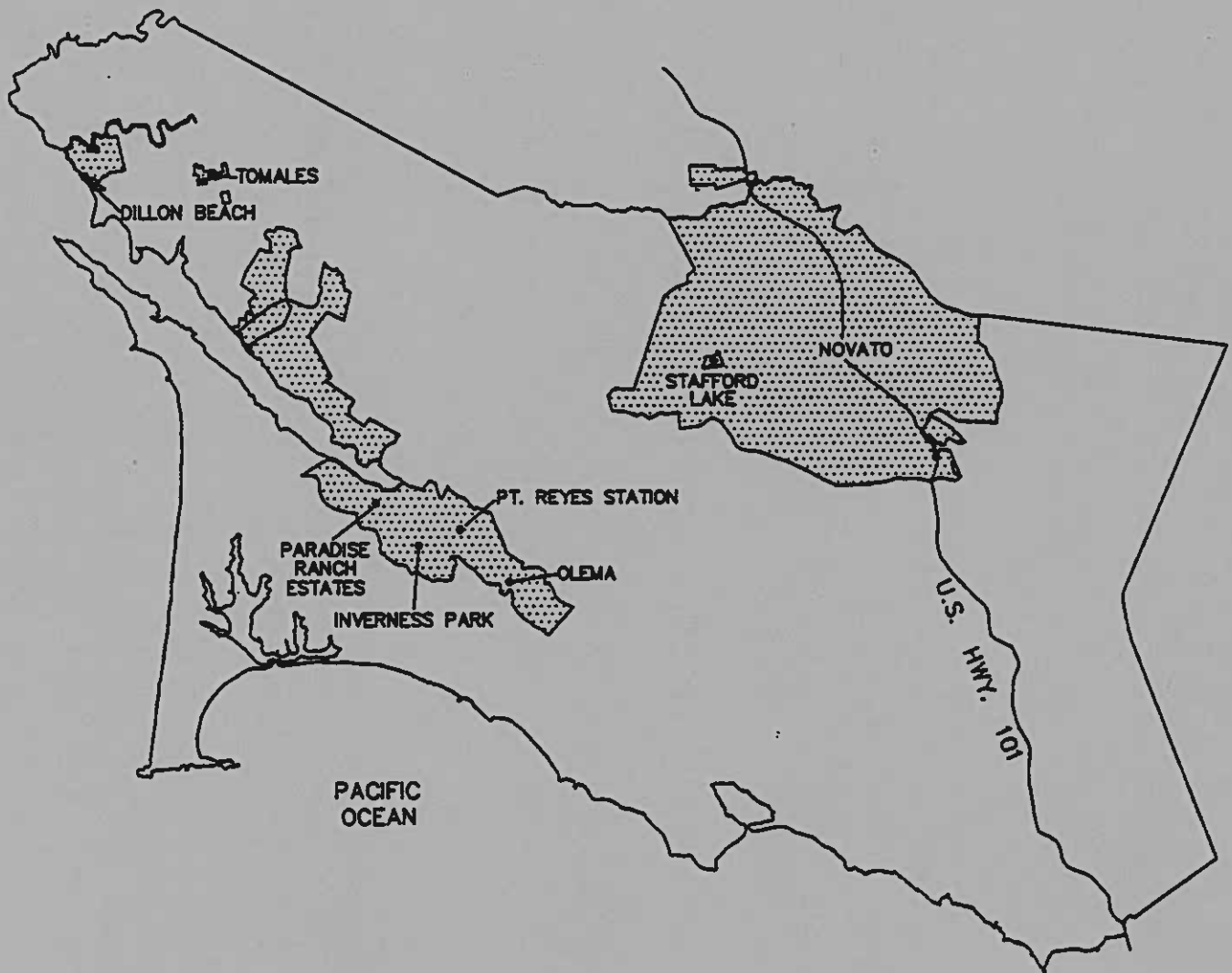


North Marin Water District

Annual Report

Fiscal 1994-95



999 Rush Creek Place, Novato, CA 94945 (415) 897-4133

ANNUAL REPORT

Fiscal Year 1994-95

DIRECTORS

William W. Wright, President

Jack Baker, Vice President

George A. Amaroli

James D. Fritz

John Schoonover

OFFICERS

Chris DeGabriele

General Manager/Chief Engineer

Joyce S. Reed

Secretary

David L. Bentley

Auditor-Controller

Bold, Polisner, Maddow, Nelson & Judson

Legal Counsel

Terry E. Krieg, CPA

Consulting Auditor

CONTENTS

OVERVIEW	Page
◦ District Organization	1
◦ Service Territory	1
◦ Service Functions	1
◦ Water/Sewer Area Characteristics, Rates, and Charges	2
HISTORY	
◦ Public Ownership and Organization	2
◦ Development	2
◦ Water Supply - Stafford Lake	5
- Russian River	6
◦ West Marin Services - Point Reyes/Inverness Park	8
- Olema	9
- Paradise Ranch Estates	9
- Oceana Marin - Sewer Service	10
- Tomales - Sewer Service	11
ACTIVITY IN 1994-95 - NOVATO WATER SYSTEM	
◦ Consumer Activity	12
◦ Water Consumption	12
◦ Water Quality	13
◦ Water Supply - Stafford Treatment Plant	14
◦ Water Conservation - Program Goals and Focus	14
- School Education Program	15
- Low Flow Fixtures Program	15
- Water Conserving Landscapes Incentive Program	15
- Irrigation Scheduling	18
- Narrow Turf Strips Prohibited	18
◦ Capital Improvements/Replacements	18
◦ Financial	19
OTHER ACTIVITIES	20
FUTURE WATER SUPPLY	21

TABLES*

Table 1	- Characteristics of Service Areas	23
Table 2	- Summary of Regular Employees	24
Table 3	- Assessed Valuation and Tax Rate	25
Table 4	- Annual Statistical Summary	26
Table 5	- Source of Annual Water Production	27
Table 6	- Water Production	28
Table 7	- Operating Financial History	29
Table 8	- Water Rate/Charge History	30

FIGURES*

1	North Marin Water District Organization	31
2	North Marin Water District Boundary Map	32
3	Russian River Aqueduct Map	33
4	Schematic Diagram of Water Treatment Process	34
5	Stafford Lake Information	35
6	Typical Russian River Ranney Water Collector	36
7	Water Production	37
8	Water Consumption Per Service	38
9	Pie Charts - Revenue and Expenditure	39
10	Revenue Trends	40
11	Expense Trends	41
12	Assessed Valuation vs. Tax Rate	42
13	Increase in Cost of Water Service to Typical Single Family Residential Unit Compared to Growth in CPI	43
14	NMWD Chronology of Board Members and Officers	44
15	Retirees	45

GLOSSARY	46
-----------------	----

FOLD-OUT MAP SHOWING RUSSIAN RIVER WATER SYSTEM

* Unless labeled or footnoted to the contrary, all tables and figures pertain solely to the Novato Water Service Area (Improvement District NM-2).

OVERVIEW

° DISTRICT ORGANIZATION

The North Marin Water District is a County Water District operating under the provisions of Division 12 of the California Water Code. Its policy board is made up of five Directors elected at large with staggered four-year terms. The Directors appoint three officers of the Board: the General Manager/Chief Engineer, Secretary, and Auditor-Controller. The General Manager is in turn responsible for 42 full-time 10 part-time staff. Total equivalent full-time staff is 48.7. The District is organized into four Divisions: Administration and Finance, Engineering, Operations, and Construction/Maintenance (see Figure 1).

° SERVICE TERRITORY

The District serves a territory of approximately 100 square miles as shown on Figure 2. Six improvement districts have been formed within this territory and provide specific water or sewer service. Each improvement district has its own set of records, and its finances are independent.

Within each improvement district, expansion of utility facilities is based on a "pay as you go" policy whereby the benefitted developer pays for all off-tract and in-tract service facilities. In addition, connection fees are set such that new growth pays the incremental cost to expand the basic utility plant allocable to the new service.

° SERVICE FUNCTIONS

The District currently provides water service in:

- The Greater Novato Area
- Point Reyes Station/Inverness Park Area
- Olema Area
- Paradise Ranch Estates Area

and sewer service in:

- Oceana Marin Area
- Tomaes Area

Latent (unpracticed) service functions are: full service fire protection, (i.e., fire engines, crews and stations), directly operated recreational facilities, garbage collection and disposal service, flood control service, solar sales, wind power generation, and hydro power generation. The

District's Stafford Dam is fitted with a slotted spillway and provides some incidental flood control benefits to the downstream Novato Creek drainage area although no operational facilities are included in the dam. The District also participates in the beneficial generation and revenue sharing of hydroelectric energy at the Warm Springs Dam.

