RW Facility Capacity & Footprint
- Reformat FPS in accordance with Title XVI Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 Guidelines to prepare for Federal Funding
- Start discussions with the City of HMB Planning regarding the CDP requirements and timelines
- Submit State Revolving Fund Loan application

Recycled Water Project Cash Flow

November 2009 - June 2011



Key Issues

Project's progress is highly dependent on the following key issues:

- Board's and Member Agencies' desires and preparedness to:
 - Make significant policy decisions in Jan. '10
 - Commit to advance funds (over \$300,000 this FY) now
- Desire and ability to quickly reach agreement with CCWD and/or OCP

Key Issues (cont.)

- The timelines presented are based on the policy and funding decisions by the Board as soon as at the Nov. 2009 and Jan. 2010 meetings
- Timelines assume that SAM is the CEQA Lead Agency for the treatment facility only; creek crossing is assumed to be responsibility of others
- Clarity is needed on who shall be Lead Agency for overall project financing, including grants and loans

Probable RW Project Costs

- Probable RW Project Costs based:
 - 0.8 MGD Facility Size
 - Treatment Process Options:
 - Sand Filtration
 - Membrane Filtration
 - Sample Sensitivity Analysis based on amounts of RW produced vs. RW sold to customers
 - No grant funding included
 - Actual costs will vary

0.8 MGD Tertiary Treatment Facility at SAM WWTP Cost Summary

Description	Cost, dollars		Comments
	Sand Filtration	Membrane Filtration	
Modifications to existing WWTP facilities	\$195,000	\$195,000	
Secondary Effluent Pump Station	\$102,000	\$136,000	
WWTP Yard Piping, Valving, and Sitework	\$520,000	\$192,000	
Tertiary Effluent Pump Station	\$100,000	\$100,000	
UV Disinfection	\$450,000	\$450,000	
Coagulation/Flocculation/Filtration/Chemical Addition	\$1,200,000	-	incl. Gypsum for OCP
Membrane Filtration	-	\$2,350,000	incl. Gypsum for OCP
Subtotal	\$2,567,000	\$3,423,000	
<i>Estimating Contingency @ 25%</i>	\$641,750	\$855,750	
<i>Total Probable Construction Cost</i>	\$3,208,750	\$4,278,750	
<i>Administrative, Legal, Planning, Design, Project and Construction Management @ 40%</i>	\$1,283,500	\$1,711,500	
Total Probable Project Cost (Present Worth)	\$4,492,250	\$5,990,250	
<i>Annualized Project Costs</i>	\$292,464	\$389,990	
<i>Estimated Operations & Maintenance Annual Costs</i>	\$178,232	\$192,837	
Total Annual Costs	\$470,696	\$582,827	
<i>OCP Reported Annual Demand, acre-feet per year</i>	300	300	reported by OCP
<i>Dollars per Acre-Foot Produced on Annual Basis – Treatment Only</i>	<i>\$1,569</i>	<i>\$1,943</i>	<i>based on 300 ac-ft/yr for OCP only</i>

Sample Sensitivity Analysis

Description	Cost, dollars		Comments
	Sand Filtration	Membrane Filtration	
Cost per Acre-Foot/year at 400 acre-feet/year demand	\$1,177	\$1,457	
Cost per Acre-Foot/year at 500 acre-feet/year demand	\$941	\$1,166	
Cost per Acre-Foot/year at 600 acre-feet/year demand	\$784	\$971	
Cost per Acre-Foot/year at 700 acre-feet/year demand	\$672	\$833	
Cost per Acre-Foot/year at 800 acre-feet/year demand	\$588	\$729	
Facility Design Capacity, million gallons per year	240	240	300 days/year operation
Facility Design Capacity, acre-feet per year	720	720	300 days/year operation
<i>Dollars per Acre-Foot Produced on Annual Basis – Treatment Only</i>	<i>\$654</i>	<i>\$809</i>	<i>based on 720 ac-ft/yr sold to customers</i>

Funding Sources

- Federal Grant Funding
- State Grant and Low-Interest Loan Funding
- Local Grant Funding
 - SFPUC
 - BAWSCA
- Member Agency Revenue

