

**CLEAN BAY STRATEGY**  
**Including the South Bay Action Plan**

**STATUS REPORT**  
**JULY 1998**

(Flush Left: List of Trib Agencies)  
(Centered: Photo Montage)

**San Jose/Santa Clara**  
**Water Pollution Control Plant**

**Administered by the:**  
**ENVIRONMENTAL SERVICES DEPARTMENT**  
**City of San Jose**

# TABLE OF CONTENTS

<b>ABBREVIATIONS .....</b>	<b>i</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>ii</b>
<b>I FLOW REDUCTION.....</b>	<b>1</b>
I-A INDOOR WATER CONSERVATION .....	1
I-A1 ULTRA-LOW FLUSH TOILETS.....	1
I-A2 FINANCIAL INCENTIVE PROGRAM .....	3
I-A3 FLOW AUDIT STUDY PROTOCOL .....	3
I-B WATER RECYCLING AND REUSE.....	4
I-B1 SOUTH BAY WATER RECYCLING.....	4
I-B2 INDUSTRIAL WATER RECYCLING AND REUSE .....	9
I-C ENVIRONMENTAL ENHANCEMENTS .....	10
I-C1 STREAMFLOW AUGMENTATION .....	10
I-C2 WETLANDS CREATION.....	11
I-D OUTREACH FOR FLOW REDUCTION .....	11
<b>II POLLUTANT REDUCTION .....</b>	<b>14</b>
II-A INDUSTRIAL DISCHARGER RESEARCH STUDIES .....	14
II-B TRUNKLINE AND UPSTREAM MONITORING PROGRAM.....	20
II-C NEW DEVELOPMENT POLLUTION PREVENTION PROGRAM .....	24
II-D INDUSTRIAL WASTEWATER DISCHARGE MUNICIPAL CODE UPDATE .....	24
II-E INDUSTRIAL POLLUTANT LOADING STATUS .....	25
II-E1 Group 1 Dischargers.....	25
II-E2 Group 2 Dischargers.....	27
II-F OUTREACH FOR POLLUTION PREVENTION .....	27
<b>III SPECIAL STUDIES .....</b>	<b>29</b>
III-A NICKEL SPECIATION PROGRAM .....	29
III-B AVIAN BOTULISM.....	29
III-C SITE-SPECIFIC OBJECTIVES AND TMDL DEVELOPMENT .....	30
III-D LOCAL EFFECTS MONITORING .....	32
III-E MARSH MITIGATION STUDIES.....	32
<b>IV INFRASTRUCTURE OPTIMIZATION .....</b>	<b>34</b>
IV-A IN-PLANT RESEARCH STUDIES .....	34
IV-A1 Biological Nutrient Removal.....	34
IV-A2 Pre-Filter Chlorine Reduction.....	35
IV-A3 Treated Filter Backwash Water (TBW) Removal.....	35
IV-B HEADWORKS LOADING ANALYSIS .....	35
IV-C INFLOW IDENTIFICATION STUDY .....	35
IV-D GROUNDWATER INFILTRATION REDUCTION PROGRAM.....	36
IV-E OPERATIONS AND MAINTENANCE MANUAL .....	37
<b>V COOPERATIVE REGIONAL PROGRAMS .....</b>	<b>38</b>
V-A URBAN RUNOFF MANAGEMENT PROGRAM .....	38
V-B WATERSHED MANAGEMENT INITIATIVE .....	38
V-C REGIONAL MONITORING PROGRAM .....	40
V-D SUNNYVALE DIVERSION PROJECT.....	41
V-E MARSH MITIGATION PROJECTS .....	41

V-F BAY AREA REGIONAL WATER RECYCLING PROGRAM.....	42
V-G CALFED .....	43

**APPENDICES**

- A Group 1 Dischargers' Mass Audit Study Projects and Mass Loading for Copper and Nickel and Load Summary for Group 2 Dischargers
- B Outreach for Pollution Prevention
- C The Role of Speciation in the Removal of Nickel by the San Jose/Santa Clara Water Pollution Control Plant and its' Fate in San Francisco Bay
- D Industrial Newsletter, *The Tributary Tribune, Winter and Spring '98 edition*
- E Printed Materials Describing Best Management Practices

## ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BAPPG	Bay Area Pollution-Prevention Group
BMP	Best Management Practice
BNR	Biological Nutrient Removal
BOD	Biological Oxygen Demand
City	City of San José
ESD	Environmental Services Department
EDTA	Ethylenediamine Tetraacetate
FIP	Financial Incentives Program
IC/ID	Illicit Connections/Illegal Dumping
IU	Industrial User
IU Academy	Industrial User Academy
I/I	Inflow and Infiltration
MAS	Mass Audit Study
MECL	Mass Equivalent Concentration Limit
MFR	Maximum Feasible Reduction
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly-Owned Treatment Works
RCMP	Reasonable Control Measures Plan
SPC/DOE	Statistical Process Control and Design of Experiment
Regional Board	San Francisco Bay Regional Water Quality Control Board
SBWR	South Bay Water Recycling
SCVWD	Santa Clara Valley Water District
South Bay	San Francisco Bay, South of Dumbarton Bridge
State Board	State Water Resources Control Board
SWPPP	Storm Water Pollution Prevention Plan
TSS	Total Suspended Solids
TPAC	Treatment Plant Advisory Committee
ULFT	Ultra Low-Flush Toilet
URMP	Urban Runoff Management Program
Plant	San Jose/Santa Clara Water Pollution Control Plant
gpd	gallons per day
mgd	million gallons per day
mg/l	milligrams per liter
ppd	pounds per day
g/l	micrograms per liter

## EXECUTIVE SUMMARY

The long-term strategy of the San Jose/Santa Clara Water Pollution Control Plant and its tributary agencies is to implement integrated programs to achieve cost-effective protection of south San Francisco Bay. The array of programs involved in achieving this strategy and complying with regulatory requirements can be summarized in five broad categories: Flow reduction through water conservation, recycling, and environmental enhancements; pollution prevention partnerships and education; special studies to ensure that good science is the basis of our actions; achievement of optimum performance from the collection and treatment infrastructure to further enhance flow and pollutant reduction prior to discharge; and cooperative regional programs such as the Watershed Management Initiative to further maximize effectiveness.

The key focus over the first six months of 1998 has been flow reduction for the protection of the endangered species living in the salt marsh adjacent to the Plant. It became clear in late spring, however, that an extremely wet winter would hinder diversion efforts on two fronts: construction of facilities, and customer demand for recycled water. A booming economy, especially in the residential construction sector, also affected Plant flows. Staff determined that it was prudent to recommend early implementation of key elements of Tier I of the Contingency Plan. Accordingly, at its meeting on June 9, 1998, the San Jose City Council approved immediate implementation of all elements of Tier I of the Contingency Plan with the exception of mandatory toilet retrofit upon resale. For an interim period, the Council instead approved a pilot partnership with the Real Estate Board to test the efficacy of having its members actively encourage volunteer toilet retrofit in lieu of mandatory retrofit. That pilot will be evaluated in late August and brought back to Council for review in September 1998. The Council also authorized additional funding of \$500,000 for intensified public outreach and \$2 million for reduction of infiltration.

Highlights of the flow reduction efforts are presented below.

### **Water Conservation**

The Indoor Water Conservation element of the 1997 Revised South Bay Action Plan committed to a total flow reduction of 5-8 million gallons per day (mgd) over a five-year period, with an annual flow reduction goal of not less than 1 mgd. During fiscal 1997-98, an estimated 929,000 gallons per day (gpd) of flow to the Plant was avoided due to installation of ultra-low flush toilets (ULFTs). An additional 449,000 gpd flow reduction (almost double the goal of 250,000 gpd) was achieved as a result of the Financial Incentive Program. In summary, the net decrease due to water conservation for fiscal year 1997-98 was almost 1.4 mgd.

Older or low-income households and multi-family dwellings have been considered less likely to retrofit and yet are more likely to have older, high-flow or leaky toilets. Therefore, the Plant, San Jose (as administrator of the Plant), and the Santa Clara Valley Water District teamed up to offer special incentives to these customers. All of these programs are now available throughout the Plant's service area. The expanded area plus

an extra \$25 incentive in February and March (a limited time offer or LTO) generated sign-ups for 14,000 ULFTs. Based on the success of this effort, we have undertaken preparations to conduct a similar limited time offer for the existing residential \$75 Rebate Program in summer 1998.

### **Business and Industry Partnerships**

The business and industrial community has been an active partner in working toward reduction of flow and pollutants. Despite the booming economy and increased residential construction, total flow contributed by permitted Industrial Users was 11.6 mgd in calendar 1997 versus 12.1 mgd in calendar 1996.

Drawing on the success of and lessons learned from the Nickel Initiative Partnership, additional partnerships have been launched. These include:

- The “Slow the Flow” Campaign was launched by the Santa Clara Valley Manufacturing Group in conjunction with the San Jose Silicon Valley Chamber of Commerce, City of San Jose, the Plant and the Water District in May 1998. Thus far, 73 companies employing 65,000 employees have signed up to promote the flow reduction message to their employees.
- The Printed Circuit Board (PCB) partners are working to evaluate pollutant and flow reduction projects at their facilities. The partner companies include Sigma Circuits, Inc.; South Bay Circuits; Paragon Electronic Systems, and HADCO Santa Clara.
- The Semiconductor group (Hewlett Packard, IBM, Intel, National Semiconductor, and Siliconix) are working to conserve water and maximize reuse of industrial process flows.
- Pre-development recycling and/or reuse projects now include Calpine, Candescent Technologies, Dynamic Circuits, Hitachi, LSI Logic, MaxMedia, and Owens-Corning Fiberglass.

### **South Bay Water Recycling**

Excessive rainfall during the 1998 wet season and continued cool and wet weather into early summer reduced demand for irrigation water as well as adding an 85-day rain delay to the construction schedule. Nonetheless, pipeline segments in San Jose were completed and connected to the system, essentially bringing to a close the construction of the Phase 1 project with 21 mgd diversion capacity. Pipelines in all three cities have been filled including the Golden Triangle, Coyote/Old Oakland (Segments 1, 2, and 3), 12th Street, Senter Road and Yerba Buena sections. At present, the system is pressurized and customers are being served by the transmission pump station, which has been in operation since October 1997. The two remote pump stations, including a 4 million-gallon reservoir, are structurally complete and the control systems are 95% complete. The contractor is testing pump station operation with performance testing of equipment and software, and the stations are expected to be commissioned in August 1998.

Between January and July 31, an additional 20 customers have been connected to the system, bringing the total number of sites to 73. Irrigation demand for these sites is estimated at 5.4 mgd. Actual flows recently have been measuring up to 3 mgd and are expected to catch up to demand as summer temperatures continue to rise. By the end of the irrigation season, when the two remote pump stations are fully operational, 62 new customers will be added to the system, diverting an additional 5.4 mgd for a total of 135 customers and approximately 10.8 mgd diversion.

The Phase 2 project for deferred and infill work is ahead of the schedule targeted in the 1997 Revised South Bay Action Plan, which required the start of construction by January 1999. The contract has been awarded and construction will start in August 1998, which should achieve an additional 3 mgd diversion by the next irrigation season.

### **Streamflow Augmentation**

Presently, summer stream flows and water quality within the Santa Clara Valley Basin might not be sufficient to support healthy populations of cold-water species. Cold-water species of special interest include the Steelhead trout, proposed for federal listing as threatened, and fall-run Chinook salmon, likely to be proposed for listing. A pilot stream flow augmentation project was under development to discharge up to 8 mgd of recycled water into the Guadalupe River during the summer of 1998. Due to several regulatory constraints, this pilot is now being redesigned for the summer of 1999, along with a pilot project for discharging recycled water into Coyote Creek. The stakeholder process will continue to focus on discharge criteria, site selection, and regulatory requirements among other key issues.

### **Watershed Management Initiative**

Progress on the Santa Clara Basin Watershed Management Initiative is continuing. Over the last six months, several important milestones have been achieved, including:

- Core Group adoption of goals for the Initiative processes.
- Adoption of a “signatory document” to formalize Core Group representation and the decision-making process.
- Initiation of the development of the Watershed Assessment Report.

These actions provide a solid framework for the development and implementation of a Watershed Management Plan to achieve both the short- and long-term goals of the Basin’s stakeholders.

## I FLOW REDUCTION

A wide variety of programs intended to protect salt marsh habitat for endangered species by reducing the amount of treated wastewater (fresh water) discharged to south San Francisco Bay have been undertaken by the San Jose/Santa Clara Water Pollution Control Plant (Plant) in tandem with the tributary agencies and cities within the Plant's service area and in cooperation with the Santa Clara Valley Water District. These programs are contained in the Plant's NPDES Permit (Regional Board Order 98-052) as adopted by the San Francisco Bay Regional Water Quality Control Board (Regional Board) on June 17, 1998, and status updates are presented below.

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### I-A INDOOR WATER CONSERVATION

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The Indoor Water Conservation element of the 1997 Revised South Bay Action Plan commits to a total flow reduction of 5-8 mgd over a five-year period, with an annual flow reduction goal of not less than 1 mgd. The flow reduction for fiscal 1997-98 is estimated to be 1.4 mgd.

