

Montara Sanitary District Water Conservation Program

2003 Urban Water Conservation Program Grant Application

December 3, 2002

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***Application Part A — Project
Description, Organizational, Financial
and Legal Information***

A-2 Application Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.



Signature

George F. Irving, District Manager
Name and title

12/01/2002
Date

A-3 Application Checklist

Complete this checklist to confirm all sections of this application package have been completed.

Part A: Project Description, Organizational, Financial and Legal Information

- A-1 Urban Water Conservation Grant Application Cover Sheet
- A-2 Application Signature Page
- A-3 Application Checklist
- A-4 Description of project
- A-5 Maps
- A-6 Statement of work, schedule
- A-7 Monitoring and evaluation
- A-8 Qualification of applicant and cooperators
- A-9 Innovation
- A-10 Agency authority
- A-11 Operation and maintenance (O&M)

Part B: Engineering and Hydrologic Feasibility (construction projects only)

- B-1 Certification statement
- B-2 Project reports and previous studies
- B-3 Preliminary project plans and specifications
- B-4 Construction inspection plan

Part C: Plan for Environmental Documentation and Permitting

- C-1 CEQA/NEPA
- C-2 Permits, easements, licenses, acquisitions, and certifications
- C-3 Local land use plans
- C-4 Applicable legal requirements

Part D: Need for Project and Community Involvement

- D-1 Need for project
- D-2 Outreach, community involvement, support, opposition

Part E: Water Use Efficiency Improvements and Other Benefits

- E-1 Water use efficiency improvements
- E-2 Other project benefits

Part F: Economic Justification, Benefits to Costs Analysis

- F-1 Net water savings
- F-2 Project budget and budget justification
- F-3 Economic efficiency

Appendix: Benefit/Cost Analysis Tables

- Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

A-4 Description of Project

The Montara Sanitary District's Water Conservation Program is based on implementing the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) Best Management Practices (BMPs). These BMPs are proven to be cost-effective in other Northern California communities and specifically among San Francisco Bay Area water agencies.

Proposition 13 funding is being requested to cost-share three (3) fiscal years (2003/04, 2004/05, and 2005/06) of the following two components of the District's Water Conservation Program involving replacement of existing water using appliances:

1. Residential Ultra Low Flush Toilet (ULFT) Replacement (BMP 14)
2. High-Efficiency Washing Machines (BMP 6)

The intent of the District's Water Conservation Program is to generate turnover of water inefficient fixtures. The goal of the District's program is to achieve a market penetration of 50% of the existing fixtures. For the MSD service area, this represents installation of 1,000 ULFTs and replacement of 800 washing machines. Marketing of the program will be to all residences as the housing stock consists primarily of pre-1992 construction with older, inefficient water fixtures. The program is planned as a rebate program (see Part A-6) and installations will be tracked to ensure compliance and evaluate savings (see Part A-7).

An estimated 657 acre-feet of water is expected to be conserved over the life of the new toilets (20 years) and washing machines (15 years). These savings will increase the reliability of the existing water supply and provide economic benefits to the District and its customers.

Non-economic benefits accrue as a result of alleviating existing demands on the local groundwater and surface water supply sources. The District's Water Conservation Program is designed to achieve "real" water conservation and offers the ability to promote the ecosystem health of nearby marine sanctuaries.

A-5 Maps

The Montara Sanitary District (District) is a public agency providing sanitary services to the communities of Moss Beach, Montara, and surrounding areas, on the northern San Mateo County coast, commonly referred as the Midcoast. The communities are located approximately 20 miles from San Francisco along Highway 1.

In 1991, the State Legislature granted the District with the powers of a County Water District, subject to a majority vote of the electors of the District, in accordance with Section 6512.7 of the Health and Safety Code. The measure passed with 84.6 percent of the vote (per Measure V on 4/6/01). According to the California Water Code Sections 31020 and 31021, “a district may do any act necessary to furnish sufficient water in the district for any present or future beneficial use”. In addition, “a district may store water for the benefit of the district, conserve water for future use, and appropriate, acquire, and conserve water and water rights for any useful purpose”.