° WATER/SEWER SERVICE AREA CHARACTERISTICS, RATES, AND CHARGES

Since each improvement district stands alone with regard to financing and charges, the cost of service to customers vary by improvement district. These are shown together with service area characteristics in Table 1.

HISTORY

° PUBLIC OWNERSHIP AND ORGANIZATION

The District was formed, following voter approval, in April of 1948, under the State law known as the County Water District Law. The purpose of formation was to purchase the Novato Water Company (then serving approximately 500 consumers), to develop a new source of water supply, and to upgrade and expand the system to meet the needs of a growing Novato community. The District was originally named North Marin County Water District. In 1984 the word "County" was dropped from the name to eliminate any possible confusion as to whether or not the District was a County agency.

Policy of the District is set by five Directors elected at large for four-year staggered terms. Implementation of policy is carried out by the General Manager and his staff, some of whom also serve as officers of the District. Trends in District staffing levels are shown in Table 2.

° DEVELOPMENT

Shortly after forming the District, voters approved two bond issues totaling \$2,000,000 to purchase and upgrade the private water system and to construct Stafford Lake Dam and treatment facilities, designed by Kennedy Engineers. The dam, completed in 1951, was built by contractor T. E. Connolly of San Francisco. The treatment plant, built by C. Norman Peterson, was put into operation the following year.

Growth of the District was rapid during its early years of operation, and in 1954 the spillway at Stafford Lake was raised to increase the initial reservoir capacity of 1,720 acre-feet to 4,450 acre-feet, boosting annual safe yield to 2,000 acre-feet¹. During the following five years, growth exceeded earlier predictions and it became apparent that the District was approaching the limit of its ability to provide water throughout the system. Recommendations based on an 18-month study completed in 1960 resulted in successful negotiations with Sonoma County Flood Control and Water Conservation District (now named Sonoma County Water Agency) and the City of Petaluma for a contract providing for an annual water supply for the District of 10,000 acre-feet of Russian River water and an aqueduct capacity entitlement of 6.5 millions of gallons per day (mgd) to be delivered by an aqueduct from the Russian River to Petaluma. Delivery to Novato required construction of a 9.4 mile, 30-inch cement lined and coal tar coated steel pipeline, the North Marin Aqueduct, which went into service in December of 1961. The contract contemplated construction of the Russian River to Cotati Intertie (an aqueduct from the Russian River to Cotati) by about 1970 when full capacities were expected to be reached in the 24-inch pipe from Cotati to Santa Rosa and when the capacity borrowed in the Santa Rosa Aqueduct (an aqueduct from Santa Rosa to the Russian River) was no longer available because of increasing water needs of the growing City of Santa Rosa (see Figure 3). Financing of the North Marin Aqueduct was achieved in 1960 by voter approval (by a 13-1 margin) of a \$3,790,000 bond issue which also included funds for District expansion and replacement requirements through the year 1970.

The ten year period from 1961 through 1970 saw the number of consumers increase from 4,709 to 9,779, finished water storage capacity (tank storage) increase from two million gallons to 16 million gallons, and annual water production rise from 2,139 acre-feet to 5,605 acre-feet, a 162 percent increase. In this same period, the District completed a number of annexations in southern Sonoma County and Western Marin which increased its area from 75 to approximately 100 square miles (see Figure 2). The District's assessed valuation increased from \$25.7 million to \$80.5 million while the tax rate decreased from 32 cents to 15 cents as shown on Table 3.

¹ One acre-foot, an area of one acre covered with water twelve inches deep, is equal to 325,850 gallons.

By 1970 it became apparent that the contemplated intertie between Cotati and the Russian River was needed. Marin Municipal Water District, also seeking to import Russian River water, was included in the proposed addition. In November of 1971, separate bond elections held simultaneously in the Marin Municipal and North Marin service areas failed, however, to provide the necessary authority for local financing for the Project. The issue failed by a large margin in the Marin Municipal area and by a narrow margin (4 percentage points off the 67% required) in the North Marin area. Marin Municipal was then dropped from the project and North Marin scaled back its share of proposed new capacity to a level calculated to meet Novato area needs through about 1986. In June, 1973, the proposal was again presented to North Marin voters and received 79 percent voter approval. In October, 1974, Sonoma County Water Agency's regular contractors (Cities of Santa Rosa, Petaluma, Sonoma, Rohnert Park, and Cotati and the special districts North Marin, Valley of the Moon and Forestville County Water District) signed a new master agreement (previously each contractor had contracted separately with the Sonoma County Water Agency for service) providing for water supply, repayment of then existing aqueduct debts and construction of the new Russian River to Cotati Intertie project. The contract also provided for a Water Advisory Committee composed of contractors to review Sonoma County Water Agency plans and budgets. Augmentation of supply, however, came too late in relation to growing demands and commencing in May, 1973, the District initiated a controlled water service policy by carefully identifying the remaining uncommitted surplus capacity (water bank) and limiting new connections to available supply. The intertie project was placed in service in April of 1977, at which time the District's aqueduct capacity entitlement was increased by the master agreement to 11.2 mgd. A recap of bond elections sponsored by the District to meet growth is shown in the following table:

Election Date	Bond Amount	Vote	Result	Bond Type	Unpaid Balance ⁽³⁾
April 1949	\$1,500,000	88%	Approved	G.O. ⁽¹⁾	\$0
June 1952	\$500,000	86%	Approved	G.O. ⁽¹⁾	\$0
June 1960	\$3,790,000	92%	Approved	G.O. ⁽¹⁾	\$300,000
November 1971	\$1,600,000	63%	Failed	G.O. ⁽¹⁾⁽²⁾	n/a
June 1973	\$4,100,000	79%	Approved	G.O. ⁽¹⁾	\$3,370,000

(1) General Obligation Bond - Required a two-thirds voter approval.

(2) At this same time Marin Municipal Water District offered a G.O. bond to its voters for a joint project to connect to the Russian River. The issue was very controversial in the Marin Municipal Water District areas. North Marin Water District was in same "newsshed" (Independent Journal).

(3) As of June 30, 1995.

In 1974 Stafford treatment plant was modified to increase water production from 3.75 mgd to 6.3 mgd. The expansion project was designed by consulting engineer Russell L. Culp and built by contractor C. R. Fedrick.

In the early 1980's the original Stafford Dam toe drain pipe was found to be in a deteriorated and corroded condition. Furthermore, the state of the art for designing the earth filter surrounding the drain had advanced significantly. In 1984 the toe drain was reconstructed and the toe drain pipe replaced. Harlan Miller Tait was the consulting design engineer and C.R. Fedrick was the construction contractor for this work.

In 1985 the dam embankment and crest was raised eight feet to its current height of 80 feet and the spillway was reconstructed. This project was undertaken with the Marin County Flood Control District to improve flood control on Novato Creek by providing an additional three feet of flood surcharge storage in the reservoir to reduce flows downstream during a flood event. The spillway modification and reconstruction was designed to accommodate the probable maximum flood. The probable maximum flood is that which results from a precipitation event with virtually no risk of exceedence. The project was designed by Harlan Miller Tait and DYN Construction Corp. was the general contractor.

° WATER SUPPLY

Stafford Lake lies four miles west of downtown Novato and collects the runoff from 8.3 square miles of watershed land adjacent to the upper reaches of Novato Creek. Water from Stafford Lake is drawn by the intake tower and fed by gravity or by pumping (depending on the lake level) into the 6.3 mgd treatment plant located just below the dam. Aluminum

sulfate and chlorine are added to the raw lake water as it enters the coagulation and sedimentation basin where most impurities are settled out and bacteria are inactivated. Polymers are added to improve coagulation and to aid filtration. Multi-media filters consisting of granular anthracite, garnet sand and gravel, filter and discharge the water into a clearwell where sulfur dioxide is injected to reduce chlorine residuals to an acceptable level of 0.5 parts per million (ppm). As this water enters the transmission system, sodium hydroxide is added to protect against corrosion by adjusting the pH (degree of acidity) of the water. At this point, the treatment process is complete and the water is on its way to the consumer. Periodically, carbon is applied just ahead of the filters to control taste and odor occasioned by periodic algae growth in the lake. The treatment process is shown in Figure 4. Information about the Lake and Dam is shown in Figure 5.