Indoor conservation programs focus most heavily on residential customers (as contributors of approximately 70% of Plant flows), and especially on the retrofit to Ultra Low-Flush Toilets (ULFTs) as the single most effective residential water conservation measure. Residents are encouraged to retrofit their toilets with a \$75 rebate (as well as future savings on their water bill) as the financial incentive.

In the business sector, the program's efforts include ULFT retrofits and the more flexible Financial Incentive Program (FIP), which offers rebates for equipment and process changes that reduce a company's effluent to the Plant.

The status of the programs in this element are described below. For a summary of the promotional campaigns that support all flow reduction activities, see Section I-D.

#### I-A1 ULTRA-LOW FLUSH TOILETS

##### **ULFT Rebate Program**

The Santa Clara Valley Water District funds rebates of \$75 per ULFT, in a program aimed primarily at single-family residences. The rebate program is offered by and administered through the local water companies while San Jose provides marketing support for the tributary area.



FY 97/98 Goal ULFTs	FY 97/98 Goal gpd	FY 97/98 to Date ULFTs	FY 97/98 to Date gpd	Program to 6/30/98 ULFTs	Program to 6/30/98 gpd
12,000	348,000	11,075	399,444	70,154	2,791,838

**Community Partnership Program**

This program offers free ULFTs and installation services to “hard to reach” communities in San Jose. The second phase was introduced in March 1998 with a goal of retrofitting between 6,000 and 16,000 units through June of 1999.

FY 97/98 Goal ULFTs	FY 97/98 Goal gpd	FY 97/98 to Date ULFTs	FY 97/98 to Date gpd	Program to Date ULFTs	Program to Date gpd
6,039	175,131	3,696	111,235	28,582	1,159,645

**Multi-Family Dwelling (MFD) Voucher Program**

The original MFD program offered “pre-bate” incentives of \$75 per ULFT and free toilet recycling services to apartment owners and managers. The results fell short of expectations. To make the opportunity to retrofit with ULFTs more attractive and to add urgency to the decision, the City offered for a limited time (January 1 through February 28, 1998), an additional \$25 per ULFT to assist with the cost of installation. At the same time, program eligibility was expanded to apartments throughout the tributary service area. The expansion plus extra incentive generated sign-ups for 14,000 ULFTs. Those projects are in various stages of completion. Based on the success of this effort, we are expecting to have a second limited time offer in summer 1998.

FY 97/98 Goal ULFTs	FY 97/98 Goal gpd	FY 97/98 to Date ULFTs	FY 97/98 to Date gpd	Program to Date ULFTs	Program to Date gpd
9,000	495,000	7,094	401,780	8,201	462,665

**Commercial/Industrial/Institutional (CII) ULFT Voucher Program**

This program has several components, including provision of ULFTs to schools; incentives to commercial establishments for the installation of ULFTs; and installation of ULFTs in City facilities. The program is on track to complete the installation of another 250 ULFTs in City facilities. The CII ULFT Voucher Program was made available to San Jose businesses and schools in April 1998 and will be expanded to the full tributary service area as of July 1, 1998. The previously proposed full-service program is being reviewed and may need to be revisited due to the excessive cost of service provision. The goal is to capture the high savings potential of ULFTs in small businesses (e.g., restaurants) at a reasonable cost per retrofit.

FY 97/98 Goal ULFTs	FY 97/98 Goal gpd	FY 97/98 to Date ULFTs	FY 97/98 to Date gpd	Program to Date ULFTs	Program to Date gpd
3,400	163,200	340	16,320	686	32,928

### **I-A2 FINANCIAL INCENTIVE PROGRAM**

The Financial Incentive Program, which previously offered rebates of \$2 per hundred cubic feet (ccf) per year to companies that implement equipment and process changes to reduce the amount of discharge to the sanitary sewer, has been enhanced effective July 1, 1998. The enhanced program offers a per unit rebate of \$4/ccf, the maximum rebate amount has been increased to \$50,000, and the program is now available tributary-wide.

FY 97/98 Goal (gpd)	FY 97/98 Completed (gpd)	FY 97/98 (# Applications)	FY 97/98 Active Applications (gpd)	Active Applications To Date	Program to Date (gpd)
250,000	187,000	10	449,000	14	554,000

### **I-A3 FLOW AUDIT STUDY PROTOCOL**

In preparation for the Tier I requirements of the Contingency Plan, we are in the process of developing a flow audit study protocol. The study will be performed by dischargers who are currently discharging 100,000 gallons per day (gpd) or more. Tier I dischargers will be required to implement all cost-effective flow reduction measures having a payback of five years or less. The status of the workplan elements is as follows:

- A preliminary list of permitted industrial dischargers and high volume non-permitted commercial and institutional facilities discharging 100,000 gpd or more is being established.
- A list of industry-specific reasonable control measures for flow reduction is under development.
- External stakeholders will be involved in the development and review of the protocol process.
- The finalized flow audit study protocol is scheduled to be available on October 15, 1998.
- Staff will be working closely with individual dischargers to ensure understanding and prompt completion of the studies.

A workshop addressing optimizing cooling towers operation and the potential for using reclaimed water is tentatively scheduled for late summer 1998. The target audience for the workshop is industrial dischargers and pretreatment inspectors and engineers involved in the flow audit study.

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**I-B WATER RECYCLING AND REUSE**

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**I-B1 SOUTH BAY WATER RECYCLING**

South Bay Water Recycling (SBWR) activities include:

- Construction and start-up of Phase 1 transmission and distribution facilities with a diversion capacity of 21 mgd;
- Identification and connection of recycled water customers; and
- Planning for system expansion and development for Phase 2 and beyond.

As detailed below, Phase 1 facilities are operational and are currently diverting approximately 4 mgd that would otherwise be discharged to the Bay.

**I-B1a Phase 1**

Excessive rainfall during the 1998 wet season and continued unseasonably cool, wet summer weather reduced demand for irrigation water and added 85 days of rain delay to the construction schedule. Nonetheless, pipeline segments in San Jose were completed and connected to the system since the January 1998 report, essentially bringing to a close the construction of the Phase 1 project. Pipelines in all three cities have been filled including Golden Triangle, Coyote/Old Oakland (Segments 1, 2, and 3), 12th Street, Senter Road and Yerba Buena. At present, the system is pressurized and customers are being served by the transmission pump station, which has been in operation since October 1997.

The two remote pump stations, including a 4 million gallon reservoir, are structurally complete and the control systems are 95% complete. The contractor is testing pump station operation with performance testing of equipment and software, and the stations are expected to be commissioned in August 1998. Throughout the construction period, quarterly samples have been collected and analyzed from the groundwater monitoring network and archeological monitoring has been performed as required at sensitive sites.

Since January, an additional 20 customers have been connected to the system, bringing the total number of sites to 73. Irrigation demand for these sites is estimated at 5.4 mgd. Actual flows recently have been measuring up to 3 mgd. By the end of the season, when the two remote pump stations are fully operational, 62 new customers will be added to the system, diverting an additional 5.4 mgd for a total of 135 customers and approximately 10.8 mgd diversion.

Attached are a map and tables of the customers. Among the larger customers are the Santa Clara Golf and Tennis Club; San Jose Minicipal Golf Course; a number of high-tech companies including 3-Com, Octel, Quantum, and Siemens Rolm; a number of municipal

parks including Lick Mill and Bernal; the San Francisco Forty-Niners Training Facility, the Bella Vista Apartments, and the Jubilee Christian Center.

In addition, all new industrial facilities and development with large irrigation applications in the vicinity of the recycled water pipeline are being required to use recycled water as a condition of development. The first indoor “dual plumbed” building is now under construction, demonstrating the use of recycled water for toilet flushing.

**Table 1- Connected Customers**

	SITE NAME	Ave. flow (mgd)
<i>Total Connected Before July 31, 1998</i>		
1	PAMPERED FARMS - WEST	1.2000
2	PAMPERED FARMS - EAST	0.6171
3	TRANSMISSION PUMP STATION	0.0019
4	S.CLARA GOLF & TENNIS	0.7193
5	McCARTHY FARM - MAIN	0.3600
6	WPCP - #3 WATER	0.3407
7	COYOTE CREEK VEG	0.0284
8	237 & GREAT AMERICA PARKWAY	0.0038
9	MARTINSON CHILD CARE CENTER	0.0019
10	SANTA CLARA LANDSCAPE (5 SITES)	0.0170
11	SIEMENS	0.0473
12	WPCP-RECYCLED WATER STATION	0.0473
13	LUCENT \ OCTEL	0.0435
14	OAK CREEK (12 SITES)	0.1098
15	LICK MILL PARK	0.0341
16	LICK MILL MEDIAN	0.0170
17	49ERS TRAINING FACILITY	0.0341
18	McCARTHY RANCH (12 SITES)	0.0686
19	CITY OF MILPITAS-LMD (5 SITES)	0.0189
20	BELLA VISTA APTS (EXTERIOR)	0.0208
21	ALL PURPOSE DISPOSAL	0.0019
22	NANTUCKET APTS	0.0019
23	McCARTHY FARMS-ALDER	0.3771
24	CHRISTIAN JUBILEE	0.0170
25	3-COM	0.0360
26	McCARTHY FARMS-ALDER	0.0000
27	BERNAL PARK	0.0114
28	MILPITAS SQUARE	0.1893
29	McCARTHY FARM -ALDER	0.1543
30	PIN HIGH	0.1514
31	DIVOT CITY	0.0473
32	CISCO BLDG. #2	0.0095
33	CISCO BLDG. #3	0.0076
34	CISCO BLDG. #4	0.0076
35	CISCO BLDG. #5	0.0076
36	GROUP BID #1 (OAK CREEK)-25% (8 SITES)	0.1420
37	S.J. MUNI GOLF COURSE	0.5200
<i>Total</i>		5.4134

**Table 2-Customers To Be Connected**

	SITE NAME	Ave. flow (mgd)
<i>Total to be Connected Between 8/1/98 and 10/31/98</i>		
1	THE VILLAGES-GOLF & CNTRY CLB	0.7571
2	OAK HILL MEMORIAL PK	0.7571
3	SILVER CREEK VALLEY CNTRY CLB	0.7193
4	GROUP BID #2 (MID SIZE)-25% (8 SITES)	0.6133
5	P.A. FARMS-(N) NOTRECH	0.4971
6	EVERGREEN COMM. COLLEGE	0.3786
7	ARZINO HORSE RANCH	0.1714
8	P.A. FARMS-(W) NOTRECH	0.1543
9	GROUP BID #1 (OAK CREEK)-25% (14 SITES)	0.1420
10	MISSION COLLEGE	0.1268
11	P.A. FARMS-(S) NOTRECH	0.1200
12	CALIFORNIA PAPERBOARD	0.1179
13	McCARTHY FARM - OCTEL	0.1114
14	SILVER CREEK HIGH SCHOOL	0.0946
15	GUADALUPE RIVER PARK	0.0757
16	BEHRING DIAGNOSTICS	0.0681
17	SOLARI PARK	0.0530
18	ANDREW HILL HIGH SCHOOL	0.0530
19	CISCO BLDG. #6-7 (6 SITES)	0.0454
20	SEVEN TREES SCHOOL	0.0379
21	SYLVANDALE MIDDLE SCHOOL	0.0379
22	EVERGREEN PARK	0.0379
23	COLUMBUS PARK	0.0379
24	LOS ARBOLES SCHOOL	0.0284
25	ALVISO PARK	0.0284
26	GENERAL ELECTRIC	0.0284
27	COYOTE CREEK VEG	0.0284
28	SILVER CREEK LINEAR PARK	0.0265
29	FRANKLIN SCHOOL	0.0208
30	SILVER CRK MAINTENANCE DIST.	0.0189
31	SAN JOSE CITY HALL	0.0170
32	PEERY-ARRILLAGA	0.0087
33	"811" PUMP STATION	0.0038
34	Keyes/12th ST. PUMPING STATION	0.0019
35	NOVELLUS BLDG #8	0.0019
36	RIVER OAKS PARK	0.0019
37	3-COM CORPORATION	0.0019
<i>Total</i>		5.4246

**Table 3-Customers To Be Connected**

	SITE NAME	Ave. flow (mgd)
<i>Total to be Connected Between 11/1/98 and 5/31/98</i>		
1	GROUP BID #2 (MID SIZE)-25% (8 SITES)	0.6152
2	GREAT AMERICA AMUSEMENT PARK	0.2271
3	SANTA CLARA UNIV.	0.1893
4	CALPINE/OLS	0.1768
5	GROUP BID #1 (OAK CREEK)-25% (15 SITES)	0.1439
6	BRIGADOON VILLAGE - HOA	0.1287
7	KELLY PARK	0.1268
8	CISCO SYSTEMS BLDGS. 8 - 19 (12 SITES)	0.0946
9	ROSEVELT PARK	0.0530
10	ZANKER MATERIAL RECOVERY	0.0473
11	WATSON PARK	0.0473
12	SAN JOSE MERCURY NEWS	0.0454
13	ELMWOOD	0.0379
14	DOVE HILL PARK	0.0379
15	WILLIAM STREET PARK WEST	0.0379
16	BAKESTO PARK	0.0379
17	BRIGADOON PARK	0.0360
18	MONTAGUE SCHOOL	0.0360
19	MONTAGUE POOL	0.0327
20	DOVE HILL SCHOOL	0.0322
21	LAFAYETTE PARK	0.0284
22	QUANTUM	0.0284
23	FAIRWAY GLEN	0.0246
24	JOHN MONTGOMERY SCH.	0.0208
25	HAPPY HOLLOW PARK	0.0151
26	MUNICIPAL STADIUM	0.0151
<i>Total</i>		2.3162

### **I-B1b Phase 2**

Deferred and infill work specified in the 1997 Revised South Bay Action Plan is ahead of schedule. The Action Plan required the start of construction by January 1999; the contract has been awarded and construction will start in August 1998, which should achieve an additional 3 mgd diversion by the next irrigation season.