Currently, a private investor-owned utility company provides water services to the communities of Montara, Moss Beach, and other adjacent communities. There are 1640 connections (mostly single family residential) serving approximately 5,412 people. The current water supply of the Montara system is inadequate for the current needs of the retail customers. The District has initiated efforts to assist in the development of a supplemental water supply for the Montara area; in addition the District is developing a Water Conservation Program as one of the components of developing a future water supply for the water users.

The map of the service area is included as Attachment 1.

A-6 Statement of Work, Schedule

The District’s Water Conservation Program is designed as a rebate program whereby customers are offered rebates to replace all older toilets in residences (\$50 rebate per toilet), and to replace existing washing machines with high water efficiency units (\$150 rebate per washing machine). Table A-1 presents a summary of the program work plan and schedule developed for each year of the program.

Table A-1 Water Conservation Program Schedule

Task Number	Task Description	Schedule	Fiscal Year 2003/04	Fiscal Year 2004/05	Fiscal Year 2005/06
1	<u>Marketing</u> Mail program info to all residential accounts	Nov	\$1,000	\$1,000	\$1,000
2	<u>Device Installation by Customer</u>	Nov - Apr	No cost to District	No cost to District	No cost to District
3	<u>Pay Rebate</u> ULFT rebate Washing machine rebate	Dec - May	\$16,650 \$39,900	\$16,650 \$40,050	\$16,700 \$40,050
4	<u>Post-Install Verification</u> Inspect random 10% of installations	Jan - Jun	\$1,000	\$1,000	\$1,000
5	<u>Project Administration</u> Distribute rebate applications Process rebates Log installations into database Post-install water use analysis	Jul - Apr	\$ 4,000	\$10,000	\$10,000

Table A-2 shows the quarterly expenditure projection over the course of each fiscal year.

Table A-2 Water Conservation Program Expenditures

Fiscal Year	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Total
2003/04	\$ 0	\$20,850	\$27,550	\$14,150	\$62,550
2004/05	\$ 6,870	\$20,610	\$27,480	\$13,740	\$68,700
2005/06	\$ 6,875	\$20,625	\$27,500	\$13,750	\$68,750

A-7 Monitoring and Evaluation

Program costs will be monitored and evaluated on a monthly and quarterly basis through the use of specific charge codes set up for labor and non-labor expenditures. Costs associated with BMP 6 and BMP 14 will be tracked separately in two Water Conservation Program database files established by the District.

Program results will be monitored by individual participant and in aggregate. Customers will receive rebates only after they provide proof of purchase and installation of the water-conserving device (ULFT or a high-efficiency washing machine). Program mailings can be repeated as needed to keep participation levels on target with the annual program goals.

All replacement program results will be logged in to a Water Conservation Program database. This database will be structured to provide a convenient and efficient way to track overall progress, customer response, and perform evaluations of program effectiveness and savings.

Additionally, a post-installation water use analysis will be conducted using pre- and post-retrofit comparison of water usage. Formal reporting on this program will occur in the next update to the water system's Urban Water Management Plan. Periodic updates on the District's Water Conservation Program will be mailed to the customers.

A-8 Qualifications of the Applicant and Cooperators

Mr. George Irving, the General Manager of the District will be the project manager for this program. The combination of Mr. Irving's experience in running grant-funded programs, his educational background, and his experience managing the District will ensure successful execution of the program. A copy of Mr. Irving's resume is attached as Attachment 2.