Russian River water originates in Mendocino County and derives from both the Eel River (via Pacific Gas and Electric's Van Arsdale diversion at Cape Horn dam feeding water through a 1.6 mile tunnel to the Potter Valley Powerhouse on the east fork of the Russian River) and the Russian River watershed northeast of the City of Ukiah. Just downstream of the powerhouse, the Eel River diversions and winter runoff from the local watershed are impounded by Coyote Dam in Lake Mendocino, which is owned and operated by the U.S. Corps of Engineers, and releases are made during summer months (see fold-out map on last page of this report). The channel of the Russian River carries released water downstream. At a point about 10 miles upstream of Guerneville, water is collected at the Wohler Pumping Plant by five Ranney Water Collectors (Figure 6). These deep wells collect river water which has infiltrated through 60 to 90 feet of natural sand and gravel to perforated pipes located at the bottom of each well. The thick layer of sand and gravel through which the water must pass before reaching the intake pipes provides a highly efficient natural filtration process which, with the chlorination treatment accomplished in the wells, produces a clear, potable, bacteria-free water. This water is then fed directly into the aqueduct system. The fold-out schematic diagram contained at the end of this report shows the entire system to approximate scale.

Both Stafford Lake and Russian River supplies are essentially free of iron and manganese and characteristically exhibit moderate hardness levels (approximately 6 grains of hardness per gallon) and therefore use of home water softeners in the region is rare.

Prior to construction of Warm Springs Dam, during extremely dry years the amount of water in the Russian River was unable to meet the various demands imposed on it. These include water for agriculture, towns along the River, the Sonoma County Water Agency diversions in the Wohler area, and instream flows required for fish and recreation. Based on 1975 demands and 55 years of hydrologic data, studies by the State Department of Water Resources indicate that 4 out of 55 years would suffer a deficiency ranging up to a maximum of 65,700 acre-feet per year. By year 2000, taking into account a growth rate consistent with regional plans, increased groundwater use and assuming urban water conservation, state studies projected a deficiency ranging up to a maximum of 131,200 acre-feet in 12 out of 55 years. Recognizing this problem, Sonoma County voters supported construction of Warm Springs Dam. Formally proposed for the first time in 1948, the dam was to face many setbacks. In the early years federal funds were simply not available. In 1959, Congress finally appropriated funds. However, additional studies and delays occurred, and it was not until 1967 that initial construction got underway. By May of 1974, the project was well under construction but ground to a complete halt due to an injunction resulting from a claim by project opponents that the Corps of Engineers had failed to follow the provisions of the National Environmental Policy Act. The major construction contract was aborted and not again advertised and awarded until March of 1978 after the issue had worked it's way through the federal courts culminating in refusal by the Supreme Court to review an appellate court ruling permitting construction of the dam. In 1979 the voters of Sonoma County turned out in large numbers and 72 percent declared that the Sonoma County Water Agency should not cancel its contract with the federal government for repayment of the local cost share of the project thus in effect, ratifying the original approval of the project. The U.S. Corps of Engineers finished major construction work on the dam in 1983, only some road work, perimeter fencing of lands and recreation facility construction remained. Recreation facilities continue to be added since that time and boating on Lake Sonoma is proving to be popular. This multipurpose project provides the multiple benefits of flood control, recreational usage, fish propagation, and a water supply pool capable of furnishing a safe annual yield of 225,000 acre-feet. Yield from the project for water supply is expected to eliminate projected deficiencies in the Russian River source of supply through at least the year 2000. The District has actively supported the Warm Springs project and on April 6, 1982, the master water supply agreement was amended to include repayment of the District's share of the dam.

° WEST MARIN SERVICES

Point Reyes/Inverness Park Area The Point Reyes Station Water Company was established in the early 1920's by the Burdell family and was transferred to the ownership of Waldo Giacomini in 1944. In 1946 the system was sold to H. S. Porter who, in turn, sold to James J. Downey in 1947. Downey had also purchased the Inverness Park Water Company in 1944. Under private operation the two water systems experienced a history of water outages, low pressure and boil-water orders from the Marin County Health Department. Primary causes of inadequate service were flooding of intake wells on Lagunitas Creek, inadequate finished water storage, pump failures, main leaks, breakdown of surface supply sources (mainly springs) in Inverness Park, and contamination of supplies.

Local residents finally turned to a public agency for help which led to annexation of the area encompassing Point Reyes Station, Olema, Bear Valley, Inverness Park and Inverness to North Marin Water District in March, 1967. Formation of an Improvement District (PR-2) to investigate water supply to the entire area was turned down by the voters in November, 1967, by a 56% "no" vote. Subsequently, a more limited Improvement District encompassing Inverness Park, Point Reyes Station and a part of Bear Valley was approved in 1970 and the District was authorized to study the acquisition and upgrading of the two private water companies serving these areas.

In November of 1970, by a 70% "yes" vote, voters approved the formation of an Improvement District for the purpose of acquiring and improving the Inverness Park and Point Reyes Water Companies. A maximum bond indebtedness of \$250,000 was also approved. Bonds in this amount were purchased by the U.S. Department of Agriculture, Farmers Home Administration on a 5%, 40-year payback basis. Upgrading of the system commenced immediately and included replacement of a major portion of the distribution facilities, installation of a treatment plant, addition of a 100,000 gallon storage tank in Point Reyes Station and connection of the Inverness Park System to the Point Reyes Station water source (Lagunitas Creek). Financing of the acquisition and rehabilitation costs was assisted by participation from the U.S. Coast Guard Point Reyes Housing Facility.

In 1981, work commenced on rehabilitating the remaining remnants of the system needing attention. In Point Reyes Station and Inverness Park, 18,865 feet of pipeline was either replaced or installed, a 300,000 gallon tank was added in Point Reyes Station and a 100,000 gallon tank was added in Inverness Park. Total cost of these improvements was

\$820,015. A 72% grant and loan for the balance (40-year, 5%) was acquired from the U.S. Department of Agriculture, Farmers Home Administration to finance this project. At the close of the 1994-95 fiscal year, 506 customers were served from the Point Reyes/Inverness Park system.

Olema In June, 1973, after petition and creation of an Improvement District (OL-1) for the investigation of water service to Olema and the Point Reyes National Seashore Headquarters, voters in Olema by a 92% "yes" vote approved formation of an Improvement District (OL-2) to acquire and improve the Olema Water Company owned by W. Robert Phillips and others and to service that area. A bond debt of \$70,000 was also approved. The Farmers Home Administration purchased the bonds. In June of 1974, the District took over operation of the Olema Water Company. On June 6, 1973, just prior to the election, an agreement providing for payment of actual costs was also entered into with the National Park Service's Point Reyes National Seashore, for service to the Seashore Headquarters. The agreement was contingent on the election outcome. Service to Olema and the Seashore was provided by interconnecting to the Point Reyes System via a 4-inch pipeline constructed along State Highway 1 and "buying into" the basic production, treatment and storage works of the Point Reyes/Inverness Park System. In 1991, at the demand of the Farmers Home Administration, the Novato Water District repurchased the remaining \$56,760 balance in the Olema bond debt. At the close of the 1994-95 fiscal year, 43 customers, including the Point Reyes National Seashore headquarters, were served from the Olema system.

Paradise Ranch Estates This private water system with 85 customers had been created by David S. Adams and Sons in 1952 to provide water for homes constructed in the Paradise Ranch Estates Subdivision located to the north of Inverness Park. For the first 20 years the developer gradually expanded the system relying mainly on springs as a source of supply. Problems with water quality and quantity progressively developed and worsened until finally in 1969, the Marin County Health Officer issued a boil-water order to all customers of the company. Subsequently in 1972, the County declared a moratorium on issuance of further building permits. A suit by homeowners and owners of undeveloped lots resulted in an agreement reached in Marin Superior Court in late 1978 providing for the existing water system owners to finance a feasibility study by the District addressing takeover, operation and improvement of the system. This culminated in formation of Improvement District No. PRE-1 and a successful election authorizing a \$240,000, 5% 40-year, debt secured by revenue

bonds which, in conjunction with a \$720,000 Farmers Home Administration grant, financed system rehabilitation. Service was provided from the Point Reyes System by installation of an additional well, expansion of the treatment plant, and a 6-inch pipeline connection at the Inverness Park pump station extending about 1.6 miles along Sir Francis Drake Boulevard to the newly reconstructed Paradise Ranch Estates distribution system. At the close of the 1994-95 fiscal year, 148 customers were served from the Paradise Ranch system.