RW Project Management

- Currently performed by SAM staff, including the following Project components:
 - Pilot Test day-to-day oversight, data collection, and management
 - Project coordination with CCWD
 - All other project activities
- Dedicated Project Management Team is needed to ensure timely and cost-effective RW Project implementation

SRT Consultants offers:

- Project Management team focused on project implementation
- Focus on cost-effective solutions
- Track record of successful project delivery:
 - Expedited permitting
 - Funding procurement support
 - Collaboration with recycled water industry experts



Service Responsiveness Teamwork

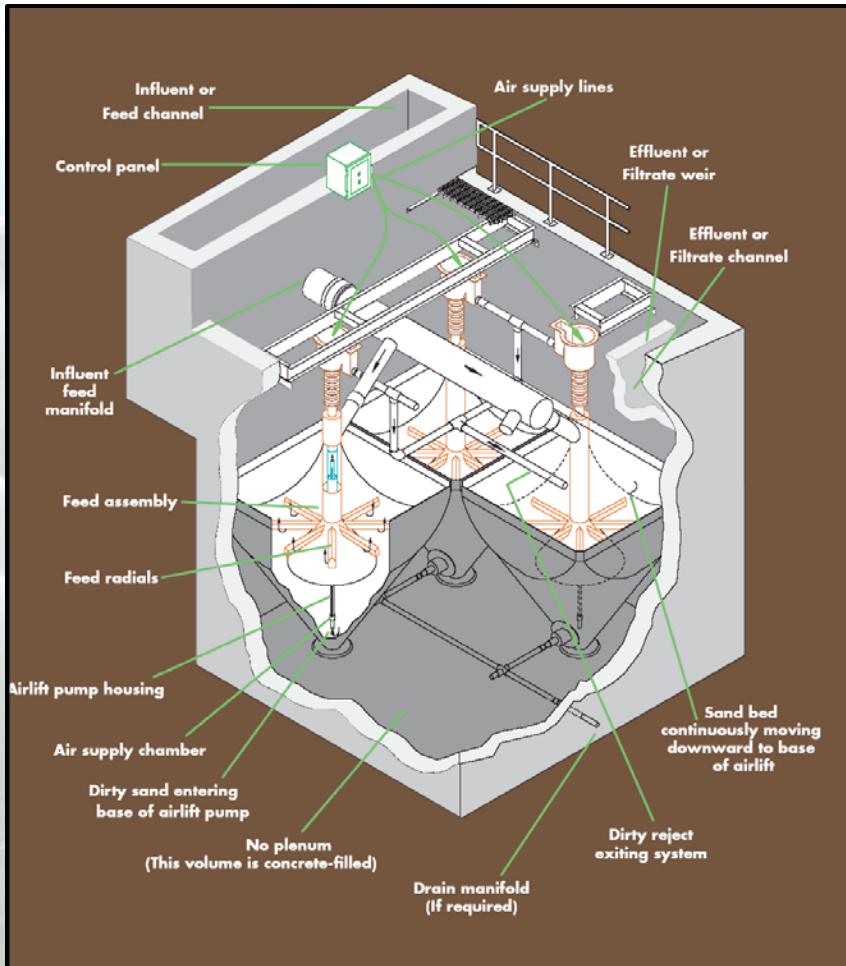
SRT's principal and senior project managers have over 100 years of combined experience in planning design, and construction management of water and wastewater treatment plants, water distributions systems, pump stations, reservoirs and storage tanks, wastewater collection systems, outfalls, and other facilities.