A-9 Innovation

The approach to water conservation taken by the District in this program can serve as a model for other small water systems. The District desired to make the existing system more efficient without requiring a large staff to implement. By examining the service area characteristics, the District could readily pinpoint the most productive BMPs. First, since the cost to produce and deliver water is among the highest in the region, even modest amounts of savings from water conservation practices would be cost-effective to implement. Second, consumption records for the last several years indicate that the annual average per capita use ranges consistently between 60 and 70 gcd. Thus, programs focused on demand reduction of interior uses are likely to have the most impact. The choice of ULFT's and high-efficiency washers was based on the proven track record of these devices to maintain demand reduction over an extended timeframe. Using an incentive-style program simplifies the District's administrative burden. Finally, the currently high interest of the local community on the water system needs is served by offering a program nearly every customer can access.

A-10 Agency Authority

1. The District Manager has the legal authority to submit an application and enter into funding contract with the State. A copy of the District resolution scheduled to be adopted at the December 5, 2002 Board meeting will be forwarded under separate cover.
2. The District was granted the powers of a county water district under the Section 6512.7 of the Health and Safety Code of the State of California. The District's power as a sanitary district is based on Sanitary District Act of 1923 as set forth in Section 6400 of the Health and Safety Code.
3. The District is not required to hold an election before entering into a funding contract with the State.
4. The funding agreement between the District and the State is not subject to review or approval from other government agencies.
5. There is no pending litigation that may significantly impact the financial condition of the applicant, the operation of the water facilities or its ability to complete the proposed project.

A-11 Operations and Maintenance

(Required for construction projects only, including meter installations.)

No construction activities are included as part of this project.

Application Part B—Engineering and Hydrologic Feasibility

(Application Part B required for construction projects only, including meter installations.)

No construction activities are included as part of this project.

B-1 Certification Statement

B-2 Project Reports and Previous Studies

B-3 Preliminary Project Plans and Specifications

B-4 Construction Inspection Plan

Application Part C—Plan for Completion of Environmental Documentation and Permitting Requirements

This project is not subject to CEQA or NEPA.

C-1 CEQA & NEPA

C-2 Permits, Easements, Licenses, Acquisitions, Certifications

C-3 Local Land Use Plans

C-4 Applicable Legal Requirements

Application Part D- Need for Project and Community Involvement

D-1 Need for the Project

The “Montara Water Supply Study” (DWR 1999) was a cooperative effort between the District and DWR as part of DWR’s Central California Water Management Program. DWR examined technically feasible options for improving water supply reliability within the coastal communities, including Montara. The study noted the following needs:

- The Montara water system is inadequate for the current level of development. Water needs exceed the available water supply, including peak demand periods. The capacity inadequacies are related both to infrastructure and water sources.
- In addition to the existing system shortage, there is also a small amount of future demand expected to occur over the next 30 years.

In recognition of the current water system condition, the California Public Utilities Commission (CPUC) has maintained a moratorium on new connections to the system in a series of decisions dating back to 1976. Recently, the CPUC also specifically ordered that a ULFT rebate program be initiated in the service area (per Application 00-10-049 dated 9/20/01).

A number of water supply development options to augment the Montara area supply appear to be feasible. Feasible options include local surface water development, groundwater development, desalination, and negotiation of a water transfer. Groundwater development and negotiation of a water transfer were identified as the most favorable approaches by the DWR report. However, the DWR report noted that water development in and around the Montara area has historically been very difficult. Water resources are limited, water development can be competitive, and anti-growth sentiment is significant. Thus, water management activities with broad based support (such as water conservation) were strongly encouraged to ensure successful resolution of the current situation.

D-2 Outreach, Community Involvement, Support, Opposition

The ULFT component of the program has been specifically identified by the California Public Utilities Commission as essential to the resolution of current water system problems. Also, there is a high level of community interest in the water system as evidenced by the passage of Measure V in 2001. There is no known opposition to instituting a water conservation program in the service area.

Customers in the service area receive power from the Pacific Gas and Electric Company system. PG&E has an existing incentive program for customer purchase of energy efficient washing machines. The District's water efficient washer rebate will be coordinated with PG&E's program for maximum impact.