Oceana Marin - Sewer Service In response to requests by the County of Marin, the District entered into service agreements with the developer of Oceana Marin, a 251-lot subdivision adjacent to Dillon Beach. 1913 Act Assessment Bonds of the County of Marin provided financing for portions of the project. Service commenced in June of 1973 to 12 dwellings. By the end of the 1994-95 fiscal year, a total of 184 dwellings were being served.

The collection system consists of 6 and 8-inch AC and PVC pipe. All wastes flow by gravity to a pretreatment and pump station located near the edge of a bluff overlooking the mouth of Tomales Bay. The station is a buried concrete box about 20 feet long by 10 feet wide by 10 feet deep. The sewage flows into a grit and grease separator, then through a grinder into a holding basin. It is pumped from the holding basin to the treatment and storage ponds located at the top of the headlands just east of Oceana Marin. There the wastes are held and treated by aerobic decomposition. Prior to 1990, the natural aerobic decomposition occurred. As pond loading increased, it was necessary to boost introduction of air by using floating aerators which were installed in 1990.

In the Fall of 1981, an irrigation disposal system was installed and irrigation disposal of treated effluent from the ponds was initiated. Irrigation was accomplished by a system of subsurface perforated pipes laid in gravel ditches aligned along contour lines and was undertaken only when the field was dry and all effluent could be absorbed into the soil within the irrigation field.

In February, 1982, the District was awarded a grant from the EPA and State Department of Water Resources for funding a study of ways to enlarge the existing facility or relocate same to the sand dune area near Dillon Beach. Completion of the study was delayed until late 1986 due to lack of federal/state funds. Additional studies on the viability of the dune disposal option were accomplished in 1988 in an engineering study conducted by Questa Engineers under contract to the County of Marin in connection with an Environmental Impact Report being prepared for a development proposal for Parcel K, a parcel which is

surrounded by District served lands in Oceana Marin. So far, development of Parcel K has not progressed and remaining work on the dune disposal option has been delayed.

During the 1988-89 fiscal year the wastewater disposal system exhibited some surface seepage. A study was commissioned to determine the nature and extent of improvements necessary to accommodate anticipated growth in the Oceana Marin area and correct the seepage problem. In 1990, a new pressurized sub-surface irrigation system was installed that maximized the disposal capacity and reliability of the irrigation field. Also installed in late 1990 was a computerized control unit that monitors and operates equipment and transmits failure alarms from the Oceana Marin lift station to the District's control center in Novato. In 1992, an accurate flow meter that sends sewage flow data via the computerized control unit was installed at the lift station. In 1992, and 1993, substantial improvements were made in the treatment pond piping and aerators were installed in the treatment pond to improve disposal water quality. In FY 1993-94 the District began design of a dosing system to enhance operation of the pressurized sub-surface irrigation system. The dosing system was constructed in FY 1994-95 as a component of the Oceana Marin Build Out Master Plan required by the California Regional Water Quality Control Board.

Tomales - Sewer Service In late 1973, responding to a request by the County of Marin, the District entered into a contract with the County to study the feasibility of building a sewer system to serve the community of Tomales. At that time there existed a Sewer Maintenance District under the auspices of the County which covered a portion of the town. This "paper" District was under much pressure by the California Regional Water Quality Control Board to eliminate the illegal raw discharge emanating from a "privately" constructed sewer system which served the downtown area. After a community survey and several hearings, the District completed the study in December, 1974. Residents petitioned that the proposed project be placed on the ballot. In June of 1975, 89.4% of the voters approved formation of the Tomales Sewer Improvement District, authorized a tax of up to 75¢ per \$100 assessed valuation and authorized the District to borrow \$189,200 from the State Water Resources Control Board Loan Fund to cover the local share of a Clean Water Grant project. The tax rate actually levied in the 1994-95 fiscal year was 2.8¢ per \$100 of assessed valuation. The project was designed in late 1975 and early 1976 and was put out to bid in July, 1976. On August 9, 1976, construction was awarded to Rubicon Construction Company to build the project. The project was completed in April of 1979. Total project cost

was \$1,170,935 with grants from the Clean Water Grant program and Marin County grants making up 83% of the total. The bulk of the grants came from Environmental Protection Agency (EPA) and the State Clean Water Grant program. In mid-1981, an EPA audit of the project disallowed \$180,546 in project costs expended, and the District filed a notice of appeal with the EPA and proceeded with the administrative processes required to lead to a formal hearing. The hearing in November, 1982 was followed by a negotiated settlement agreement. The \$180,546 disallowed costs were reduced to \$38,123 and final payment was received in FY 1983-84. At the close of the 1994-95 fiscal year, 88 active connections were being served by the Tomales sewer system.

ACTIVITY IN 1994-95 - NOVATO WATER SYSTEM

° CONSUMER ACTIVITY

Total metered services installed increased by 0.5% or 93 services in the Novato area compared to an increase of 144 services in the preceding year. Active services increased by 0.7% or 128 services compared to an increase of 94 a year earlier (see Table 4).

The residential dwelling unit mix experienced in new service applications during the year compared with earlier years was as follows:

	<u>1994-95</u>		<u>1993-94</u>		<u>1992-93</u>		<u>1991-92</u>		<u>1990-91</u>		<u>5-Yr Avg.</u>		<u>Cumulative to Date⁽¹⁾</u>
SF	38	50%	24	25%	23	53%	61	34%	146	73%	58	49%	13,861 66%
THC	38	50%	0	0%	2	5%	17	9%	0	0%	11	9%	3,022 15%
Apt	0	0	0	0%	18	42%	101	56%	54	27%	35	30%	3,396 16%
MH	<u>0</u>	<u>0%</u>	<u>71</u>	<u>75%</u>	<u>0</u>	<u>0%</u>	<u>0</u>	<u>0%</u>	<u>1</u>	<u>0%</u>	<u>14</u>	<u>12%</u>	<u>660</u> <u>3%</u>
	76	100%	95	100%	43	100%	179	100%	201	100%	118	100%	20,939 100%

SF - Single family detached unit

THC - Attached single family unit, such as a townhouse, condominium, or duplex unit

Apt - Apartment unit

MH - Mobile Home

(1) Sum of all dwelling units served by Novato water system as of June 30, 1995.

New service applications reflect a contractual commitment to serve water and in many cases the services are not actually connected and served until a subsequent year; hence, direct comparison of the tabular data provided above to total metered or active service statistics stated in the first paragraph of this section would be inaccurate.

◦ WATER CONSUMPTION

Russian River water (8,714 acre-feet) accounted for approximately 89% of the total supply this year, up from 80% the prior year. The remaining 11%, or 1,065 acre-feet, was drawn from Stafford Lake, as shown in Table 5, and Figure 7.

There were no deliveries of water to Marin Municipal Water District (MMWD) during the fiscal year. An existing agreement between MMWD and Sonoma County Water Agency makes available 15,000 acre-feet of water per year. This water is wheeled through the North Marin water system for MMWD's benefit. MMWD pays North Marin Water District a wheeling charge of \$10 per acre foot of water and reimbursed North Marin for the cost of surplus entitlement water. During the year 4,784 acre-feet of water was wheeled to MMWD.

Peak day (June 25, 1995) demand was 16.09 million gallons, down from 16.75 million gallons experienced on August 1 of the previous fiscal year. Average day of the peak month, August 1994, was 13.59 mgd, up from 13.18 experienced in July of the prior fiscal year. Average day demand was 8.73 mg, unchanged from 8.73 mg in FY 1994. Average day of the peak month (August) demand per connection was 780 gallons, up from 762 gallons in fiscal year 1994. Unaccounted-for-water was 301 mg or 9.4% of production. Historic values are shown in Table 6. The various demand parameters in terms of gallons per active connection are tracked and shown on Figure 8.

◦ WATER QUALITY

The Novato system receives its potable water from two sources - Stafford treatment plant located four miles west of town which treats water from Stafford Lake and the North Marin Aqueduct which carries water purchased from Sonoma County Water Agency. North Marin Aqueduct water originates in the sand and gravel aquifer 60 feet below the Russian River.

Monitoring is performed as required by State and Federal Regulations. With the exception of the Aqueduct water's tendency to erode metallic plumbing, the Novato supply is of excellent quality. The Sonoma County Water Agency has designed an additional treatment step that will raise the pH of the water so that high copper levels will no longer be a problem. The additional treatment step is required to be on-line by 1997. The agency anticipates an earlier installation date.