In June 1998, the City approved an agreement with Montgomery Watson to provide consulting services for master planning and development of Phase 2 alternatives. The goal of the 18-month program is to identify feasible options for up to 15 mgd additional diversion by 2002 and 100 mgd of diversion by 2020, and to select the most cost-effective alternative to provide for short and long term diversion. Construction of the Phase 2 system is required to commence by January 31, 2001.

Potable reclamation feasibility studies and demonstration projects are included in Phase 2 work, and will be jointly funded by the Santa Clara Valley Water District.

### **I-B1c Special Irrigation Projects**

During the winter of 1997-98, the program experienced unseasonably wet weather. As a result, there were substantial delays in construction of the remaining Phase 1 facilities. To mitigate for delays, temporary irrigation and maintenance projects were developed to increase diversion during the 1998 dry weather months by irrigating vacant properties. Currently, 350 acres of Plant land are under cultivation and irrigated with recycled water, and additional undeveloped properties are being evaluated for irrigation to increase diversion on a temporary basis.

## **I-B2 INDUSTRIAL WATER RECYCLING AND REUSE**

The Industrial Water Recycling and Reuse element of the 1997 Revised South Bay Action Plan focuses on reusing a company's own discharge and/or use of SBWR water in manufacturing processes, heating, venting, and air conditioning systems, and irrigation. This element commits to a total flow reduction of 0.6 -1.2 mgd by the end of 1998 and between 2 - 4 mgd by the year 2002. Total flow contributed by permitted Industrials Users (IUs), including production increases, was 11.6 mgd in 1997 versus 12.1 mgd in 1996.

The following are updates to steps undertaken to achieve these discharge reductions:

Partnerships: Drawing on the success of Nickel Initiative partnership, additional partnerships have been launched. These include:

- The "Slow the Flow" Campaign was launched by the Santa Clara Valley Manufacturing Group in conjunction with the San Jose/Silicon Valley Chamber of Commerce, City of San Jose, the Plant and the Water District in May 1998. Thus



far, 73 companies employing 65,000 employees have signed up to promote the flow reduction message to their employees.

- The Printed Circuit Board (PCB) partners are working to evaluate pollutant and flow reduction projects at their facilities. The partner companies include Sigma Circuits, Inc.; South Bay Circuits; Paragon Electronic Systems, and HADCO Santa Clara.
- The Semiconductor group, Hewlett Packard, IBM, Intel, National Semiconductor, and Siliconix, are working to conserve water and maximize reuse of industrial process flows.
- Pre-development recycling and/or reuse projects now include Calpine, Candescent Technologies, Dynamic Circuits, Hitachi, LSI Logic, MaxMedia, and Owens-Corning Fiberglass.

Reference Materials: A detailed literature search was conducted and a reference library was established. These studies are available to the companies to identify potential recycling or reuse projects.

Database: An in-house database has been created to collect detailed information on projects that have or will be completed by the IUs in the Plant's service area.

Incentive Information: The Financial Incentive Program has been evaluated and enhanced (see Section I-A2 for details).

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## **I-C ENVIRONMENTAL ENHANCEMENTS**

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### **I-C1 STREAMFLOW AUGMENTATION**

The primary objectives of stream flow augmentation are to enhance habitat and improve water quality in streams by using recycled water. Because such use is not well-documented, short-term pilot studies with comprehensive monitoring programs are being designed to assess the positive and negative impacts of recycled water on aquatic habitats. Presently, summer stream flows and water quality within the Santa Clara Valley Basin are insufficient to support healthy populations of cold-water species. Cold-water species of special interest include the Steelhead trout, proposed for federal listing as threatened, and fall-run Chinook salmon, likely to be proposed for listing. A pilot project was under development to discharge up to 8 mgd of recycled water into the Guadalupe River during the summer of 1998. Due to several regulatory constraints, this pilot is now being redesigned for the summer of 1999, along with a pilot project for discharging recycled water into Coyote Creek. To date, design of the mobile pilot dechlorination system was completed, the contract was awarded, and construction is ongoing. Test run of the system will be conducted at the Plant using recycled water in Fall 1998. The stakeholder process will continue to focus on discharge criteria, site selection, and regulatory requirements among other key issues.

## I-C2 WETLANDS CREATION

A wetlands creation pilot project using recycled water is being developed as one of the environmental enhancement projects under the 1997 Revised South Bay Action Plan. Primary benefits would include aesthetic value, habitat enhancement, and public education. This pilot may or may not be implemented in conjunction with the stream flow augmentation pilot projects. Fresh water wetlands could be created and maintained through the discharge of recycled water. A feasibility study and a preliminary conceptual design have already been completed. Identification of potential location(s) and site specific designs should be developed over the next 6 to 12 months. The stakeholder process will be used to further develop this pilot project concept.

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## I-D OUTREACH FOR FLOW REDUCTION

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### Ultra-Low Flush Toilets

#### SFD Rebate Program

Recent marketing efforts to residents of single-family dwellings (SFDs) have delivered messages centered on replacing old toilets with ULFTs rather than on a more general conservation message. The principal vehicle is a series of advertisements in the *San Jose Mercury News* (“We’ll Pay You to Lower Your Water Bill”) that stressed the \$75 Rebate program for ULFT installations. The advertisements were intended to build on the foundation of understanding established by last year’s “It’s Our Bay, Treat It Right” campaign.

More than 1,900 calls have been received this year on the hotline that was established for the “It’s Our Bay” campaign last year. This hotline acts as a single point of contact for customer information about the Rebate program, eliminates multiple phone calls for the customer, and improves customer tracking.

Indoor conservation programs also were promoted at a variety of community events sponsored by the Tri-County Apartment Association, San Jose Silicon Valley Chamber of Commerce, San Jose Giants, and other organizations.

The following promotional activities are being launched in the near future:

***Real Estate Board Partnership:*** The real estate community strongly prefers incentive-based programs to mandatory retrofit of all toilets to ULFT’s upon resale. Therefore, in order to encourage voluntary retrofits, the Board volunteered to partner with the Plant to inform their customers of (a) incentives available for water conservation measures and (b) the possibility of forthcoming mandatory measures. The success of this partnership will be reported to the San Jose City Council in September 1998 with recommendations for next steps.

***Business and Industry Partnership:*** The City has partnered with the Silicon Valley Manufacturing Group, San Jose Silicon Valley Chamber of Commerce, and Santa Clara

Valley Water District to promote the flow reduction message to the South Bay employees of up to 100 member companies using internal communications resources such as e-mail, company intranets, newsletters, posters, brochures, and presentations. As of June 30, 1998, 73 companies representing more than 65,000 employees had signed up to participate in this “Slow the Flow” Campaign.

***Limited Time Offers:*** In response to the success of the additional \$25 incentive to apartment owners and managers, San Jose is also working with the Water District on a proposal to conduct a similar limited time offer for the existing residential \$75 Rebate Program. The purpose would be to accelerate participation by increasing the sense of urgency on the part of the customer. A public awareness campaign supporting this urgency will be launched later this summer using television, newspapers, direct mail and other media to reach the widest possible audience.

#### Multi-family Voucher Program

A multi-faceted outreach campaign was launched to encourage participation in the Voucher program for multi-family dwellings. A six-panel direct mail brochure was mailed to apartment managers and owners. This campaign also included a follow-up postcard mailed to remind prospective customers of the limited time offer for the additional \$25; print ads in the Tri-County Apartment Association (TCAA) magazine; telemarketing to managers and owners; and proactive one-on-one presentations to customers. The campaign was very successful, and a similar approach is underway for the Voucher program for businesses.

#### South Bay Water Recycling

SBWR promotion has three primary goals: (1) mitigating the impacts of construction activity to the general public, particularly commuters and those living or working along the pipeline; (2) increasing public acceptance of recycled water; and (3) convincing potential customers to retrofit and use recycled water.

Highlights of the public outreach activities conducted during the past six months include: winter and spring newsletters distributed to 60,000 residents and businesses along the pipeline route; a *San Jose Business Journal* advertisement encouraging businesses to consider recycled water and thanking customers who had already signed-up; a reception for potential customers held at the San Jose Arena during the Sybase Open Tennis Tournament; participation in a variety of community events and trade shows; a landscape workshop on February 26 in Santa Clara’s Lick Mill Park, which is successfully using recycled water; a fact sheet was developed to list the steps to getting retrofitted, answer questions, and provide customer testimonials; radio and print advertisements thanking residents for their patience during construction and reinforcing the benefits of recycled water; and enhancements to the SBWR web site.

A “South Bay Water Recycling Curriculum for Middle School” was developed. It includes an overview of water issues relating to water recycling, storm water pollution prevention, wastewater treatment, and wetlands preservation.

## II POLLUTANT REDUCTION

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### II-A INDUSTRIAL DISCHARGER RESEARCH STUDIES

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The Printed Circuit Board (PCB) partners continued working with the City to evaluate pollutant and flow reduction projects at their facilities as part of Phase II of the partnership. The research group has established copper, nickel and flow baseline information and will continue evaluating feasible reduction(s) by sharing the lessons learned from each other and with other members of the PCB manufacturing community. The partner companies are Sigma Circuits, Inc.; South Bay Circuits, Inc.; Paragon Electronic Systems, and HADCO Santa Clara, Inc.

#### **Framework**

The research group meets twice a month and includes representatives from the four companies and the City. The group members come from a variety of backgrounds such as engineering (manufacturing and environmental), facility, process control, analytical chemistry and environmental compliance. All information necessary to investigate pollutant and flow reduction projects at each facility is shared and discussed within the one workgroup. Issues encountered during the research process (e.g., identifying all sources/mass balances, applicability and implementation concerns of various potential projects, etc.) will be discussed.

The research group has been working since August 1997 following a workplan established during the early phases of the partnership. The overall workplan consists of the following phases for the initial research period of the partnership:

- Phase I (Initial Phase): August to December 1997
- Phase II (Execution Phase): January to May 1998
- Phase III (Closure/Renewal Phase): June to October 1998

The three phases of the initial research period will end in October 1998, but could be extended to achieve the goals listed in the workplan by agreement with all parties.

#### **Partners' Wastewater Treatment Systems & Sample Plans**

A fundamental part of the research effort has included a review of the varying technologies used at the partners' sites as well as the development of site sample plans. A summary of each partner's water treatment systems and sample plan follows.

#### **Sigma Circuits, Inc.**

Sigma Circuits utilizes a conventional flow-through, gravity settling system to remove metals from process rinse water streams. Waste rinses are categorized and segregated

into metal and non-metal bearing wastestreams. Metal bearing rinses are collected in a hard pipe system and pumped to a collection tank. Lift pumps move the waste to a pH adjusted tank where proprietary chemicals are added via an oxidation-reduction potential (ORP) control system. A flocculating agent is added to enhance settling and the waste is passed through an above ground gravity settling unit. The clarified effluent is collected and mixed with the non-metal bearing rinses in a pH adjusted tank. The mixed waste stream is passed through a sampling point and discharged to the City sewer system. Concentrated metal bearing waste is collected in 55-gallon drums and accumulated for treatment in above ground, fixed treatment units. The waste is treated with proprietary chemicals and the metal hydroxides filtered from the effluent using a filter press. The effluent is directed back to the flow through system.

**Sampling Program:** A sampling plan was developed to characterize wastewater treatment efficiency, metals removal and mass balance within the wastewater treatment process. The sampling program was carried out from March 9 through March 23, 1998 at four sampling points within the wastewater treatment system. The four sampling points selected were the final discharge, the clarifier discharge, the non-metal bearing waste stream and the metal bearing waste stream. A total of thirty-two, 24-hour composite samples were collected and analyzed for copper, nickel and lead using the City of San Jose's analytical laboratory. The City was also involved in the sample collection. Total and dissolved copper and nickel were analyzed at each of the 4 sampling points. The sampling program also measured and estimated flows at each manufacturing process step, documented wastewater treatment process parameters and collected manufacturing throughput information for later data analysis.

**Preliminary results:** Preliminary results indicate that the pretreatment system is 99% efficient in copper removal and 82% efficient in nickel removal. Approximately 50% and 92% of discharged copper and nickel, respectively, are dissolved. Eighty-four percent of the flow to the treatment system is from metal bearing waste streams and 16 percent is from non-metal bearing waste streams.