Application Part E—Water Use Efficiency Improvements and Other Benefits

E-1 Water Use Efficiency Improvements

Replacement of older toilets (3.5 gallons per flush or more) with ULFTs (1.6 gallons per flush) and nonconserving washing machines with high-efficiency models improves water use efficiency through demand reduction. Consequently, the same amount of customers can be served with less treated water. The unused demand can be used to increase the reliability of existing supplies and can offset the need for some future supplies.

E-2 Other Project Benefits

In addition to the direct benefits the water supplier will receive from implementing the program, other parties also benefit. The customers receive a direct benefit from reduced volume charges for water and wastewater service. They also gain from reduced maintenance costs by replacing older fixtures with new ones.

There is also a current moratorium on new connections to the local sewer system. Water demand reduction would help with resolution of the existing sewer system problems.

The program offers the ability to promote the ecosystem health of highly sensitive marine habitats. The coast along the Montara service area and the neighboring communities is located within the Monterey Bay Sanctuary. Moreover, the coastline at Montara and Moss Beach is part of the James Fitzgerald Marine Reserve.

Application Part F – Economic Justification: Benefits to Costs

F-1 Net Water Savings

This program creates a net water savings by reducing water losses that are currently going to an “unusable” destination from an already-developed primary water source or sources. In the District’s service area, reducing existing customer demand reduces losses to a saline water body (the Pacific Ocean) through surface flows (via wastewater treatment plant discharge).

The expected volume of water to be saved by the program is 657 acre-feet over the life of the toilets (20 years) and washing machines (15 years). Table F-1 summarizes the calculation of these savings.

Table F-1 Water Conservation Program Savings

Item	Quantity	Basis
Residential ULFT Rebates		
Total system connections	1640	2001 system data
SF residential connections	1600	San Mateo Co. housing statistics for Midcoast communities
Pre-1980 dwelling units	1600 d.u.	Moratorium on new connections in effect since 1976
Household density	3.34 persons/d.u.	San Mateo Co. demographic statistics for Midcoast communities
Toilet density	2 toilets per d.u.	Housing stock > 2 bdrm
Unit savings	41.9 gpd/d.u.	CUWCC MOU Exhibit 6
Total SF toilets	3200	
Natural replacement rate	4.0 %	CUWCC MOU Exhibit 6
Toilets already replaced	1088	Over 1992 – 2002 period
Replacement goal	1000	50% of remaining old toilets
Total Program Savings	469 acre-feet	CUWCC MOU Exhibit 6 Low end of toilet life range (20 years)
Washing Machine Rebates		
Total system connections	1640	2001 system data
SF residential connections	1600	San Mateo Co. housing statistics for Midcoast communities
Unit savings	5,100 gal/year/washer	CUWCC MOU BMP 6
Replacement goal	800 washers	50% of old washers

Total Program Savings	188 acre-feet	Estimated 15 year appliance life
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F-2 Project Budget and Budget Justification

This specific grant request is not for replacement of existing funding for an ongoing program. This grant will create an incentive program addressing demand reduction among existing customers.

Table F-2 summarizes the proposed program budget over the project life.

Table F-2 Water Conservation Program Budget

Budget Item	Basis	FY04	FY05	FY06
Marketing	Printing & postage @ \$0.65 per SF account	\$ 1,000	\$ 1,000	\$ 1,000
Post-install verification	1/2 hour per site @ \$32/hr	\$ 1,000	\$ 1,000	\$ 1,000
Project administration	10 min. per site @ \$40/hr	\$ 4,000	\$ 4,000	\$ 4,000
Post-install analysis	Consultant report @ \$120/hr	\$ 0	\$ 6,000	\$ 6,000
Toilet rebate	\$50 per toilet	\$ 39,900	\$ 40,050	\$ 40,050
Washer rebate	\$150 per washer	\$ 16,650	\$ 16,650	\$ 16,700
TOTAL		\$ 62,550	\$ 68,700	\$ 68,750

F-3 Economic Efficiency

The economic analysis was performed from the local (District) perspective. If found to be cost-effective at this level, the impacts of including economic benefits accruing to all parties will only serve to increase the benefit to cost ratio. As discussed in Part E-2, direct economic benefits will result for the District and program participants. Indirect economic benefits accrue to the local sewer agency and programs addressing enhancement of local marine habitats.