Treatment Technology Manufacturers

- Sand Filtration (SF)
 - DynaSand by Parkson Corporation
 - Gravisand by Siemens Water Technologies
 - AquaABF by Aqua Aerobics Systems
- Membrane Filtration (MF)
 - Siemens Water Technologies
 - PALL Corporation
 - Parkson Corporation
 - DOW Corporation

Sand Filtration



Membrane Filtration



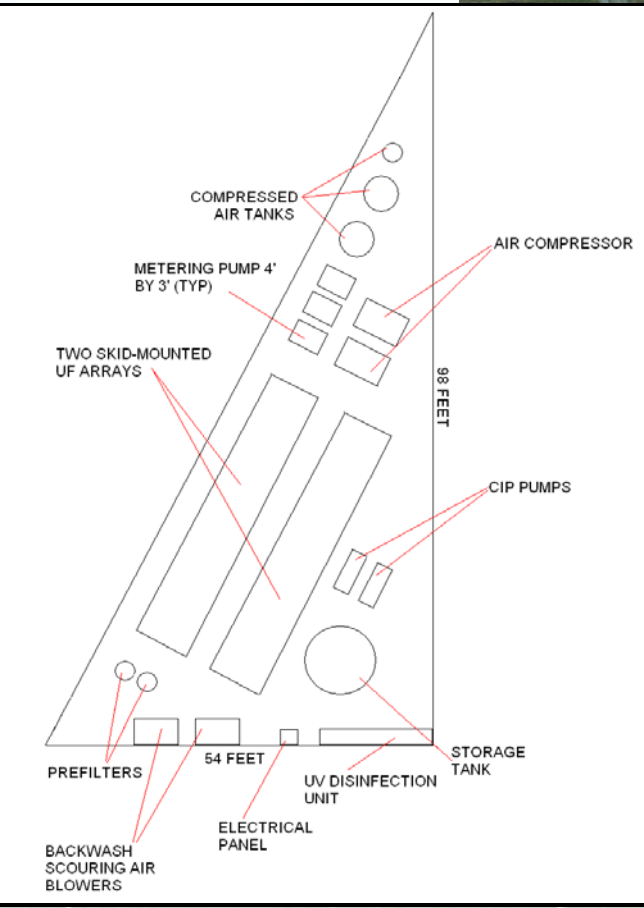
SF and MF Comparison

Parameter	Continuous Contact Sand Filtration	Membrane Filtration (MF)
Performance <ul style="list-style-type: none"> • Turbidity, NTU • BOD/TSS removal • TDS removal • Virus removal 	< 0.1 Yes No 2-3 log	< 0.02 Yes No 6-7 log
Filtration mechanism	Interception/collision/ electrostatic attraction	Sieving/straining
Influent water quality	Affected	Not affected
Water chemistry change	Affected	Not affected
Operating conditions change	Affected	Not affected
Failure mode	Can be catastrophic – microbial penetration	Incremental – individual fiber breaks, water quality not affected
Pretreatment required	Yes	No
Chemical addition required for Na, Cl, and SAR control	Yes	Yes
Rainy season outages tolerated	No	Yes
Backwash	5-10%	5-10%
Power consumption	Low	High
Loading conditions on concrete floor, lb/sf	2,000	1,200
Footprint, sf/MGD	2,400	1,500
Installation	Concrete Basins	Skid-Mounted
Ability to add capacity	Medium to low	High to medium
Chemical consumption	High to medium	Medium to low
Probable capital cost	\$1.5-\$2/MGD	\$2-\$3/MGD
Ease of Operation	More complex than MF	Relatively simple to operate
Media replacement	As needed	Every 5-8 years
Fast-Track Procurement	yes	yes
Competitive products	few	many

Technology Issues

- Sand Filtration is an apparent low-cost alternative based on the Parkson DynaSand product, however has fewer competitors
- Membrane Filtration appears to have higher costs, however, offers the following benefits:
 - Consistent and higher water quality
 - Smaller foot print
 - Better expandability options
 - Operational Flexibility
 - Potentially more competitive

Preliminary RW Facility Layout (based on MF)



Technology Selection Options

- The Board may choose to select treatment technology before moving forward with the project
- Alternatively, the Board may consider allowing two technologies for bidding against each other – this would work only if Design/Build approach is selected

Next Steps

- SAM Board Meeting – November 23, 2009
 - Authorize Project Management Contract

- SAM Board Meeting – January 25, 2010
 - Select Implementation Alternative
 - Authorize CEQA/NEPA Contract
 - Authorize Contract to Develop Fast-Track Request for Proposals (or add to PM Contract)
 - Authorize Contract to Re-package the FPS for Title XVI Funding Application