#### South Bay Circuits (SBC)

There are three separate waste treatment systems for South Bay Circuits. Two are typical metal precipitation systems and the other is an ion exchange system. One of the metal precipitation systems is a total treat type system. This means all of the reaction tanks are built into the clarifier. The other precipitation system has two reaction tanks and a clarifier. Both use a sand filter for final polish. The Ion Exchange systems has four resin beds. Two at a time are used in a lead/lag operation. A portion of the treated wastewater from the ion exchange system is also reused in the manufacturing process.

**Sampling Program:** The sampling program occurred from April 22 through May 15, 1998. The Research Study Group's Source Control Inspector and South Bay Circuits' Wastewater Treatment Supervisor set up four samplers in Buildings 1 and 3 to measure the total and dissolved copper, lead, and nickel concentrations both before and after pretreatment. The purpose of this measurement is to determine the treatment system

efficiency. A total of 10 sample points were selected for buildings 1 and 3. The sample point locations are described in following table.

<b>Bldg.</b>	<b>Sample Point</b>	<b>Area</b>
<b>3</b>	1	Chelated Waste
	2	Metal Bearing
	3	Non-Metal Bearing
	4	Final pH Adjust
	5	Discharge
<b>1</b>	6	Interior Metal Bearing Sump
	7	Interior Non-Metal Bearing Sump
	8	Clarifier
	9	Discharge
	10	Batch

Preliminary results: Initial sampling results indicate that the pretreatment system in Building 1 is 99% efficient in copper removal, 86% efficient in nickel removal and 77% efficient in lead removal. The results also indicate that the pretreatment system in Building 3 is 98% efficient in copper removal, 56% efficient in nickel removal and 61% efficient in lead removal.

The overall preliminary results indicate that the pretreatment system at South Bay Circuits is 99% efficient in copper removal, 86% efficient in nickel removal and 77% efficient in lead removal. Approximately 68% and 65% of copper and nickel respectively of discharged metals are dissolved. Ninety nine percent of the metals to the treatment system is from metal bearing waste streams and one percent is from non-metal bearing waste streams.

Paragon Electronic Systems, Inc.

Paragon's internal wastewater flows are segregated into two main streams: metal bearing and non-metal bearing. The non-metal streams flow to a 1650 gal. tank for final pH adjustment and discharge to sanitary sewer. Metal containing process lines include a dragout and a single or cascading rinse. Rinses containing any oxidizers are plumbed to a pH adjust holding tank, and then pumped to the Ion Exchange system for metals removal. The treated wastewater then flows into the 1650 gal. final pH adjust tank and is discharged to sanitary sewer. Oxidizer rinses after the dragouts are plumbed to the 1650 gallon pH adjustment tank, then discharged to the sanitary sewer. Dragout rinses and compatible spent process baths containing metals are batch treated with caustic soda, ferrous sulfate, sodium sulfide and a polymer. The slurry is then filter pressed and sent for recycling. The remaining liquid is checked for metal, pH adjusted, and discharged into the

final pH adjustment tank. Spent baths that are not compatible with batch treatment or are reclaimable in their spent state are sent to disposal or reclamation.

Sampling Program: There are three sample points including the final sump prior to discharge to the sewer, the accumulation tank prior to ion exchange system, and the discharge pipe from the ion exchange system just before final pH adjustment. Sample analysis consisted of total amounts of copper, nickel, and lead and dissolved amounts of copper and nickel. A total of 27 composite samples were taken and retrieved on a daily basis under the direction of the group's Source Control Inspector.

Preliminary results: Preliminary results indicate that the ion exchange system at Paragon is 99% in copper removal, 53% efficient in nickel removal and 90% efficient in lead removal. Approximately 95% and 97% of copper and nickel respectively of discharged metals are dissolved.

HADCO Santa Clara, Inc. (formerly Zycon Corporation):

HADCO utilizes three wastewater treatment technologies at the Santa Clara facility. In-process ion exchange is used to remove heavy metals from rinse water and recycle this water back to the manufacturing process. The end-of-line treatment process is a continuous flow chemical precipitation technology that removes the dissolved metals from the wastewater prior to discharge to the San Jose/Santa Clara Plant. A batch treatment process is used to treat concentrated spent process chemicals prior to discharge to the continuous flow treatment plant.

In-Process Ion Exchange: HADCO operates four ion exchange systems to remove copper, nickel, tin, lead and gold from rinse water generated in the various manufacturing processes. Ion exchange systems are in place to reduce water usage and hydraulic load on the end-of-pipe wastewater treatment system. Each system operates 24 hours per day, seven days per week.

Tin/lead-bearing, nickel-bearing, and gold-bearing rinse waters are segregated and treated in dedicated ion exchange columns. Effluents from the tin/lead ion exchange system, the nickel ion exchange system, and the gold ion exchange system are also passed through the copper ion exchange system to remove copper prior to reuse in the manufacturing process. Copper-bearing rinse waters pass directly to the copper ion exchange system prior to recycling back to the manufacturing process. Each of the ion exchange systems is regenerated using hydrochloric or sulfuric acid for the cations and sodium hydroxide for the anions. The concentrated regenerant is treated in the continuous flow end-of-pipe system.

Batch treatment of Spent Process Solutions: HADCO utilizes four 1500-gallon cone bottom tanks for treating spent solutions. Spent metal bearing solutions are pumped from dedicated holding tanks into one of four 1500-gallon tanks. They are transported to the holding tanks through dedicated drain lines. To precipitate the metals from the solutions, sodium hydroxide or sulfuric acid is added to adjust the pH to the required level.



Wastewater treatment chemistry is then added to the batch to precipitate the desired dissolved solids or heavy metals. The batch is then filtered through a filter press and discharged to the continuous flow system for final polishing prior to discharge to the sanitary sewer system. Dewatered sludge is sent off site for metal recovery.

**Continuous Treatment of Waste Water Streams:** The 150-gpm end-of-line wastewater treatment system removes heavy metals from fume scrubber blow-down water, process rinse water that is not recycled through the ion exchange systems, and rinse water from miscellaneous areas (floor drains, sinks, lab. etc.) throughout the facility. The system uses the Romar process, a patented process from Romar Technologies Inc. The wastewater treatment plant is operated 24 hours per day, seven days per week.

In the Romar Process, metal hydroxide sludge from the clarifier is recycled and converted into a useful reagent for treating wastewater. The Romar Process recovers heavy metals as highly concentrated metallic solids. This reagent is a ferrous (iron) solution called “RP-Reagent” that is used for treating chelated wastewater.

The heavy metals and excess dissolved iron are co-precipitated as hydrated oxides and hydroxides in an insoluble mixture. An anionic polymer is used to produce heavy, fast settling solids. A Lamella clarifier is then used to remove the solids. Some of the iron in these solids are then recycled to produce the reagent and the non-ferrous solids are dewatered in a filter press and sent off-site for metal recovery.

**Sampling Program:** To characterize the HADCO wastewater treatment process, six sampling points were selected. The final collection tank, the feed and effluent from the Romar process, the non-metal bearing wastewater drain and feed and effluent from the pretreatment process were the six feed lines that were identified as the source of all the dissolved heavy metals in the waste stream. Twenty four-hour composite samples were taken over a two-week period from each sample point. The samples were analyzed for copper, lead and nickel. This data will be used to calculate the mass balance and the efficiency of the treatment process.

**Preliminary results:** Up to the date of completing this report, the sampling program was still going on for HADCO. Preliminary results will be provided in future reports.

**Summary of Current and Future Activities of Partnership (Jan. 98 to Oct. 98):**

The following is a list of activities that have been completed or are currently underway. The status of each activity is shown in parenthesis following the description.

1. Evaluate copper, nickel, and lead removal efficiency of the existing wastewater treatment processes at team members' facilities (ongoing)
2. Develop mass balance for the team member's processes (waste streams, pretreatment, and wastewater discharge)

- A. Plan sampling and flow monitoring programs (completed)
  - B. Implement sampling and flow monitoring programs (completed)
  - C. Conduct data analysis and obtain results (ongoing)
3. Partnership Progress Report (completed)
- A. Submit progress report to City and partners for the period (January 98 to June 98) by June 30, 1998
4. Evaluate existing engineering solutions installed by team members at critical production processes (next steps)
5. Site-Specific Wastewater Treatment. (next steps)
- A. Plan sampling and flow monitoring programs for Design of Experiment (DOE) and Statistical Process Control (SPC) evaluation
  - B. Implement sampling and flow monitoring programs
  - C. Conduct data analysis and optimization processes and apply SPC/DOE principles
  - D. Evaluate results and findings
  - E. Recommend optimum set-ups at the pretreatment processes at the team members' companies
6. Conduct economical studies (ongoing)
- A. Develop \$/lb. overall removal cost for nickel, copper, and lead
  - B. Investigate the applicability of wastewater segregation at selected facilities (next steps)
7. Recommend projects for future evaluation (e.g. water reuse) (next steps)
8. Extend Research Agreement (next steps)
- A. Evaluate the need for extension of the research agreement
  - B. Apply for extension of the research agreement for one more year, if necessary
9. Partnership Progress Report (next steps)
- A. Submit progress report to City and partners for the period (July to October 1998) by December 31, 1998

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## II-B TRUNKLINE AND UPSTREAM MONITORING PROGRAM

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In October 1995, the City developed and implemented a Trunkline and Upstream Monitoring Program to focus on tracing pollutants upstream from the WPCP. The long-term intent of the program is:

- Identify the sources of pollutants entering the Plant to specific trunklines (or cities) of origin.
- Attempt to identify whether pollutants enter the Plant in a consistent manner or in slug loads.
- Trace the pollutants by continually moving upstream to their sources.

This status report compares the pollutant loading at the five trunklines over the past five reporting periods and discusses significant trends at the trunkline and upstream sites.

### **Program Findings**

Pollutant loadings for nickel and copper entering the Plant appear to have stabilized. There have not been any instances of sustained unknown sources or extreme values during the current reporting period.

### **Mass Loading**

Figures 1 through 4 show the mass loading trend for the trunklines entering the Plant during the five reporting periods (see next section for the location of each trunkline). The first reporting period covers January through May 1996, the second is June through October 1996, the third is November 1996 through April 1997, the fourth is May 1997 through November 1997, and the fifth is December 1997 through May 1998.

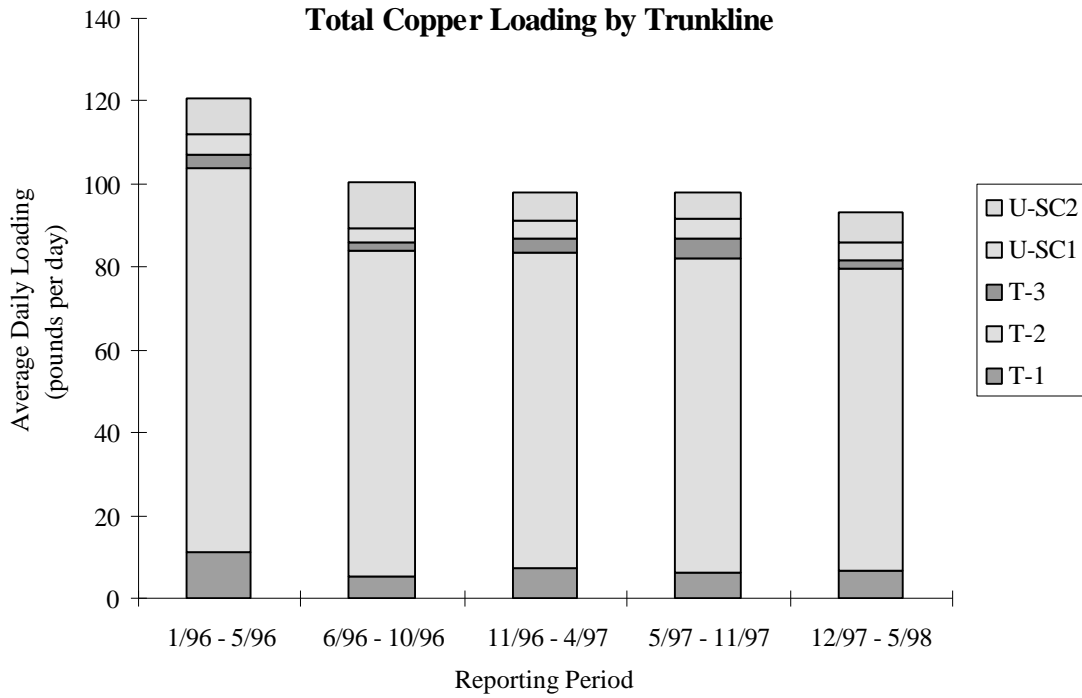
Figure 1 shows the average daily loading of total copper at each of the trunklines. Current total copper loading at the trunklines is consistent with the previous three reporting periods, suggesting that total copper concentrations have stabilized.

Figure 2 shows the average daily loading of dissolved copper at each of the trunklines. Current dissolved copper loading at the trunklines is consistent with the previous reporting period.