Analysis assumptions

The following assumptions have been used in determining the benefits and costs for the proposed project:

- **Period of Analysis.** The program is a capital outlay project involving rebates for the purchase and installation of ultra low flush toilets (with a conservatively estimated life of 20 years) and high-efficiency washing machines (with an average life of 15 years).
- **Inflation and Escalation.** For ease of analysis, the District assumes zero future inflation and escalation of avoided costs.

- **Discount Rate.** Because benefits and costs of projects are evaluated over a period of time based on the life of the project, they must be discounted to reflect the value of money over time (a dollar received today is worth more than one received in the future). A 6 percent discount rate is used for consistency with DWR guidelines.
- **Dollar Value Base Year.** All benefits and costs are expressed in current year dollars (FY03).
- **Multiple-Funded Projects.** The economic analysis is conducted for the entire project, regardless of funding sources. All project costs (capital and O&M) are included in the economic analysis.

Project costs (see Tables 1, 2, and 3). Project costs usually include capital (construction) and annual operation and maintenance (O&M) costs. The economic analysis is being performed from the utility perspective, which includes marketing, materials, labor, administration, and overhead. All costs required to achieve project benefits are included in the economic evaluation. The project extends over three fiscal years, so costs are presented on a fiscal year basis.

Project benefits (see Table 4). The value of the project benefits is calculated based on the total avoided costs resulting from the volume of water saved over the life of the replaced fixtures. The water saved in any given year is associated with the last increment of supply to be utilized (usually the most costly source). In the District's case, the current source of supply is primarily pumped from local groundwater aquifers and supplemented with a small amount of locally treated surface water.

- **Avoided Cost of Current Supply Source** (see Table 4a). The avoided costs of the existing source of supply are based on current variable (quantity dependent) costs as derived from the customer commodity charge. This methodology accounts for the blending of costs from both sources of supply.
- **Alternative Cost of Future Supply Sources** (see Table 4b). The costs the District would incur if an alternative supply project is implemented instead of the proposed project are associated with the variable (quantity dependent) costs of utilizing additional groundwater, which is the near-term supply project recommendation from the most recent water master plan (Montgomery-Watson, 2000). For simplicity of analysis, the variable costs are assumed to be comparable to current levels and all savings benefits are attributed to the avoided cost of the current supply source (Table 4a).
- **Water Supply Vendibility** (Table 4c). This is \$0 as no water sale is being considered as a result of this project.

Sensitivity analysis. The economic analysis was tested for sensitivity regarding the assumption of net variable unit costs. Even if the net variable costs were half of the derived rate used in the analysis, the benefit-to-cost ratio would still remain strongly positive (1.4).

Appendix- Benefit/Cost Analysis Tables

Table 1: Capital Costs

Table 2: Annual Operations and Maintenance Costs

Table 3: Total Annual Costs

Table 4a: Water Supply Benefits: Avoided Cost of Current Supply Sources

Table 4b: Water Supply Benefits: Alternative Cost of Future Supply Sources

Table 4c: Water Supply Benefits: Water Supplier Revenue (Vendibility)

Table 4d: Total Water Supply Benefits

Table 5: Benefit/Cost Ratio

Table 1 Multi-family Toilet Replacement Program Capital Costs

Budget Item	Basis	FY04	FY05	FY06
Total ULFT costs	See Table F-2	\$ 43,183	\$ 46,333	\$ 46,333
Total washer costs	See Table F-2	\$ 19,367	\$ 22,367	\$ 22,417
TOTAL		\$ 62,550	\$ 68,700	\$ 68,750
Capital Recovery Factor @ 6%	ULFTs over 20 years Washers over 15 years	0.0872 0.1030	0.0872 0.1030	0.0872 0.1030
Annualized Capital Costs	ULFTs Washers	\$ 3,766 \$ 1,995	\$ 4,040 \$ 2,304	\$ 4,040 \$ 2,309

Table 2 Annual Operations and Maintenance Costs

Administration (a)	Operations (b)	Maintenanc e (c)	Other (d)	Total (e)
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

Notes: All O&M costs of the installed fixtures are the responsibility of the customer.