Maintenance of the distribution system plays a big role in assuring the quality of water delivered to customers. Tank inspections, flushing of pipelines, and an aggressive backflow prevention device inspection program are all part of annual maintenance.

New increased coliform monitoring requirements have been promulgated by public health authorities in recent years. The standards are much stricter than in the past. The zones served by the Wild Horse Tank system has been identified as being a potential candidate for additional chlorination. A study conducted 1994-95 determined a chlorine booster station at Trumbull Pump Station is appropriate. The design and installation of this new facility will occur in 1996.

A watershed survey was initiated in June which will fulfill regulatory requirements of the California Department of Health Services (DHS). The purpose of the survey is to identify all potential pollutant sources on the Stafford Lake watershed. Of particular concern will be the potential of agricultural runoffs that could contain cryptosporidium. Cryptosporidium was identified as the cause of parasitic, intestinal disease outbreaks in the cities of Milwaukee and Las Vegas. Potential sources include failing septic systems and young calves. The DHS is coordinating a data gathering effort in the Bay Area that will be used to help develop treatment guidelines for water supplies and prevention education for immunosuppressed individuals who are impacted by the disease. The Stafford treatment process is undergoing special water quality studies to determine the filtration capacity of the plant. The studies will be completed in the fall of 1995. They will focus on the removal of particles in the size range of cryptosporidium cysts. Testing of Stafford Lake water has found no cryptosporidium.

° WATER SUPPLY

Stafford Treatment Plant capacity of 6.3 mgd was not approached at any time during the year, and the plant routinely operated at a output rate of 1.9 to 4.2 mgd. Extreme rainfall in the winter of 1994-95 (the fourth highest rainfall of record) produced sufficient runoff to fill Stafford Lake by January 10, 1995. Surplus storage enables normal Stafford production in 1995.

° WATER CONSERVATION

Program Goals and Focus The District's water conservation goal is achievement of a permanent 15% reduction in water demand during the average day of the peak month by the year 2015 compared to the average level of demand for the 8 year period ending July 1976.

With turf irrigation, showers and toilet flushing/leaks making up 70% of the District's residential demand which in turn accounts for 85% of all demand, these water use activities are identified as the principal targets for the District's water conservation program. The District continued to pursue development of strategies that could achieve identifiable water conservation results and to support ongoing education through the District's School Education program, Xeriscape promotion program (Cash

for Grass) and other information and literature designed to increase penetration of various water conservation strategies.

School Education Program The Novato Unified School District was supplied with school educational materials throughout the 1994-95 school year. The district's goal to reach two out of every seven elementary school students with water conservation material each year has been expanded to include middle school students also (K-8). Approximately 300 students (a total of 10 classrooms) were presented with materials. Approximately two hundred Water Supply Systems maps with order forms for the teacher to request materials and presentations were distributed. The schools which participated in the program were Loma Verde, Hamilton, Rancho and San Jose Middle School. Three classroom instructional presentations were requested by first grade teachers at Rancho School in 1994-95. Three hours of classroom instruction were provided by Sonoma County Water Agency water information specialist Ellen McHugh to each of these first grade classes.

The Sonoma Agency's education program goal is personalized contact with teachers through an annual presentation at staff meetings. This individual contact will allow us to secure necessary teacher commitment to the District's school education program and results in more materials being disseminated and classroom teaching scheduled.

Low Flow Fixtures Program The low flow fixture effort was continued during the year and developers were required by State law, building codes, and District regulations to install ultra-low flush (ULV) toilets, lavatory, shower and kitchen faucet flow control devices. ULV's use 1.6 gallons per flush and were required in all new construction and remodel work starting January 1, 1992, pursuant to statewide legislation drafted by the District and sponsored by the California Municipal Utilities Association. In the Point Reyes Station service area, the District continued its stringent water conservation program which virtually eliminates planting turf grass in new landscapes and requires installation of ultra low flow (1.6 gallon per flush) toilets in new residences. The District went a step further and in March, 1992, required retrofit of water conservation fixtures (including 1.6 gallon per flush toilets) whenever a home is sold. The District also continued to pay a \$40 rebate per toilet to Point Reyes area customers to encourage voluntary early retirement of old toilets. Fifteen old toilets were replaced under the rebate program last year, and 47 have been replaced to date.

Water Conserving Landscape Incentive Program Outside water use comprises 40% of all District water use, therefore reductions in the amount of water used to irrigate landscaping means significant savings. Studies conducted by the District in the mid-1980s at a series of residential condominium sites comparing landscapes installed using xeriscape concepts vs. traditional landscapes

dominated by turf showed substantial savings. The water-conserving landscapes required 49% less water, 32% less labor, 52% less fertilizer, 44% less fuel (measured in gasoline for lawn mowing and trips to haul cuttings to the dump) and 22% less herbicide. In 1986 the District introduced economic incentives to encourage developers to reduce the percentage of landscape devoted to turf grass. The District again continued the incentive program to encourage installation of Xeriscapes in new residential development. The District's Water Conservation rules (Regulation No. 15) provide that if owners or developers agree to landscape new properties pursuant to the criteria set forth in Regulation 15, that they will earn a discount on their connection fee (Facility Reserve Charge). The District's facilities reserve charge for a single family detached home served by a 5/8" x 3/4" meter was \$2,940 throughout the fiscal year. The landscape criteria relating to turf grass limitations and discounts offered were:

<u>Type of d.u.</u>	<u>Maximum Turf Area</u>	<u>Discount</u>
SF (single family detached)	800 square feet	\$200
THC (townhouse or condominium)	400 " "	\$150
APT (apartment)	130 " "	\$100
SC (senior citizen unit)	95 " "	\$80

In 1989 the District began offering a rebate to homeowners landscaping their lots for the first time who agreed to limit the amount of turf installed according to the criteria. On March 17, 1992, the District extended the rebate to existing homeowners who volunteer to remove existing irrigated grass and replace same with xerophytic plants. The rebate was set at \$35/100 square feet of grass removed with the maximum rebate that could be earned set equal to the amounts shown in the table above depending on the type of dwelling. This new program, called "Cash for Grass" came about as a result of extensive research conducted by the District and presented in the "Report on Results of One Year Pilot Project - Cash for Grass," dated January 1991.

In the summer of 1993, the District conducted research on 382 single family homes. Half had xeriscapes. A multivariate regression analysis showed that the homes with xeriscapes, on average, used 17% less water and that the reduction was highly correlated with the amount of irrigated lawns present.

During the fiscal year ending June 30, 1995, the response to the incentive offer to developers installing new landscapes was dismal based on the lack of any real development activity as shown in the following table:

<u>Residential Class</u>	<u>Number of Projects</u>	<u>Projects That Met Standard</u>	<u>Dwelling Units (d.u.)</u>		
			<u>Total</u>	<u>That Met Standard</u>	<u>% Meeting Standard</u>
SF (single family detached)	4	0	35	0	0%
Duplex	0	0	0	0	0%
THC (townhouse/condominium)	1	1	38	38	100%
APT (apartments)	0	0	0	0	0%
MH (mobile home)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0%</u>
	5	1	73	38	52% wt'd avg.

In addition, three individual SF units obtained new service, however none earned a cash rebate for installing a new landscape that met the District's turf limitation criteria.

Cash rebates were also offered to homeowners removing grass during the period. In all, two homeowners with existing landscapes earned rebates for removing turf and substituting water conserving plant materials.