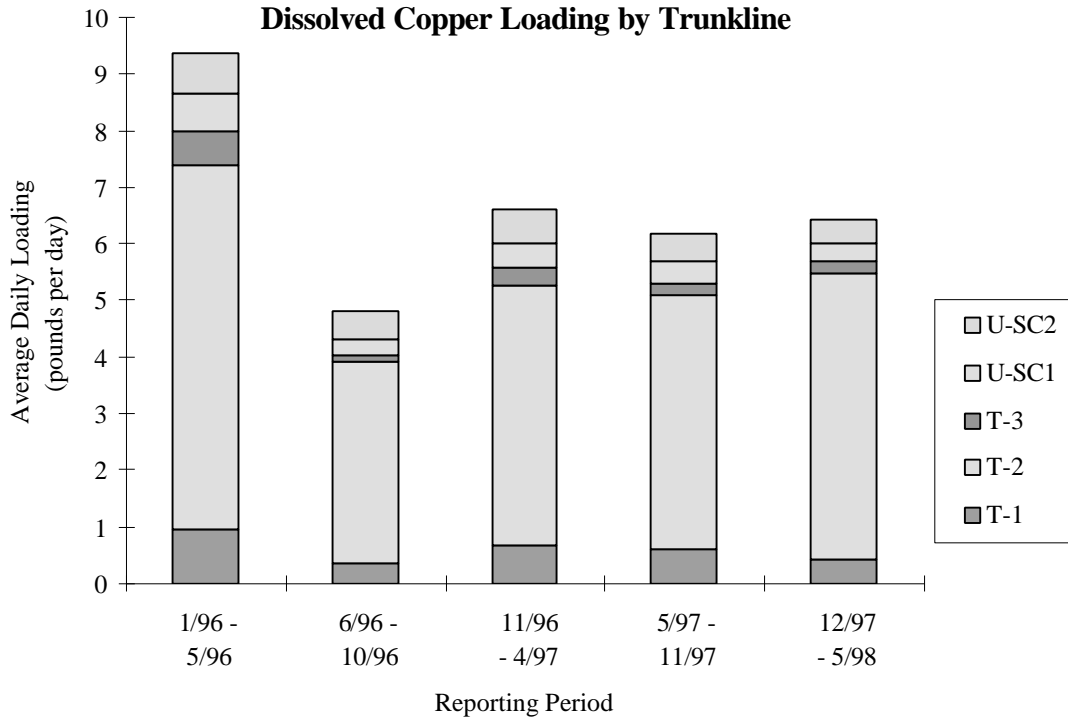
Figure 3 shows the average daily loading of total nickel at each of the trunklines. Total nickel loading at T-1 has decreased significantly from the previous reporting period due to lower total nickel concentrations. Total nickel loading at T-2 has decreased slightly.

Figure 4 shows the loading for dissolved nickel at each trunkline. The dissolved nickel loading has significantly decreased at T-1 from the previous reporting period due to lower dissolved nickel concentrations. This decrease has been offset by an increase in dissolved nickel loading at T-2. The increased loading at T-2 is a result of increases in dissolved nickel concentrations and flow.

**Figure 1**  
**Total Copper Loading by Trunkline**

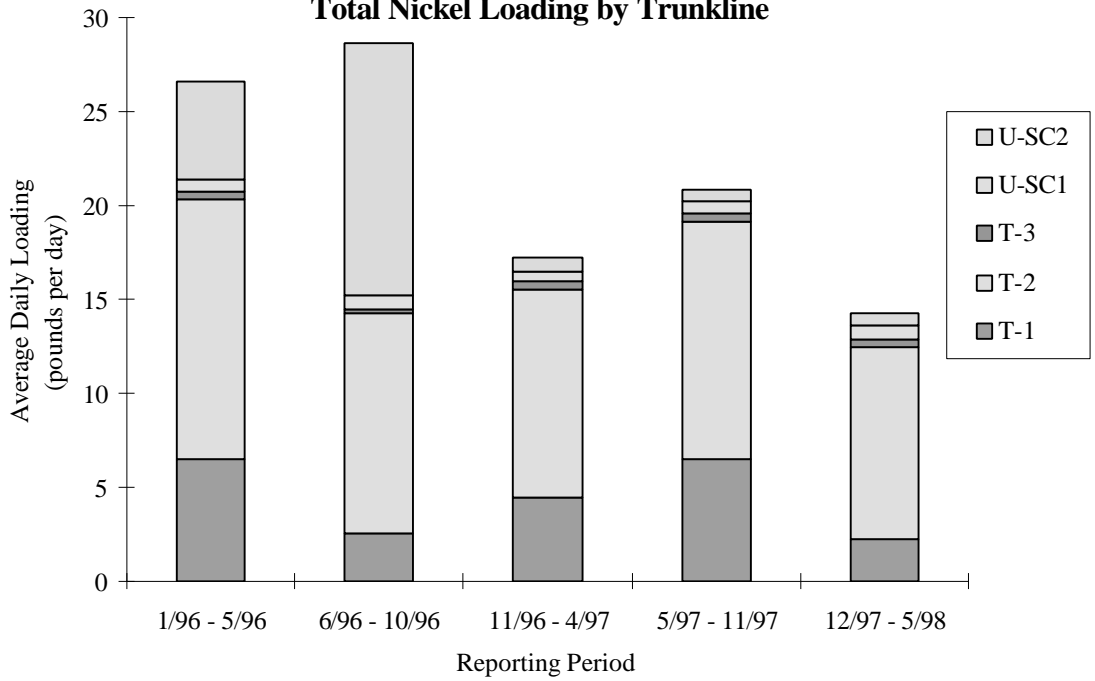


**Figure 2**  
**Dissolved Copper Loading by Trunkline**



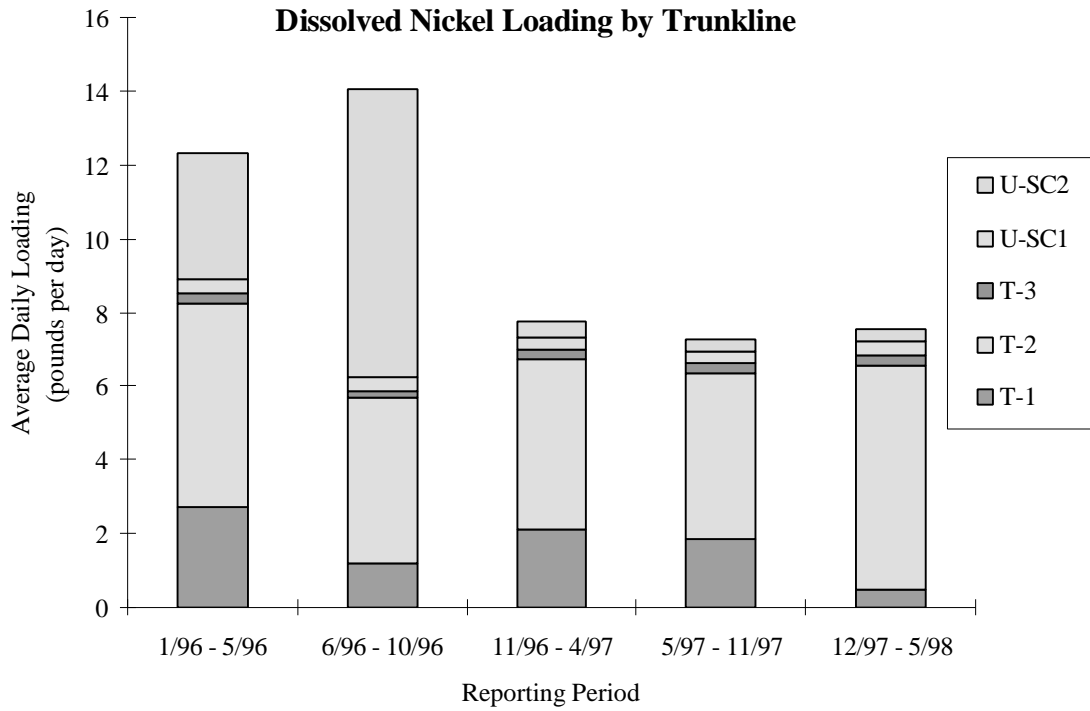
**Figure 3**

**Total Nickel Loading by Trunkline**



**Figure 4**

**Dissolved Nickel Loading by Trunkline**



### **Future Program Activities**

The Trunkline and Upstream Monitoring Program will continue to monitor the trunkline and upstream sites as needed to search out sources of extreme pollutant concentrations. Program data will be used to support surveillance, inspection, and outreach efforts.

### **Monitoring Sites**

Trunkline Monitoring Sites: Wastewater flowing into the Plant can be isolated into three trunklines and two upstream sites approximately representing San JosÈ, North San JosÈ, Milpitas, and Santa Clara. The current monitoring sites that represent the total flow entering the Plant are as follows:

- T-1 represents wastewater flows from Milpitas.
- T-2 represents wastewater flows from San JosÈ, the southeast quadrant of Santa Clara, and the West Valley Sanitation District.
- T-3 represents wastewater flows from North San JosÈ.
- U-SC1 represents wastewater flows from Santa Clara between the GuadalupÈ River and San Tomas Aquino Creek north of Central Expressway.
- U-SC2 represents wastewater from Santa Clara west of San Tomas Aquino Creek. Cupertino discharges wastewater into the sewers of Santa Clara and contributes to the flow at U-SC2.

Upstream Monitoring Sites: During the past six months, one additional upstream monitoring site was established to characterize pollutant concentrations from an industrial park not previously monitored. Upstream site U-M2 was established in Milpitas to characterize pollutant concentrations coming from the industrial park located north of Montague Expressway between Main St. and Milpitas Blvd. To date, insufficient data has been collected to characterize this site.

Monitoring at upstream site U-M1 has been discontinued because pollutant concentrations have decreased significantly. The decrease is likely the result of several large industries ceasing industrial processes and discharge to the sanitary sewer.

Of the upstream monitoring sites, two are continually monitored for industrial discharge activity. Listed below are the upstream monitoring sites that have consistently shown elevated pollutant levels attributed to industrial activity.

- U-SC3 - this site collects wastewater from Santa Clara south of Central Expressway and east of San Tomas Aquino Creek. This site flows through T-2.
- U-SJ2 - this site collects wastewater from the North San Jose industrial park bounded by Trimble Rd., Brokaw Rd., Trade Zone Blvd., and the Western Pacific Railroad. This site flows through T-2.

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## II-C NEW DEVELOPMENT POLLUTION PREVENTION PROGRAM

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During the planning process for new development, the City of San Jose reviews all proposed projects to identify and address all issues that may affect the city. Over the last year, wastewater discharge quality and flow issues have been made a permanent part of that review process through the involvement of Environmental Services Department staff. These reviews provide developers with requirements for flow, pollution reduction, energy efficiency, and use of recycled water at the earliest planning stage, preferably prior to design and construction of new buildings and facilities. An additional benefit has been increased awareness of these requirements by other City departments.

During the first six months of 1998, the team identified potential wastewater pretreatment and pollutant reduction for 64 projects; the ability to use of recycled water for 76 projects; and potential water-conservation measures beyond current Municipal Code requirements for 8 projects.

Benefits of this approach to date include:

- An agreement with permit negotiated conditions on a new Ionics facility
- Pre-development meetings with companies regarding the need to limit future wastewater discharges at new facilities
- The use of recycled water in some irrigation at the Cerra Plata planned residential development
- Agreements for the use of recycled water in irrigation of new commercial development at McCarthy Ranch

Future actions include working with the other tributary agencies and cities in the Plant's service area to include similar prospective reviews in their planning process.

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## II-D INDUSTRIAL WASTEWATER DISCHARGE MUNICIPAL CODE UPDATE

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On June 9, 1998, the San Jose City Council approved a change to the current San Jose Municipal Code, Chapter 15.14.255 definition of "Critical User". The definition will now read as follows:

Critical User means a discharger whose wastewater contains priority pollutants, or who discharges any waste other than sanitary sewage which has the potential to cause interference, or who discharges in excess of 100,000 gallons per day.

This change was necessary to ensure that the commercial, industrial and institutional portion of the 1997 Revised South Bay Action Plan and the required Contingency Plan can be implemented on schedule.

The City mailed letters to the tributary agencies and cities in the Plant's service area requesting that the adoption of comparable ordinances be expedited. A preliminary survey

indicated that most potential Tier I companies are located within the cities of San Jose, Santa Clara and Milpitas.

On June 23, 1998, the San Jose City Council adopted a Council Resolution which amends the Administrative Citation Schedule of Fines for several Chapters of the San Jose Municipal Code. One of the newly included chapters was Chapter 15.14, which regulates the discharge of industrial wastewater to the sanitary sewer. This resolution set fines ranging from \$100 to \$1,000 for these violations of the Municipal Code.

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## **II-E INDUSTRIAL POLLUTANT LOADING STATUS**

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As a provision in the Plant's NPDES Permit (Regional Board Order 98-052), the pretreatment program has set a goal to "Östrive to maintain permitted industrial headwork's loading at 1997 levels for copper and nickel during the period of this permit." Permitted Industrial Dischargers are classified into three industrial sectors: Group 1, Group 2, and Group 3 Dischargers.

Group 1 Dischargers are companies who typically use copper and/or nickel in their industrial process and discharge a mass loading in excess of 0.04 pound per day of nickel or 0.09 pounds per day copper. Group 3 Dischargers do not use copper or nickel in their processes and discharge less than a thousand gallons per day each. Group 2 Dischargers are Industrial Users who are neither a Group 1 nor a Group 3 Discharger.