Table 3 Total Annual Costs

Annual Capital Costs (1) (a)	Annual O&M Costs (2) (b)	Total Annual Costs (c) (a+b)
ULFTs = \$ 11,846	\$ 0	\$ 11,846
Washers = \$ 6,608	\$ 0	\$ 6,608

(1) From Table 1 (FY04 + FY05 + FY06)

(2) From Table 2

Table 4 Water Supply Benefits

Net water savings (acre-feet/year) ULFTs = 23.45 AFY, Washers = 12.53 AFY (from Table F-1)

4a. Avoided Costs of Current Supply Sources

Variable Cost Components	Variable Costs (\$/AF)	Annual Avoided Toilet Costs (\$)	Annual Avoided Washer Costs (\$)	Total Annual Avoided Costs (\$)
(a)	(b)	(c) (b x 23.45 AFY)	(d) (c x 12.53 AFY)	(e) (c + d)
Variable commodity charge	\$ 1,858			
Private utility rate of return (10%)	<\$ 186>			
Fixed costs recovered in commodity charge (10%)	<\$ 186>			
NET VARIABLE COST	\$ 1,486	\$ 34,847	\$ 18,620	\$ 53,467

4b. Alternative Costs of Future Supply Sources

Variable Cost Components	Variable Costs (\$/AF)	Annual Avoided Toilet Costs (\$)	Annual Avoided Washer Costs (\$)	Total Annual Avoided Costs (\$)
(a)	(b)	(c) (b x 23.45 AFY)	(d) (c x 12.53 AFY)	(e) (c + d)
Variable commodity charge	\$			
Private utility rate of return (10%)	<\$ >			
Fixed costs recovered in commodity charge (10%)	<\$ >			
NET VARIABLE COST	\$	\$	\$	\$

4c. Water Supplier Revenue (Vendibility)

Parties Purchasing Project Supplies (a)	Amount of Water to be Sold (b)	Selling Price (\$/AF) (c)	Expected Frequency of Sales (%) (1) (d)	Expected Selling Price (\$/AF) (e) (c x d)	"Option" Fee (\$/AF) (2) (f)	Total Selling Price (\$/AF) (g) (e + f)	Annual Expected Water Sale Revenue (\$) (h) (b x g)
Total							

- (1) During the analysis period, what percentage of years are water sales expected to occur? For example, if water will only be sold half of the years, enter 50% (0.5).
- (2) "Option" fees are paid by a contracting agency to a selling agency to maintain the right of the contracting agency to buy water whenever needed. Although the water may not be purchased every year, the fee is usually paid every year.

4d: Total Water Supply Benefits

(a) Annual Avoided Cost of Current Supply Sources (\$) from 4a, column (e)	\$ 53,467
(b) Annual Avoided Cost of Alternative Future Supply Sources (\$) from 4b, column (e)	\$ 0
(c) Annual Expected Water Sale Revenue (\$) from 4c, column (h)	\$ 0
(d) Total Annual Water Supply Benefits (\$) (a + b + c)	\$ 53,467

Table 5 Benefit/Cost Ratio

Project Benefits (\$) (1)	\$ 53,467
Project Costs (\$) (2)	\$ 18,454
Benefit/Cost Ratio	2.9