During the period the incentive program has been in place (July 1, 1986 through June 30, 1995), the cumulative response through fiscal year 1995 has been:

	<u>FY86</u>	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY 95</u>	<u>Cum. Total</u>
Credit/Rebate for New Landscapes Program:											
All New Landscapes:											
SF	40	158	119	83	52	145	61	23	24	38	743
THC	219	149	153	214	20	0	17	2	0	38	812
APT	<u>0</u>	<u>225</u>	<u>0</u>	<u>11</u>	<u>0</u>	<u>56</u>	<u>101</u>	<u>18</u>	<u>0</u>	<u>0</u>	<u>411</u>
Total	<u>259</u>	<u>532</u>	<u>272</u>	<u>308</u>	<u>72</u>	<u>201</u>	<u>179</u>	<u>43</u>	<u>24</u>	<u>76</u>	<u>1,966</u>
Participating New Landscapes:											
SF	0	0	0	0	7	11	7	1	1	0	27
THC	48	110	153	64	20	0	17	2	0	38	452
APT	<u>0</u>	<u>225</u>	<u>0</u>	<u>11</u>	<u>0</u>	<u>50</u>	<u>101</u>	<u>18</u>	<u>0</u>	<u>0</u>	<u>405</u>
Total	<u>48</u>	<u>335</u>	<u>153</u>	<u>75</u>	<u>27</u>	<u>61</u>	<u>125</u>	<u>21</u>	<u>1</u>	<u>38</u>	<u>884</u>
% Participating	<u>19%</u>	<u>63%</u>	<u>70%</u>	<u>24%</u>	<u>39%</u>	<u>30%</u>	<u>70%</u>	<u>49%</u>	<u>4%</u>	<u>50%</u>	<u>45%</u>

Cash for Grass Rebates for Existing Landscape Modifications:**Existing Landscapes Participating**

SF	n/a	n/a	n/a	<u>2</u> ¹	<u>34</u> ²	<u>18</u> ³	<u>1</u> ^{3,4}	<u>3</u>	<u>2</u>	<u>2</u>	<u>62</u> ⁵
----	-----	-----	-----	-----------------------	------------------------	------------------------	-------------------------	----------	----------	----------	------------------------

Footnotes¹ Pilot program commenced on May 1, 1989.² May 1, 1990 was the deadline for receiving applications for the pilot program.³ Although program not offered this period, prior applications which were perfected were honored.⁴ Program made permanent on March 17, 1992 but not promoted in FY 92.⁵ There were 13,861 total existing SF landscapes on June 30, 1995 in the Novato service area.

Irrigation Scheduling Efficient scheduling information for irrigation of turf using the California Irrigation Management Information System (CIMIS) continued in the fiscal year. From evapotranspiration data provided by CIMIS, District staff calculates an irrigation advisory to be used by persons scheduling irrigation on large turf parcels. The District's Turf Irrigation Information Service is reached by calling 892-1418 extension 555. This program was initiated in 1986 from a \$20,000 grant from the State of California Office of Water Conservation and has been continued to date.

Narrow Turf Strips Prohibited In conducting research on irrigation efficiency at commercial sites, the District had determined that narrow strips of turf require 300% to 500% more water than large, more efficiently, irrigated turf grass areas. Regulation 15(f) prohibits use of turf in new landscapes in narrow configurations. The regulation provides for minor exceptions to maintain diversity and deal with small landscapes and sites not requiring an approvable landscape plan as a condition of building permit award. The regulation, therefore, does not apply to most single family home development. Enforcement of this regulation continued during the period.

° **CAPITAL IMPROVEMENTS/REPLACEMENTS**

Forty-four budgeted improvement projects totaling \$897,780 were completed during the fiscal year. These included several pipeline replacement projects, replacement of several buried fire services, upgrading of the operations central computer, relocation of the Half Moon tank pipeline, relocation of mains coordinating with the City and County, purchase of the MMWD 24" Highway 101 crossing, improvements to the Stafford treatment plant recovery pond, relocation of the radio transmitter site, and completion of the master plan and network analysis program. Utility plant, mainly pipeline, added by 26 developer financed projects totaled \$1,593,415 for the year. Completed during the period was the Vintage Oaks In-tract, Redwood Landfill, Olive Plaza, Windmere Subdivision, Scottsdale Lake Condos Fire Service,

Hillside Park Unit 4, Verissimo Drive Land Division, Deer Garden Land Division, Lucky Store Expansion, Moylan's Brewery, Fireman's Fund Improvements, and Hamilton Air Force Base Homeless Housing.

° FINANCIAL

A recap of FY 1994-95 revenue and expenditures is presented graphically in Figure 9. Water sales revenue of \$4,710,298 was 2.1% under budget and 0.4% under last year's revenue. Total operating revenue was \$4,807,617. Operating expense before depreciation was 6.9% over last year's expense. A historical comparison of revenue and expense is shown in Table 7. See also Figures 10 and 11 for a graphic display of the annual source of revenues and expenses. Interest earned on invested funds totaled \$561,790 and was up \$42,937 from the previous year. Bond servicing totaled \$564,123 for the year representing principal and interest on one 1961, two 1974 and one 1986 general obligation bond issues. Bond principal outstanding in the amount of \$310,000 was retired during the year.

To service the bond payments as they become due, the District contracts with the County for tax collection. The Novato 1994-95 tax rate was set at 1.1¢/\$100 AV, down from 1.2¢ the preceding year. Historic District taxation is shown in Table 3 and Figure 12. The Board reviewed and ratified a 3¢/Ccf increase in the uniform water commodity rate effective September 1, 1994.

Table 8 shows a history of changes in the District's minimum charge and commodity rate. Figure 13 shows the overall cost of billed water service for a typical SF customer to be \$213.00 based on typical consumption of 165 Ccf per year. If average bond tax assessment is included, the cost totals \$232.44 per year for a typical single family detached dwelling. Also shown is the history of charges and CPI (San Francisco Bay Area Consumer Price Index) going back for thirty-seven years. This comparison shows that the current cost of service, in terms of real dollars, is 41% less costly than it was in 1958.

OTHER ACTIVITIES

- ° The Board approved an increase in the water commodity rate for Paradise Ranch Estates customers of 25¢/Ccf to \$2.00/Ccf effective August 1, 1994. Also effective August 1, 1994, the Board authorized an increase in the monthly sewer service charge of \$2.00 per month for Tomales customers and \$1.00 per month for Oceana Marin customers. Their monthly charge increased to \$37.00 and \$29.00 respectively.
- ° The Board approved an across-the-board wage increase for all employees of 0.6% effective July 1, 1994. The Board also approved adoption of the PERS "2% at Age 55 Retirement Plan" subject to the provision that employees would forego a portion of any annual cost-of-living increase awards in both the current and future years to offset the full incremental cost of the enhanced retirement plan.
- ° Staff conducted a comprehensive survey of salaries and benefits paid by eleven comparable public agencies. Using twelve District positions as benchmarks, the findings showed that salary adjustments to individual positions were indicated ranging from a reduction of 1.8% to an increase of 8.1%. the weighted average increase for the District as a whole was 2.28%. The survey calculation included maintenance of the 5% productivity award granted all employees and additional increases for female dominated positions. The changes were approved effective July 1, 1994.
- ° In July the Board considered a reorganization plan presented by the General Manager wherein District staffing would be reduced from 50.4 full-time-equivalent (fte) employees to 45 fte employees. At the end of the fiscal year total District staffing stood at 48.7 fte employees. Staffing changes similar to those recommended are gradually taking place.
- ° Effective September 1, 1994 a 3¢/Ccf commodity rate increase for Novato area customers was approved. The increase raised the weighted average commodity rate to \$1.00/Ccf. The Board later rejected a proposal by staff to increase rates an additional 3¢/Ccf on March 1, 1995.

- Following established tradition of rotating the Presidency, the Board elected William W. Wright to serve as President and Jack Baker to serve as Vice President for calendar year 1995.
- Amendment No. 9 to the Master Agreement between the Sonoma County Water Agency and the Water Contractors was authorized by the Board. The amendment enables the Agency to either acquire, consider the acquisition, or make payments to the owner of the Potter Valley Project, if necessary, to ensure its continued operation.
- On April 30, 1995, General Manager John Olaf Nelson retired after 22 years of dedicated and loyal service to the North Marin Water District. A twelve month agreement to provide consulting services from Mr. Nelson on an as-needed basis was approved by the Board.
- Effective May 1, 1995 Chief Engineer Chris DeGabriele was appointed to the newly created position of General Manager/Chief Engineer.

FUTURE WATER SUPPLY

By 1984, recognizing the need to expand water supply entitlements from the Russian River, the regular contractors of the Sonoma County Water Agency recommended studies of ways and means of expanding entitlements by constructing facilities that would augment and optimize the regional aqueduct system. After modeling the system, Sonoma County Water Agency engineers subsequently reported that the system could be expanded by 25 mgd. The next step was for the contractors to carefully identify their future needs.

By 1992, the regular contractors completed forecast studies and made formal requests for additional entitlements totaling 28.3 mgd. Included in this amount was North Marin's request that its peak month entitlement of 11.2 mgd be increased to 19.9 mgd and further that it's annual entitlement be set at 16,244 acre-feet. The District's forecast showed, assuming achievement of 15% demand reduction by year 2015 through water conservation and after taking the new County wide plan growth projections into account and potential recycled water demand and supply, that this amount of additional entitlement together with the annual safe yield available from Stafford Lake would meet the District's long term development needs.