In the January 1999 report, we will begin reporting the year-to-date average daily flow and copper and nickel loadings for the three permitted industrial sectors as compared to the 1997 baseline.

### **II-E1 Group 1 Dischargers**

#### Loading Summary for Group 1 Dischargers:

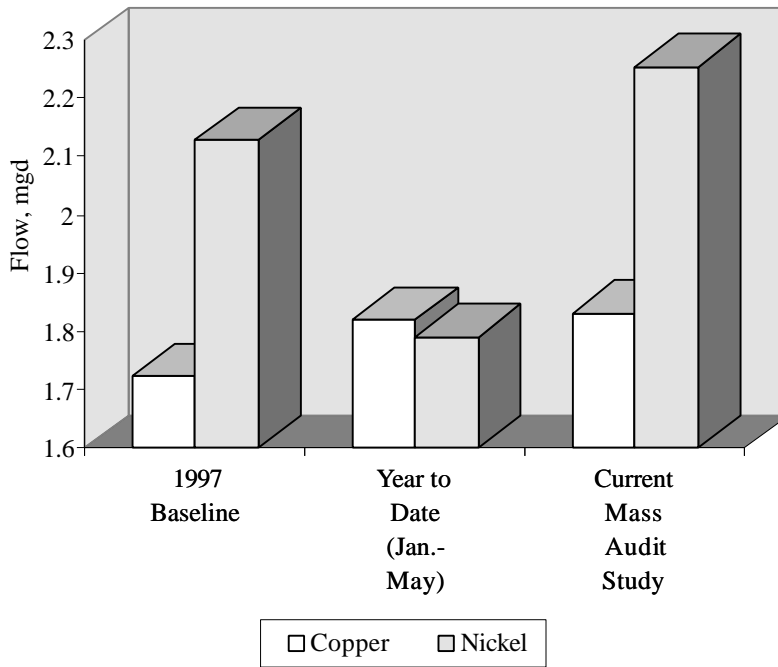
Figures 5 and 6 show the 1997 baseline flow and copper/nickel mass loading versus the 1998 year to date flow and copper/nickel mass loading for Group 1 Dischargers. Tables A-1 and A-2 of Appendix A show the June 1, 1997 – May 31, 1998 average mass loading and Mass Equivalent Concentration Limits (MECLs).

#### New Mass Audit Studies (MAS), MAS Amendments and MECL Enforcement Action:

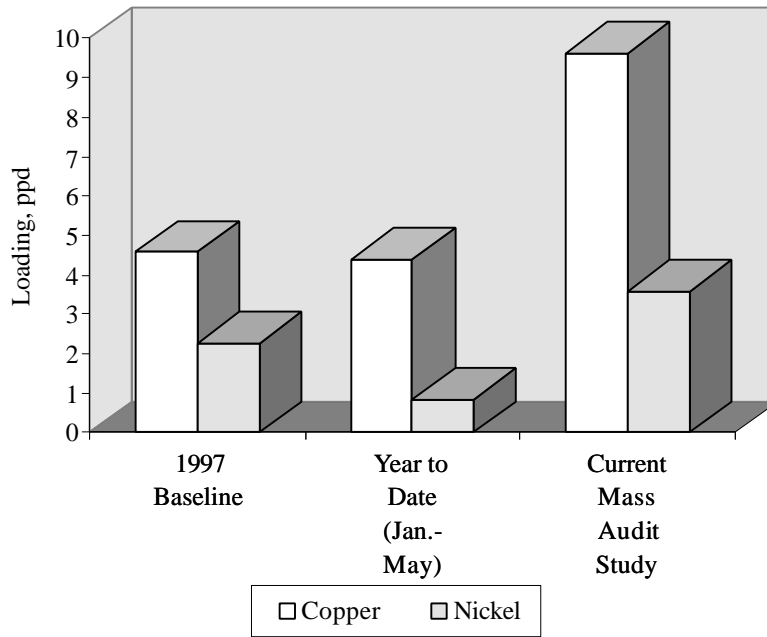
Nu-Metal Finishing, Inc. (SC-064B) has received an amended MAS Flow due to its documented increase in production. StorMedia purchased two Group 1 Dischargers during this reporting period: Akashic Memories and AMC Substrates. StorMedia accepted the Akashic Memories facility's existing nickel MECL and is in the process of closing the AMC Substrates facility. Therefore, AMC Substrates (MI-008A) no longer has an active permit to discharge.



**Figure 5**  
**Industrial Copper/Nickel Flow**



**Figure 6**  
**Industrial Copper/Nickel Loading**



One Group 1 Discharger violated its' MECL limit(s) during this monitoring period. Sun Circuits I (SC-102B) had one violation of their MECL for copper. For more details of enforcement action taken, see the Industrial User Violation Report Compliance Tables.

## **II-E2 Group 2 Dischargers**

Loading Summary for Group 2 Dischargers: A new system has been established to track the flow and copper/nickel mass loading for all Group 2 Dischargers. Table A-3 in Appendix A is a copy of the data tracking format being used. The data necessary to determine the Group 2 1997 baseline is currently being verified and is not ready for publication in this report. Therefore, no comparisons against a baseline can be made at this time. This information will be presented in the January 1999 report.

New Reasonable Control Measures Plans (RCMPs), RCMP Amendments and Annual Average/Daily Maximum Enforcement Action: No new RCMPs have been approved during this monitoring period. Anoplate Metal Finishing Co. (SJ-042B), Sun Circuits III (SC-262B) and Hitemp Technologies, Inc. (SJ-122B) have received enforcement action due to annual average violations for copper or nickel. Teltec Corp. (SJ-307B), a company with an approved RCMP, has violated their average daily concentration limit for copper. For more details of enforcement action taken, see the Industrial User Violation Report Compliance Tables.

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## **II-F OUTREACH FOR POLLUTION PREVENTION**

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A wide range of outreach activities support the Pollution Prevention programs, and are fully documented in Appendix B. A summary is presented below.

### **Regional Outreach**

Staff are continuing to participate on various regional committees in order to assist in coordinating outreach activities throughout the tributary area, as well as throughout the San Francisco Bay Area. Such coordination simplifies the messages received by the public, reduces costs, and avoids unnecessary duplication. Specific projects during this reporting period included production of a regional ad campaign, a regional media relations event at Shoreline Park, the Watershed Management Initiative's first outreach piece, translated regional materials, and regional Spanish radio ads.

### **Residential Outreach**

A Water Speakers Bureau, Internet web site, and Plant tours are used to reach residents and representatives of business and industry with messages of specific value to them.

During this reporting period, staff participated in five major community events; provided speakers to four business organizations and to three groups requesting a Spanish-language presentation; and produced various pollution prevention materials for distribution.

Storm sewer inlet stencils were updated to include the name of the creek to which the inlet drains, a hotline was added, fact sheets and brochures were produced, newspaper advertisements were produced in three languages (English, Spanish, Vietnamese), and radio advertisements were broadcast in English and Spanish. During the next three to four years, the urban runoff outreach campaigns will focus on the harder-to-reach communities and on the specific activities of automotive repair and proper disposal of used motor oil and household toxics.

### **Commercial and Industrial Outreach**

In addition to the web site mentioned above, highlights of commercial outreach activities for this reporting period include an industrial user newsletter (“Tributary Tribune”), an Industrial User Academy, speaking engagements, events, production and distribution of materials describing various Best Management Practices, and participation in the countywide Green Business Recognition Program.

### **School and Youth Education**

More than 100 teacher packets for “It’s Wet, It’s Wild, It’s Water” were distributed, with a cumulative total to date of 838 packets. Staff participated in the third annual “Resources in Environmental Education Fair” for K-12 teachers, produced by Santa Clara Valley Environmental Partners. San Jose Park Rangers conducted 140 water awareness and storm drain pollution prevention programs for students in grades 4-6 during the school year. A poster was produced showing where residential wastewater comes from and how it ends up in the Bay. The Don Edwards San Francisco Bay Wildlife Refuge has been retained to develop a lesson plan for teachers to use with the poster. The newly produced “South Bay Water Recycling Curriculum for Middle School” includes a section on pollution prevention.

### III SPECIAL STUDIES

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#### III-A NICKEL SPECIATION PROGRAM

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The University of California - Berkeley completed special studies regarding the role of speciation in the treatment and environmental fate of nickel in December 1997. During the first half of 1998, this Plant-sponsored university research was reviewed and condensed into a final report. Major findings as a result of this research endeavor include:

- Most of the nickel discharged by the Plant and other wastewater treatment plants consists of strongly complex, dissolved species.
- At the Plant, the ligand responsible for complexation of nickel is the synthetic chelating agent ethylenediamine tetraacetic acid (EDTA).
- EDTA and NiEDTA<sup>2-</sup> are discharged to the Plant by both residential and industrial sources.
- The speciation of nickel in wastewater effluent and in surface runoff are different; nickel in wastewater consists mainly of relatively non-toxic NiEDTA<sup>2-</sup>; nickel in surface runoff consists mostly of weak and moderately strong nickel complexes.
- NiEDTA<sup>2-</sup> in wastewater discharged by the Plant does not significantly dissociate or degrade in San Francisco Bay.

The final report has been printed by the University. A copy of this report is in Appendix C. It is expected that this data will be used in the assessment of the impairment portion of the TMDL process.

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#### III-B AVIAN BOTULISM

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The Plant provides for the regular monitoring of Artesian Slough and Coyote Creek for the presence of avian botulism and other avian diseases. The San Francisco Bay Bird Observatory conducts this special avian monitoring. Prompt collection and disposal of the sick and dead vertebrates that are found in the surveyed area enable the detection and control of disease outbreaks. The monitoring period runs from May to November and 24 surveys are conducted during this period. The 1997 monitoring effort, while showing evidence of a small outbreak of bird disease of unknown origin did not indicate an outbreak of avian botulism.

A wildlife census is conducted during the surveys, yielding information on the numbers and types of vertebrates in the study area. The data show large fluctuations in the average monthly counts, which may be attributed to a number of factors that affect bird activity such as time of day, tides, and weather. Duck hunting, which is allowed in portions of the study area, also contributes to the large fluctuation in counts. Of special interest is the heron and egret breeding colony along the central portion of Artesian Slough, one of the largest and most diverse heron and egret breeding colonies in the state. The only other

location in California with this diversity is the Salton Sea. The Artesian Slough colony moved into a more densely vegetated, hard-to-reach area in 1995 and so, during 1995 and 1996, monitoring efforts to determine the numbers of breeding pairs that could be verified dropped significantly. However, greatly intensified search efforts in 1997 were able to verify numbers similar to 1994 levels. Annual reports are submitted to the Regional Board, California Department of Fish & Game, and US Fish and Wildlife Service.

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### III-C SITE-SPECIFIC OBJECTIVES AND TMDL DEVELOPMENT

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#### **Copper Water Effect Ratio (WER) Study**

The City of San Jose Environmental Services Department concluded a study on the development of a site-specific water effect ratio (WER) for copper in 1997. WER values at three stations in the South San Francisco Bay ranged from 2.5 to 10.2 and from 2.5 to 5.7 based on measured total and dissolved copper, respectively. Both total and dissolved WER values increased from north to south and were statistically significantly greater at the southern station (Coyote Creek) than at the two northern stations near Dumbarton Bridge. Increasing total copper WER values corresponded with increasing Total Suspended Solids and Total Organic Carbon. Dissolved copper WERs were less variable than those based on total copper and were not subject to seasonal changes in wind, rain, or suspended solids, as were total copper WERs. Results from the study provide strong evidence that the San Francisco Bay region-wide site-specific criterion proposed in 1993 (i.e.  $4.9 \mu\text{g}/\text{l}$  total copper) appears to be overly protective of the South Bay environment. Using EPA's WER methodology, appropriate site-specific criteria for copper in the South Bay range from  $6.9$  to  $7.5 \mu\text{g}/\text{l}$  dissolved copper. In June, the Plant formally submitted the technical data and requested an analysis and review of this data by the Regional Board, the State Board, and the US Environmental Protection Agency - Region IX. This data can be used to establish a site-specific objective for copper in the South Bay.

#### **Spatial and Temporal Trace Level Monitoring in South San Francisco Bay**

In February 1997, an ambitious monitoring program with unprecedented sampling frequency was initiated by the Plant to characterize water quality parameters in the South Bay at twelve sampling sites. These sites were selected to represent deep, mid-channel, shallow mudflats, and areas of significant stream influence. The purpose of this study is to describe spatial and temporal trends in water quality and ultimately develop a reliable database on which Total Maximum Daily Loads (TMDL) models can be based. Results through March 1998 reveal decreasing levels of ambient copper and nickel concentration in the extreme South Bay on a gradient northward. High total metal concentrations correlate with storm events (high wind). Levels of measured total copper and nickel correlate with Total Suspended Solids (TSS) and, to a lesser degree, with Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC). Total mercury values are highest near the confluence of Coyote and Guadalupe Creeks, possibly originating from abandoned cinnabar mines in the watershed. Results corroborate findings of the Regional Monitoring Program, studies conducted by the US Geological Survey, and San Jose's

1996/97 water effect ratio (WER) findings. San Jose will continue these monitoring efforts for the next six months and will evaluate the need for additional sediment sampling endeavors for the South Bay.