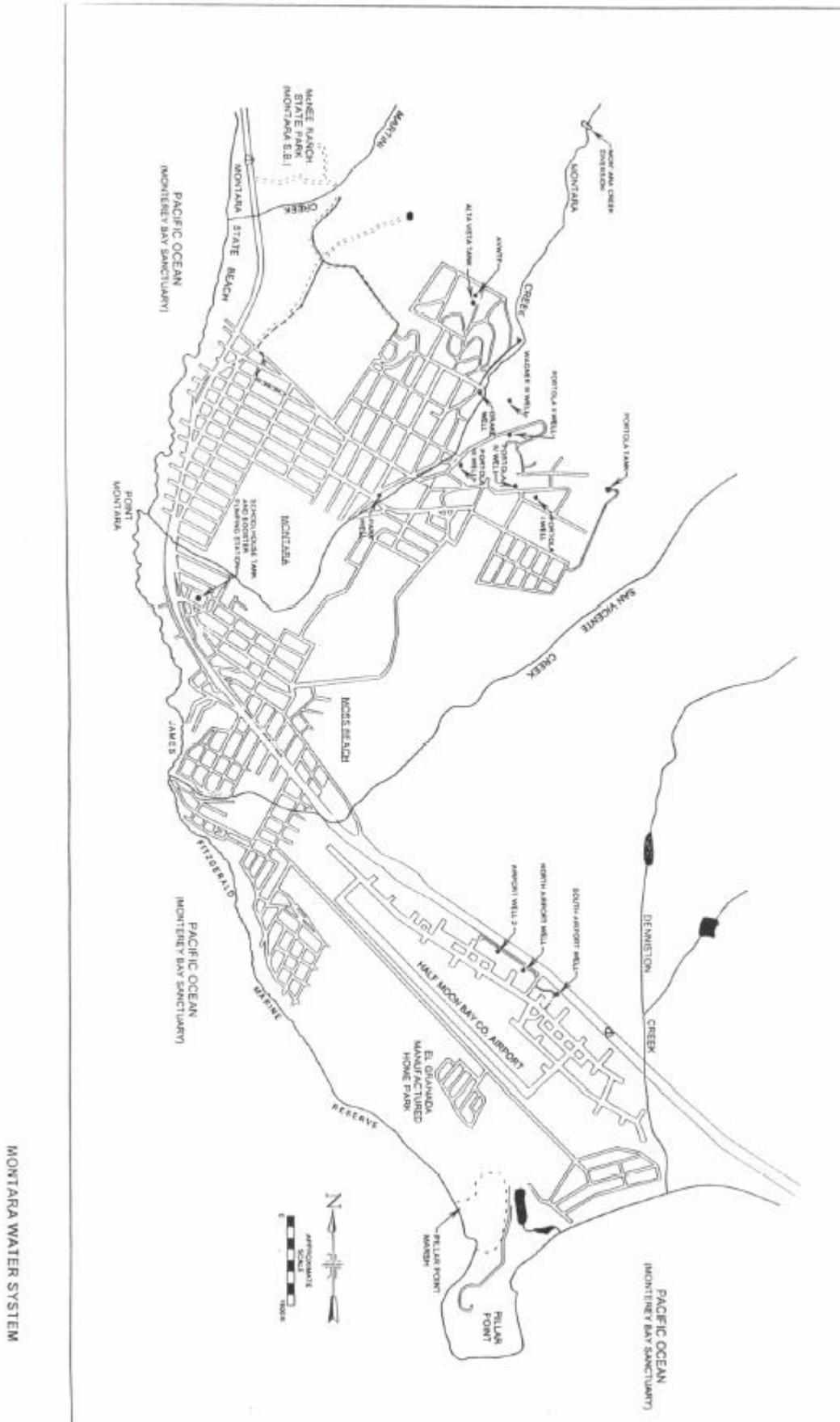
(1) From Tables 4d, row (d): Total Annual Water Supply Benefits