At the close of the fiscal year, Sonoma County Water Agency had reviewed and approved the entitlement requests and negotiation of a new revised Master Water Agreement was underway. Contract negotiations are projected to be substantially concluded in calendar 1995. An Environmental Impact Report (EIR) is required to be certified before the new Master Agreement can be adopted however. The Draft EIR is scheduled to be completed by the end of 1995 and certified in 1996. The plan is then to schedule construction of the improvements in anticipation of need over the period 1996 through year 2018 or possibly even later.

Characteristics of Service Areas

(year ending June 30, 1995)

TABLE 1

	Water			Sewer		
	Novato	Pt. Reyes/ Inv. Park	Olema	Paradise Ranch Estates	Oceana Marin	Total
■ Service Area (Square Miles)	75	21	1	1	1	100
■ Active Connections	17,425	506	43	148	184	18,394
■ Dwelling Units	20,630	512	33	150	184	21,596
■ Estimated Population	54,000	1,230	80	360	440	56,320
■ Average Household Size (People)	2.6	2.4	2.4	2.4	2.4	2.4
■ Annual Water Production (Acre-Feet):						
Stafford Lake & Treatment Plant	1,065	-	-	-	-	1,065
Russian River Aqueduct	8,714	-	-	-	-	8,714
Point Reyes Treatment Plant	-	207	42	30	-	279
Total	<u>9,779</u>	<u>207</u>	<u>42</u>	<u>30</u>	-	<u>10,058</u>
■ Net Book Value of Installed Systems	\$32,652,020	\$1,828,049	\$202,867	\$855,323	\$631,003	\$37,113,775
■ Revenue						
Water Charges	\$4,710,298	\$160,773	\$36,394	\$48,480	-	\$4,955,945
Sewer Service Charges	-	-	-	-	63,733	67,782
Connection Fees	240,306	3,975	5,550	4,115	9,000	131,515
Standby Charges	-	-	-	2,040	2,551	264,446
Taxes	498,744	20,119	243	-	20,245	5,607
Interest on Invested Funds	561,790	8,238	49	5,615	3,887	543,238
Miscellaneous	<u>376,540</u>	<u>6,321</u>	<u>1,292</u>	<u>1,001</u>	<u>85</u>	<u>585,653</u>
Total	<u>\$6,387,678</u>	<u>\$199,426</u>	<u>\$43,528</u>	<u>\$61,251</u>	<u>\$280</u>	<u>\$6,872,087</u>
■ Bonds:						
Authorized & Issued	\$9,890,000	\$467,800	\$70,000	\$240,000	\$95,894	\$10,667,800
Outstanding	\$3,670,000	\$364,000	\$51,290	\$199,000	-	\$4,284,290
■ Average Annual Water/Sewer Cost to Typical Single Family Detached Home Customer - F.Y. 1994-95:						
Variables:	\$8.00/2 mo.	\$7.00/2 mo.	\$7.00/2 mo.	\$28.00/2 mo.	\$29.00/mo.	\$37.00/mo.
Service Charge	-	-	-	-	-	-
Usage (Typical)	165 Ccf	100 Ccf	108 Ccf	74 Ccf	-	-
Water Rate	\$1.00/Ccf ¹	\$1.63/Ccf	\$1.85/Ccf	\$2.00/Ccf	-	-
Est. Assessed Valuation ²	\$176,703	\$142,460	\$178,723	n/a	\$207,542	\$107,552
Tax Rate (O&M) ³	-	1.9¢/\$100 AV	-	-	4.8¢/\$100 AV	-
Tax Rate (Bonds/Loans) ⁴	1.1¢/\$100 AV	0.1¢/\$100 AV	0.1¢/\$100 AV	-	2.8¢/\$100 AV	-
Availability Charge/Lot/Year	-	-	-	\$10/lot/yr	\$10/lot/yr	\$10/lot/yr
Typical Annual Cost:						
Service Charge	\$48.00	\$42.00	\$42.00	\$168.00	\$348.00	\$444.00
Commodity Charge	165.00	163.00	199.80	148.00	-	-
Taxes (O&M) ⁵	-	27.07	-	-	99.62	-
Taxes (Bonds/Loans)	19.44	1.42	1.79	-	-	30.11
Standby Charge	-	-	-	10.00	10.00	10.00
Total Annual Cost	<u>\$232.44</u>	<u>\$233.49</u>	<u>\$243.59</u>	<u>\$326.00</u>	<u>\$457.62</u>	<u>\$484.11</u>

¹ Weighted average commodity rate - all zones - for the fiscal year. Rates at June 30, 1995 varied from \$0.94/Ccf to \$1.23/Ccf depending on zone (elevation) to reflect different energy/pumping costs. 92% of consumption occurs in the two lowest zones. The weighted average commodity rate at June 30, 1995 was \$1.002/Ccf.

² Based on data supplied by County Assessor for the typical single family detached home in each service area. Amount is net of \$7,000 Homeowner Property Tax Exemption.

³ Equivalent rate - this is share of County's 1% (\$1/\$100 AV) allowed under Proposition 13. These taxes are assessed and collected by County of Marin.

⁴ These are voter approved taxes which are exempt from Proposition 13, and are assessed and collected by County of Marin, 10/95

⁵ This revenue is subject to diversion by the State Legislature.

TABLE 2

SUMMARY OF REGULAR EMPLOYEES - 20 Year History

Fiscal Year	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Administrative	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Commercial & Accounting	7	7	8	8	8	8	8	8	8	8	8	8	8	7.5	8	8.1	8.6	8.6	8.6	8.1
Meter Reading & Customer Service	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3.6
Engineering	9	9	8	8	6	7	7	7	7	7	6	5.8	5.8	5.8	6.8	7	8	8	8	7
Operations & Quality Control	11.5	11.5	11.5	11.5	12.5	13.5	12.5	12.5	11.5	11.6	12.6	12.7	12.7	12.8	12.8	11.8	12.8	12.8	12.8	13
Construction & Maintenance	16	15	15	15	15	15.5	15	15	15	14	14	14	14	14	15	15	16	16	16	15
Totals ¹	49.5	48.5	48.5	48.5	46.5	50.0	48.5	48.5	47.5	46.6	46.6	46.5	46.5	46.1	48.6	47.9	51.4	50.4	50.4	48.7
Per 1,000 Active Consumers ²	3.9	3.6	3.5	3.4	3.1	3.3	3.1	3.1	3.0	2.9	2.8	2.8	2.8	2.7	2.7	2.7	2.8	2.8	2.8	2.6

¹ Full time equivalent positions at fiscal year end² All service areas combined

TABLE 3
ASSESSED VALUATION AND TAX RATE

<u>Fiscal Year Ended</u>	<u>Total Assessed Value (Millions)</u>	<u>Increase (Millions)</u>	<u>Percentage Increase</u>	<u>Tax Rate Per \$100 A.V.</u>	<u>Total Tax Derived</u>
1958	\$ 16.8	\$ 2.5	17.5	\$.280	\$ 45,290
1959	19.2	2.4	14.3	.370	66,290
1960	19.9	.7	2.7	.320	64,130
1961	25.7	5.8	29.1	.320	81,077
1962	28.5	2.8	10.9	.320	90,225
1963	30.2	1.7	6.1	.320	96,369
1964	41.8	11.6	38.4	.270	112,107
1965	47.4	5.6	13.4	.220	103,156
1966	55.1	7.7	16.2	.220	120,215
1967	63.2	8.1	14.7	.170	106,731
1968	77.0	13.8	21.8	.170	129,047
1969	77.9	.9	1.3	.150	121,911
1970	80.5	2.6	3.2	.150	122,324
1971	87.7	7.2	8.9	.120	107,143
1972	100.0	12.4	14.1	.100	109,185
1973	108.3	8.2	8.2	.100	98,641
1974	116.0	7.7	7.3	.090	115,060
1975	144.9	28.9	24.9	.080	114,943
1976	163.3	18.4	12.7	.076	116,535
1977	198.4	35.1	21.5	.060	120,883
1978	236.5	38.5	19.4	.050	125,849
1979	236.0	(0.5)	(0.2)	.050	122,117
1980	286.9	50.9	21.6	.040	117,122
1981	332.9	46.0	16.0	.040	132,111
1982	1,502.0*	170.2	12.8	.025	351,189
1983	1,654.9	152.9	10.2	.025	407,053
1984	1,773.7	118.8	7.2	.025	451,788
1985	1,913.2	139.5	7.9	.025	491,321
1986	2,171.8	258.6	13.5	.023	484,360
1987	2,265.9	94.1	4.3	.021	503,544
1988	2,477.7	211.8	9.3	.026	689,760
1989	2,624.5	146.8	5.9	.022	646,422
1990	2,937.7	313.2	11.9	.018	587,316
1991	3,252.1	314.4	10.7	.016	597,532
1992	3,508.1	256.0	7.9	.014	555,397
1993	3,759.4	251.3	7.2	.013	554,475
1994	3,969.0	209.6	5.6	.012	568,118
1995	4,174.8	205.8	5.2	.011	498,744

* Basis changed from 25% to 100% of assessed valuation commencing in 1982.