#### Calculation of TMDL for Copper and Nickel in South San Francisco Bay

The Regional Board has determined that water quality standards are currently being exceeded in the southern portion of San Francisco Bay in spite of extensive point source controls that have been in effect at wastewater treatment facilities. The Clean Water Act requires that, for such impaired water bodies, a Total Maximum Daily Load (TMDL) be established. A TMDL is a quantitative assessment of water quality problems, the sources contributing to the pollution, and the amount of reduction in individual pollutants that is required to meet water quality standards. This watershed-wide assessment addresses both point and non-point pollutant sources, such as urban runoff, upstream inputs, air deposition, and sediment re-suspension. The TMDL effort is being integrated into ongoing watershed management and stormwater control initiatives in the South Bay.

San Jose has secured the technical support services of a diverse team of experts in the areas of water quality, hydrodynamic modeling, public outreach, feasibility analysis, regulatory assessment, and information management. This team is led by Tetra Tech, a nationally recognized environmental contractor, which is charged with developing the TMDL process for copper and nickel in the South Bay. Research and monitoring will be conducted by local agencies as well as universities, and incorporated into the TMDL development process. To ensure technical excellence, a review committee consisting of local experts and nationally recognized scientists will be established. The overall TMDL process will be coordinated through the Watershed Management Initiative's community-based stakeholder process.

#### Nickel Acute-To-Chronic Ratio Study

In 1986, the U.S. Environmental Protection Agency (EPA) established the National Water Quality Criterion for marine nickel as 8.3 parts per billion (ppb). Special investigations conducted by the Plant on the toxicity of nickel in 1990-1991 indicated that there was valid scientific literature on which to base a recalculation of the national nickel criterion. In 1995, Plant research established a recalculated nickel value of 10.2 ppb, using EPA criteria amendment methods. These investigations also suggested that the lack of chronic toxicity data on marine species biased the national criterion development toward freshwater data.

When calculating Water Quality Criteria, acute toxicity test results are often translated to chronic toxicity protection with the use of a Final Acute-to-Chronic Ratio (FACR). In the case of nickel, two Acute-to-Chronic Ratios (ACRs) for freshwater species (35.58 and 29.86) were combined with one saltwater ACR (5.48) to produce the marine FACR of 17.99. The Plant hypothesized that it was probable that the toxicity responses that produce the ACRs are different in fresh and saltwater. Therefore, the Plant began studies in 1997 to determine the acute and chronic response of three local marine species (topsmelt, red abalone, and mysid shrimp) to nickel. From preliminary results, the new

criterion for nickel (combining the previous data with new study results) would be in the range of 11.8 to 14.7 ppb, depending on which marine species and chronic endpoints are used. If the fresh water ACR data is excluded, the resulting saltwater nickel FACR is calculated to be substantially higher. The Plant has presented a preliminary report with findings to the Regional Board in June 1998. The University of California - Santa Cruz will complete these special studies during the latter half of 1998.

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### III-D LOCAL EFFECTS MONITORING

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Local Effects Monitoring (LEM) studies have been conducted at a site in Coyote Creek near the discharge points for the San Jose/Santa Clara and Sunnyvale wastewater treatment plants since 1994. The US Geological Survey collects tissues from the marine clam *Macoma balthica* and sediments six times throughout the year. Sediment samples are analyzed for trace metals, grain size, and Total Organic Carbon (TOC). Tissues are analyzed for trace metals, mantle water salinity, and lipid content to determine the overall condition of the clams at time of sampling. The 1997 LEM concluded that "regional scale factors may be becoming more important than local point source inputs in controlling sedimentary and bioavailable concentrations of several elements of regulatory interest: Chromium, Nickel, Zinc, Selenium, and Copper; however this may not be completely accurate in all years." Inputs of mercury to the South Bay, presumably from abandoned cinnabar mines and carried in runoff during storm events, are believed to be the main sources of this toxic metal. Furthermore, the concentration of metals in sediments and tissue were similar to levels detected in similar matrices at a site near the Palo Alto wastewater treatment plant. The US Geological Survey is currently under contract to provide these services for 1998. The City will then evaluate the data and information collected to date during the first quarter of 1999 to determine future sampling requirements.

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### III-E MARSH MITIGATION STUDIES

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#### **Marsh Plant Comparative Studies**

The most recent comparative study of the South Bay marsh plant associations was completed in the fall of 1997. The results of analyses showed that no conversion of salt to fresh or brackish marsh had occurred since the last such study in 1996. A preliminary Habitat Evaluation Procedure (HEP) has been developed using the original values and timelines established in the 1989 analysis and applying them to the habitat values that were found in 1996 (when additional conversion was last detected) and 1997. The 1996 and 1997 studies found the Average Annualized Habitat Units (AAHU's) that need to be mitigated for are estimated to be the equivalent of approximately 30 acres. There was no appreciable marsh conversion from 1996 through 1997. When the original mitigation requirements were completed by purchasing and beginning restoration of the Moseley and Baumberg Tracts, a 10-acre bank of salt marsh was established at the Baumberg Tract.

This leaves 20 acres for additional mitigation. This is in addition to the NPDES permit requirement, Provision 6.1C, to maintain an adequate salt water marsh mitigation bank.

### **Marsh Conversion Studies**

As part of the ongoing effort to better understand the South Bay ecosystem and our impact on it, the Plant has retained a consultant to analyze the spatial extent and cause(s) of "tidal marsh conversion." The three major objectives of this study are to identify the following:

- Factors that control spatial and temporal variations in the distribution and abundance of salt-tolerant vegetation in the tidal marshlands along channels that may be impacted by effluent from the Plant;
- Historical, natural, and spatial extent of the influence of unimpaired local creek and river flows on the distribution and abundance of salt-tolerant vegetation in the tidal marshlands adjoining Coyote Creek and the Guadalupe River in Santa Clara County; and
- Appropriate ways to monitor the more important factors that control the distribution and abundance of salt-tolerant vegetation in the tidal marshlands.
- A final report from this consultant is expected in the Spring of 1999.



## IV INFRASTRUCTURE OPTIMIZATION

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### IV-A IN-PLANT RESEARCH STUDIES

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The January 1998 update included a summary of the results of the In-Plant Copper Reduction Research Program that was conducted between 1993 and 1998. The final recommendations of the program were as follows:

- Convert the existing two-stage Nitrification process into a single-stage biological nutrient removal (BNR) process. Monitor Plant reliability during and after conversion.
- Continue development of on-line monitoring and automatic control of treatment processes to enhance BNR process reliability.
- Complete pilot filter testing of the radial flow backwash method versus air scour and the existing backwash method. Retrofit and test one existing full-scale filter with anthracite monomedia, and selected backwash method for one year. Select best filter upgrade alternative based on full-scale testing results and upgrade all filters.
- Initiate fecal coliform study to demonstrate acceptability of alternative Plant effluent coliform limits. Terminate pre-filter ammonia and chlorine addition, and practice post-filter chlorination. Practice backwash water chlorination.
- Continue development of diversion of spent filter backwash water options.
- Investigate chemical addition options to prevent exceedance of filter effluent turbidity greater than 2 nephelometric turbidity units.

#### **IV-A1 Biological Nutrient Removal**

The Plant has developed a plan for converting Nitrification into a single stage BNR process. The preparation for conversion is underway and is expected to be complete by January 1, 1999.

Modeling of the BNR process as a training tool and as a tool for enhancing process control is in progress. Automatic Sludge Retention Time control of BNR in Nitrification is expected to be complete by January 1, 1999. Other automatic control loops are also being designed with the goal of enhancing reliability. Additionally, several new on-line turbidimeters are being piloted which may later be used to increase process reliability.

The Plant will monitor the combined full-scale BNR and filtration process over the next year and assess the need for any chemical additions to meet Title 22 reclaimed water requirements.

#### **IV-A2 Pre-Filter Chlorine Reduction**

The Plant has prepared a workplan for submittal to the Regional Board for startup of the Fecal Coliform study. Two issues that must be resolved prior to startup are being addressed; these are best management practices for on-site use of Plant effluent, and maintaining the reliability of the reclaimed water during the study period. It is planned that these issues will be resolved and the Fecal Coliform study started by November 1998. The backwash water chlorination system is currently under design, and construction should begin in Fall 1998. It has been previously reported that termination of prefilter chlorination may significantly impact the Plant's ability to meet current disinfection standards due to a loss of chlorine contact time through the filters. Therefore, testing of the filtration and disinfection systems without prefilter chlorine will proceed cautiously to ensure that the Plant continues to meet current permit requirements.

On-line monitoring of solids in the backwash water will be tested as a trigger for when to divert the backwash flow. Testing is planned for Fall 1998. Based on this testing, the diversion option will be revisited.

#### **IV-A3 Treated Filter Backwash Water (TBW) Removal**

Pilot filter testing of the radial flow backwash method versus air scour and the existing backwash method have been completed. The results were inconclusive. Implementation of alternative backwash methods in the full-scale filters are still being considered. The study of full-scale performance of monomedia versus dualmedia is being planned for startup in late 1999.

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### **IV-B HEADWORKS LOADING ANALYSIS**

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The 1998 Plant NPDES permit requires an updated headworks loading analysis. The first headworks loading analysis was conducted in 1993 to support the development of local limits. The results of that analysis were included in the Preliminary Local Limits Report, (November 1993). The original report is being reviewed to determine if the methodology used to quantify flows and pollutant concentrations from the residential and commercial sectors is still appropriate for the current effort. A workplan for the new study will be developed by December 1998, outlining the tasks necessary to appropriately determine loadings from major sectors.

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### **IV-C INFLOW IDENTIFICATION STUDY**

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A program is underway to investigate sources of storm water inflow into the sanitary sewer system. The workgroup will identify sources of inflow arising from drainage into exposed inlets to the sanitary sewer; illicit connections; and uncovered sanitary drains or clarifiers at commercial and industrial facilities; and from cross-connections within the public infrastructure. The workplan is to gather information on known cross-connections and to evaluate sanitary sewer flow monitoring data for areas of the collection system with

high wet weather flows. The results of this study will be an estimate of the amount of inflow that occurs during storm events, a prioritization of areas of the collection system for further investigation, and development of costs associated with the reconstruction of the collection system.

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#### **IV-D GROUNDWATER INFILTRATION REDUCTION PROGRAM**

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The problem of reducing groundwater infiltration (infiltration) into the sanitary sewer system has been divided into Short-Term Projects and Long-Term Projects.

##### **Short Term Projects**

The short-term or “quick fix” projects are non-structural pipe rehabilitation procedures intended to reduce infiltration in sewer systems for duration of 5-10 years as compared to structural rehabilitation procedures that are normally designed for 50-year life cycles. Non-structural procedures include the grouting of joints and manholes and the installation of various types of lining. The section of sewer lines to be rehabilitated will be identified and designated based on records of inspection, maintenance, and flow monitoring using closed circuit tv devices. Thus far, the following major locations have been identified as having significant amounts of infiltration:

1. The Downer-Canoas Basin, consisting of three sub-basins with estimated infiltration of 3.25 mgd. Workplan:
  - A. Flow monitoring of Downer-Canoas area suspected of having high infiltration (completed)
  - B. An analysis of flow monitoring data
  - C. CCTV work conducted to determine the number of pipe joints and manholes to be grouted
  - D. After completion of the above, the data will be used to prepare bidding documents for grouting of joints and manhole rehabilitation
  
2. The Monterey-Riverside 1-C, Sanitary Sewer Rehabilitation Project, consisting of approximately 8,000 lf of 48-inch and 54-inch RCP with estimated infiltration of 2.45 mgd. Workplan:
  - A. Plans, specifications and bidding for lining approximately 8,000 lf of 48-inch and 54-inch RCP in Santa Teresa Avenue (completed)
  - B. Award of construction contract in May 1998
  - C. Access pits to be excavated for CCTV and mandrel inspections (work is in progress in spite of high surrounding groundwater tables and heavy dewatering requirement)

- D. CCTV inspection and mandrel inspections to show pipe condition and aid in determining the quantity of lining required
- E. City of Santa Clara: rehabilitate cracked sewer lines at approximate cost of \$30,000 (completed)

### **Long Term Projects**

This program will consist of an infiltration study of the entire service area of the Plant.

Work to date includes:

- Contract (\$750,000) for Infiltration/Inflow Study for the San Jose area awarded to an engineering consultant firm in February 1998.
- Milpitas, Santa Clara, West Valley Sanitation District, and Cupertino are conducting their own infiltration study using consultants to reduce infiltration and to identify short- and long-term corrective measures.
- West Valley Sanitation District has completed Phase I of its study of older sewer lines subject to infiltration in the downtown Los Gatos area; rehabilitation work is ongoing

San Jose consultant has collected background information; compiled a GIS map showing groundwater elevations and sewer systems in the various sewer basins within the San Jose service area; and is working on plans to further subdivide the sub-basins into several smaller sub-basins for flow metering. The results of the flow monitoring and subsequent CCTV inspection will determine the severity of pipeline defects; the sewer lines will either be structurally rehabilitated, lined, or grouted.