(2) From Table 3, column (c) : Total Annual Costs

Attachments

Attachment 1: Map of Service Area

Attachment 2: Resume of Project Manager



GEORGE F. IRVING**EDUCATION**

Introductory and Intermediate Accounting (12 units), California State University, Fresno
Master's of Public Administration, University of Southern California, Los Angeles
Bachelor of Arts, University of California, Berkeley

WORK EXPERIENCE**District Manager, Montara Sanitary District, 1995 – present.**

As manager of a special district located on the coast between Pacifica and Half Moon Bay, I provide complete administrative support to a Board of Directors elected at large by the citizens of Montara and Moss Beach, CA. My responsibilities include preparing the operating and capital budgets, supervising the capital projects from the time they are advertised for bid to the final payment of the contractor once the job is completed. My accomplishments include developing a maintenance management program to determine the maintenance priorities, level of service and sewer replacement program for each segment of the collection system, developing and maintaining a web site to keep citizens update with the district's activities, develop contracts and bid packages for the hiring of consultants and maintenance contractors, and development of fee structure to pay for the sewer plant expansion and the maintenance of thirteen pump stations, and preparing financial statements each month for Board review.

Deputy Director of Public Works for the City of San Bruno, 2001-2002.

My responsibilities included supervising a workforce of about 50 employees consisting of the Water, Sewer, Storm Drain, Parks, Equipment Maintenance, and Facilities Sections. My accomplishments included obtaining a \$230,000 State Energy grant to develop a SCADA system for the Water Division.

President and Owner, Quantum Electronics Company, 1993 – 1995.

I owned and operated a home-based business as a reseller of computers, computer peripherals, electronic test equipment, fiber optic cable, local and wide area network products and associated electronic equipment.

Manager of Public Works, City of Irvine, 1985 – 1993.

As Manager I have supervised all aspects of public works including facilities, landscape, equipment maintenance, public works engineering, street maintenance and traffic signal maintenance. Supervision of the various sections was rotated so that I supervised all of the various specialties. The City of Irvine has over 600 acres of maintained landscape, over 30 parks, 1200 lane miles of streets and a fleet of over 350 vehicles.

Town Manager, Town of Paradise, California, 1982 – 1985.

Paradise is a full-service community located in Butte County with a population of 25,000. My responsibilities included administering a \$6 million budget with about 90 employees.

Senior Administrative Analyst, County of Fresno, 1980 – 1982.

Fresno County Administrative office was responsible for the budget and administrative control over a diverse organization with about 6,000 employees. I had the responsibility for the county's capital improvement program totaling over \$12 million annually.

Assistant to the City Manager, City of Victorville, California, 1978 - 1980.

I performed a variety of general administrative duties including acting as personnel officer for a city of about one hundred employees, deputy city clerk, director of recreation, and risk manager. I was also responsible for monitoring the contract with the Sheriff's Department for law enforcement services, submitting grant

applications, monitoring the City's Community Development Block grant program, assisting in budget preparation and working with departments to carry out city manager and council directives.

Assistant to the Director of Public Works, City of Oakland, 1972-1978.

As Assistant to the Director I had both line and staff responsibilities in a major city department with over 600 employees. As a line manager I supervised about seventeen employees who worked in an accounting and personnel section, contract administration and compliance, permits and licenses and central files. In my staff capacity I coordinated policies and projects between departments, identified problem areas and assisted department heads in solving them. I was responsible for preparing the annual operating budget of about \$15 million and a capital budget of about \$5 million. The departments in public works included street maintenance, real estate, engineering services, design, and traffic engineering. During my tenure in Oakland I also worked as an Administrative Analyst in the Office of Budget and Management Services, and as a Personnel Analyst in the Personnel Department.

- Administrative Assistant to the City Manager, City of Paramount, California
- Administrative Aide, Office of Research and Budget, City of Burbank, California
- Captain, U.S. Air Force, Chief Administrative Security Branch, 1966 - 1970

HONORARY AND PROFESSIONAL ACTIVITIES

Honor Society of Phi Kappa Phi, University of Southern California.
Member, American Public Works Association.