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### **IV-E OPERATIONS AND MAINTENANCE MANUAL**

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A workplan for updating the Plant Operations and Maintenance (O&M) Manual is required to be submitted by December 1, 1998, by the 1998 NPDES permit. This manual will incorporate all plant improvement projects to date as well as provide information regarding maintenance activities, recommended strategies for operation, process control monitoring, and plant equipment. This update is proceeding as planned and is scheduled to be completed on time.

## V COOPERATIVE REGIONAL PROGRAMS

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### V-A URBAN RUNOFF MANAGEMENT PROGRAM

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On behalf of the tributary agencies, San Jose submitted the final draft of the Urban Runoff Management Plan to the Regional Board on September 1, 1997, per requirements of the NPDES stormwater permit issued in August 1995.<sup>1</sup> The draft Plan was revised based on comments received from the public and Regional Board during the period from March 1 to July 30, 1997. Final determination on the suitability of the Plan was received from the Regional Board on July 10, 1998, in a letter stating that the report had progressed significantly and was conditionally acceptable. Activities performed under the Plan are documented in the Annual Report submitted on September 1 each year. For more information regarding the storm water program, please refer to the upcoming annual report dated September 1998.

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### V-B WATERSHED MANAGEMENT INITIATIVE

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Progress on the Santa Clara Basin Watershed Management Initiative is proceeding apace. Over the last six months, several important milestones have been achieved, including:

- Core Group adoption of goals for the Initiative processes.
- The adoption of a “signatory document” to formalize Core Group representation and decision-making process.
- Initiation of the development of the Watershed Assessment Report.

These actions provide a solid framework for the development and implementation of a Watershed Management Plan to achieve both short- and long-term goals of the Basin’s stakeholders.

#### **Goal Setting**

Although stakeholder interests had been identified early in the process, more work was needed to establish common ground among these diverse interests to provide clear direction for future activities. To achieve consensus on its goals, the Core Group decided that facilitation was the best course. San Jose provided the funding and, through the Resource and Planning Subgroup, managed the consultant selection process for the Goal Setting Facilitation. As a result of this facilitation process, held in April, a new mission statement and six main goals were adopted by the Core Group. These are:

**Mission:** Protect and enhance the Watershed, creating a sustainable future for the community and the environment.

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<sup>1</sup> NPDES Permit No. CAS029718, issued by the Regional Board -- Order 95-180, August 23, 1995

**Goals:**

1. Ensure that the Watershed Management Initiative is a broad, consensus-based process.
2. Ensure that necessary resources are provided for the implementation of the Watershed Management Initiative.
3. Simplify compliance with regulatory requirements without compromising environmental protection.
4. Balance the objectives of water supply management, habitat protection, flood management and land use to protect and enhance water quality.
5. Protect and/or restore streams, reservoirs, wetlands and the Bay for the benefit of fish, wildlife and human uses.
6. Ensure that the Watershed Management Plan incorporates science and is continuously improved.

These goals provide a framework from which measurable objectives will be developed. With the goals in place, the Subgroups are currently re-examining their charters and work plans to ensure that they are aligned with the goals of the process, and developing objectives that will enable progress to be measured.

**Signatory Document**

The Core Group has been operating under an informal set of ground rules and principles that have evolved over the last two years. While this approach has provided the flexibility needed to enable the Core Group to develop its unique structure for participation and decision-making, the cities and the Santa Clara Valley Water District felt that a more formal structure would provide a better basis for implementation of Core Group recommendations. With the aim of providing this structure, the Communications Subgroup developed the Signatory Document that incorporates Core Group goals (see above); and sets forth the purpose of the Core Group, its tasks and responsibilities, membership, decision-making process and ground rules for participation.

The document was reviewed by legal counsels of various member agencies and adopted at the June 1998 Core Group meeting. Members have committed to taking the Document to their respective legislative Councils or organizational Boards for signature. To date, the document has been signed by the Regional Board, EPA - Region IX, the Santa Clara Valley Water District Board, Guadalupe-Coyote Resource Conservation District Board, California Department of Fish and Game, and the Santa Clara Valley Manufacturing Group. Once all participating agencies and organizations have signed, the Signatory Document will serve to guide all future Core Group actions such that its recommendations can receive formal recognition by legislative and organizational bodies. Ultimately, this will serve to add weight to such recommendations and further ensure that they are given full consideration for implementation funding and resources.

### **Watershed Assessment Report**

A driving force for solidifying the overall WMI structure and goals has been the need to begin development of the Watershed Management Plan. In October 1998, the Core Group chairs recommended that a small team with experience in watershed planning and project management be convened for the purpose of preparing the Plan. The Report Preparation Team, comprised of staff from San Jose, the Water District and consultants from Sunnyvale and Palo Alto, developed a "Road Map" for Plan development based on an early work plan developed by the Watershed Assessment Subgroup. This Road Map envisions a three-phase process beginning with the development of a Watershed Assessment Report, followed by a State of the Watershed Report and a Watershed Management Plan.

Using the consensus-based principles formalized by the Signatory Document, the Team developed an outline for the Watershed Assessment Report and a work plan specifying the tasks needed to complete the Report. In March, the Team proposed several schedule alternatives for Plan development that were linked to the regulatory drivers underlying the WMI process. Based on these drivers, the Core Group opted for an accelerated schedule calling for Report completion in late 1999. Given the decision for this completion date, the Core Group approved the concept of retaining a consultant to assist Subgroups with preparation of the Assessment and the State of the Watershed Report. The City and the District committed to funding this approach, and the Core Group selected a consultant in May.

Currently, specific work plan tasks for the consultant and the Subgroups are being finalized by the Team. With in-kind staff and financial assistance from San Jose, the Plant, Sunnyvale, Palo Alto, the Water District, and the Santa Clara Valley Urban Runoff Pollution Prevention Program, work by the consultant and the Subgroups is expected to proceed in July 1998. Once work on the Report has begun, the Team will concentrate on laying out the process for developing the State of the Watershed Report – the next phase of the watershed planning process -- targeted for completion in the year 2000. The goal is to begin the century with a vision for a sustainable future for the Basin's streams, wetlands and Bay.

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### **V-C REGIONAL MONITORING PROGRAM**

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The Regional Monitoring Program (RMP) is a comprehensive monitoring program assessing sediment and water quality parameters, as well as toxicity, in San Francisco Bay and Delta. Monitoring is performed three times per year (February, April, and July). Two additional stations in the southern end of the Bay are monitored in cooperation with the Regional Board, the San Francisco Estuary Institute (SFEI), the Plant (station C-3-0) and Sunnyvale (station C-1-3). Concentrations of total and dissolved trace metals in water had higher concentrations in these South Bay creek stations. The 1996 RMP Annual Report found no toxicity to *Mytilus* and *Mysidopsis* in the water column. Sediments in Coyote Creek contained levels of certain organic compounds (PCBs, DDTs, chlordanes,

and dieldrin) compared to most monitoring stations throughout the Bay. The City will continue this special study through 1998. As in previous years, the merits of these special investigations are used to determine the need for future monitoring.

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#### V-D SUNNYVALE DIVERSION PROJECT

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San Jose and Sunnyvale staff jointly investigated a short-term diversion of Cupertino's inflow for a period of five years at four diversion levels, ranging from 1 mgd to 3.7 mgd. This analysis was then compared to potential flow reductions and costs associated with the Inflow and Infiltration (I&I) projects.

This comparative evaluation demonstrated that it is more cost effective to expand the I&I repair work than it is to divert flow to another facility for treatment. In addition, the heavy rains of this year demonstrated (and possibly exacerbated) the extent to which I&I contributes to increasing flows to the Plant. The 1997 Revised South Bay Action Plan estimated flow reduction produced by I&I projects to be 8 mgd. Funding sources previously identified for the Sunnyvale - Cupertino Diversion project will instead be used for the expanded I&I project. Total funding in the proposed 1999-2003 five-year CIP for the I&I Reduction Project is \$25,370,000. This change will accelerate I&I flow savings.

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#### V-E MARSH MITIGATION PROJECTS

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Two wetlands mitigation projects, the Baumberg and Moseley Tracts, were implemented to satisfy Regional Board Order No. 93-117. The provisions of this Order required the City to mitigate for 380 acres of salt marsh habitat in the extreme southern reaches of San Francisco Bay which had experienced effluent discharge-related degradation between 1970 and 1985.

##### **Baumberg Tract Restoration Project**

The City entered into a cost-sharing agreement with the State and other agencies for the purchase and restoration of the 815-acre Baumberg Tract. The final draft Restoration and Management Plan is scheduled for completion this fall, with environmental permit applications to be submitted by early spring of 1999. The East Bay Regional Parks District has been hired by the State to oversee and manage all construction-related activities for the Project. The restoration work is scheduled to begin in Summer 1999.

##### **Moseley Tract Restoration Project**

The City acquired the Moseley Tract from the Port of Oakland in September 1996 and plans to implement a passive tidal restoration to this 54-acre diked seasonal wetlands, which historically was used as a duck club by the Moseley family. The City presented the Moseley Tract Tidal Marsh Restoration Project to the U.S. Army Corps of Engineers at their February 1998 interagency meeting to receive initial input from the Project's



regulatory and permitting agencies. That same month, unprecedented rainfall and extremely high tides precipitated very high stormwater runoff volumes and a breaching of the bayside earthen levy on the site. These *El Nino*-related events resulted in localized flooding of the frontage road on either side of the Highway 84 right-of-way. The City, coordinating with local agencies and adjacent landowners, received an emergency permit with BCDC for sandbagging of the levy to minimize inundation of the site during high tides. Water pumps were also employed to lower water levels below the frontage road pavement elevation.

The City hired consultants for the survey mapping and Project design, permitting and engineering services in June 1998, with restoration scheduled to begin this year. However, due to the *El Nino*-related events described above, and the unusually high water levels which remain in the site, the actual "dirt work" required for the Project may have to be postponed until the summer of 1999.

#### **Tidal Salt Marsh Mitigation Alternatives Project**

On September 17, 1997, the Regional Board adopted Order No. 97-111, which requires San Jose to submit a plan for mitigation of wetlands losses caused by the Plant's discharge subsequent to 1985.

On April 29, 1998, the City submitted the "Tidal Salt Marsh Mitigation Plan" to comply with this Order and in June 1998 received a letter of Plan acceptance from the Regional Board's Executive Officer. This acceptance was provided on condition that the City perform the activities described in its Plan, including an annual assessment of salt marsh conversion and submittal of a Mitigation Alternative Feasibility Report by January 15, 1999. The City has begun the 1998 salt marsh conversion assessment (as was performed for the last three years), with results anticipated by November.

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#### **V-F BAY AREA REGIONAL WATER RECYCLING PROGRAM**

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The Bay Area Regional Water Recycling Program (BARWRP) is a multi-year effort to identify opportunities for optimum regional reuse of recycled water. The program is sponsored by the US Bureau of Reclamation, the Bay Area Dischargers Association, and more than a dozen water and wastewater agencies in the nine-county San Francisco Bay Area.

San Jose, on behalf of the tributary agencies, has been an active participant since the program commenced in 1993, and City staff are involved in leadership roles in both technical and management committees. Master planning work for South Bay Water Recycling (including Phase 2 program development) has been identified as an important demonstration of regional implementation of water reuse.

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## V-G CALFED

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CALFED is a statewide interagency effort to develop a long-term solution to the decline of ecosystem quality, water supply reliability, water quality, and levee system integrity in the San Francisco Bay-Delta region.

San Jose's stake in CALFED is considerable since over half of its water supply is imported from the Delta. The Administration recently submitted comments on the Phase 2 Draft CALFED Bay-Delta Programmatic EIR/EIS. It was recommended that CALFED provide adequate support for management-oriented solutions in the areas of ecosystem restoration, water reuse and efficiency, water quality, water transfers, watershed management, and long-term levee protection prior to approving new storage and conveyance facilities. These recommendations are generally consistent with those of other South Bay region stakeholders, including the Santa Clara Valley Water District.

CALFED was also advised to provide adequate support for City-sponsored flow reduction and ecosystem restoration efforts. The Administration helped prepare a funding proposal to CALFED's ecosystem restoration program on behalf of the Santa Clara Valley Basin Watershed Management Initiative to support stream monitoring, stakeholder involvement, and creation of a watershed management plan.



## **APPENDIX A**

Group 1 Dischargers' Mass Audit Study Projects and Mass Loading for Copper and Nickel and Load Summary for Group 2 Dischargers

Table A-1: Mass Loading for Group 1 Dischargers for Copper

Table A-2: Mass Loading for Group 1 Dischargers for Nickel

Table A-3: Load Summary for Group 2 Dischargers

## **APPENDIX B**

Outreach for Pollution Prevention

## **APPENDIX C**

The Role of Speciation in the Removal of Nickel by the San Jose/Santa Clara Water Pollution Control Plant and its' Fate in San Francisco Bay

## **APPENDIX D**

### Printed Material Describing Best Management Practices

- Table D-1: List of outreach materials currently available for use by the City Staff
- Table D-2: List of printed materials distributed through the Speakers' Bureau during this reporting period
- Table D-3: List of printed materials distributed by the City Inspectors in the Illicit Connections/Illegal Discharges (IC/ID) Program
- Table D-4: List of materials developed for the City

## **APPENDIX E**

Industrial User Newsletter, the *Tributary Tribune*, Winter and Spring '98 editions