TABLE 4
ANNUAL STATISTICAL SUMMARY

<u>Fiscal Year</u>	<u>Metered Services (Active)</u>	<u>Meters Installed</u>	<u>Fire Hydrants</u>	<u>Pipeline Miles</u>	<u>Distribution Storage - MG</u>
1972	9,787	10,406	1,053	187	21.01
1973	10,476	11,094	1,072	189	21.01
1974	11,101	11,831	1,151	194	21.07
1975	11,644	12,470	1,209	193	26.53
1976	12,343	12,911	1,233	199	26.53
1977	12,892	13,363	1,283	207	26.53
1978	13,432	13,826	1,319	208	26.53
1979	14,065	14,714	1,429	215	26.53
1980	14,495	14,913	1,475	223	26.53
1981	14,666	15,096	1,540	227	26.78
1982	14,756	15,300	1,572	233	27.23
1983	14,837	15,426	1,588	237	27.23
1984	14,975	15,561	1,618	239	27.23
1985	15,403	16,042	1,670	240	27.23
1986	15,727	16,335	1,695	243	27.23
1987	16,061	16,544	1,739	246	27.23
1988	15,945	16,490	1,795	249	27.51
1989	16,481	16,845	1,841	253	27.51
1990	16,906	17,296	1,876	260	27.51
1991	17,032	17,340	1,880	266	27.51
1992	17,132	17,425	1,921	268	27.51
1993	17,203	17,525	1,936	271	27.51
1994	17,297	17,669	1,950	273	27.63
1995	17,425	17,762	1,963	274	27.63
Increase (Decrease) Over Last Period	0.7%	0.5%	0.7%	0.4%	0.0%

TABLE 5

SOURCE OF ANNUAL WATER PRODUCTION

<u>Fiscal Year Ended June 30</u>	<u>Total Output (acre-feet)</u>	<u>Stafford Lake (acre-feet)</u>	<u>MMWD (acre-feet)</u>	<u>Russian River</u>	
				<u>Actual (acre-feet)</u>	<u>Contract Guarantee (acre-feet)</u>
1961	2,138.6	2,138.6	0	0	0
1962	2,233.8	1,830.5	0	403.3	263.0
1963	2,620.4	1,704.6	0	915.8	900.0
1964	2,927.3	1,939.3	0	988.0	1,200.0
1965	3,493.4	1,694.0	0	1,799.4	1,600.0
1966	4,051.0	2,111.4	0	1,939.6	1,900.0
1967	4,025.9	1,992.1	0	2,033.8	2,300.0
1968	4,847.8	2,223.4	0	2,624.4	2,600.0
1969	4,817.3	1,929.1	0	2,888.2	3,000.0
1970	5,604.8	1,955.5	0	3,649.3	3,400.0
1971	5,620.5	1,953.6	0	3,666.9	3,800.0
1972	6,408.7	1,870.6	0	4,538.1	4,200.0
1973	6,344.8	1,792.7	0	4,552.1	4,600.0
1974	6,536.7	1,252.8	0	5,284.7	5,000.0
1975	6,910.0	2,080.7	0	4,829.3	0
1976	7,635.6	1,690.3	0	5,945.3	0
1977	6,325.9 ¹	1,020.7	0	5,305.2	0
1978	5,345.8	2,022.1	0	3,323.7	0
1979	7,001.1	2,118.1	0	4,883.0	0
1980	7,549.4	1,414.4	0	6,135.0	0
1981	8,507.7	604.2	0	7,903.5	0
1982	8,183.2	2,029.9	0	6,153.3	0
1983	8,125.8	2,574.6	0	5,541.2	0
1984	9,253.2	2,532.2	0	6,721.0	0
1985	9,436.0	684.2	128.7	8,623.0	0
1986	9,351.6	1,027.7	0	8,323.9	0
1987	9,803.4	1,902.2	0	7,901.2	0
1988	9,890.7 ²	973.8	0	8,916.9	0
1989	9,549.2 ³	1,187.9	0	8,361.3	0
1990	9,543.1 ⁴	1,156.6	0	8,386.5	0
1991	10,101.5 ⁵	1,217.2	0	8,884.3	0
1992	9,499.9 ⁶	1,438.3	0	8,061.6	0
1993	9,142.6 ⁷	1,952.1	0	7,190.5	0
1994	9,769.9 ⁸	1,916.9	0	7,853.0	0
1995	9,779.0	1,065.4	0	8,713.6	0

1 Does not include 3,688 AF backfed to Stafford Lake for drought relief.

2 Does not include 200 AF backfed to Stafford Lake for drought relief.

3 Does not include 782 AF backfed to Stafford Lake for drought relief and 493.2 AF sold to MMWD.

4 Does not include 1,497.3 AF sold to MMWD.

5 Does not include 991.8 AF backfed to Stafford Lake for drought relief and 2,419.5 AF sold to MMWD.

6 Does not include 2,527.9 AF sold to MMWD.

7 Does not include 17.3 AF sold to MMWD.

8 Does not include 20.6 AF of "Trade Water" wheeled to MMWD.

TABLE 6

WATER PRODUCTION

Fiscal Year Ended June 30	Millions of Gallons				Water Production in Millions of Gallons/Day			
	Water Produced	Water Sold	Diff.	Percent Diff.	Annual	Peak Month*	Peak Week	Peak Day
1955	333	273	60	18.0	.91	1.35 (JI)	-	1.78
1956	441	345	96	21.7	1.21	2.15 (J)	-	2.80
1957	451	407	44	9.8	1.24	1.98 (JI)	-	2.66
1958	514	462	52	10.1	1.41	2.34 (JI)	-	2.94
1959	705	647	58	8.2	1.93	3.03 (J)	-	3.74
1960	707	690	17	2.4	1.94	3.30 (JI)	-	3.93
1961	697	681	16	2.3	1.91	3.19 (JI)	-	3.90
1962	728	727	1	0.1	2.00	3.39 (J)	-	4.70
1963	854	769	85	11.1	2.34	3.86 (J)	-	4.83
1964	954	891	63	7.0	2.61	4.08 (JI)	-	5.60
1965	1,138	1,051	87	8.3	3.12	4.88 (J)	5.22	6.26
1966	1,320	1,237	83	6.3	3.62	5.94 (J)	7.24	7.88
1967	1,312	1,295	17	1.3	3.58	5.78 (JI)	6.45	7.78
1968	1,580	1,493	87	5.5	4.35	6.97 (J)	7.33	9.22
1969	1,570	1,559	11	0.7	4.30	7.06 (JI)	7.70	9.02
1970	1,826	1,710	116	6.4	5.00	7.50 (A)	7.94	9.16
1971	1,831	1,737	95	5.2	5.02	8.02 (JI)	8.82	10.45
1972	2,088	1,934	154	7.4	5.72	8.49 (JI)	9.54	10.92
1973	2,068	1,953	115	5.6	5.67	9.25 (J)	10.00	11.56
1974	2,130	2,005	125	5.9	5.84	9.37 (J)	10.10	11.51
1975	2,252	2,181	71	3.2	6.17	9.31 (J)	10.43	12.06
1976	2,488	2,298	190	7.6	6.82	10.08 (J)	12.26	12.68
1977	2,061	1,808	253	12.3	5.64	10.11 (JI)	10.60	11.27
1978	1,742	1,597	145	8.3	4.76	8.68 (J)	9.10	10.41
1979	2,281	2,123	158	6.9	6.25	10.14 (J)	11.18	12.00
1980	2,460	2,263	197	8.0	6.74	10.23 (JI)	11.11	12.54
1981	2,772	2,534	238	8.6	7.59	12.33 (J)	14.29	15.68
1982	2,667	2,448	218	8.2	7.31	11.58 (JI)	12.13	13.03
1983	2,648	2,436	212	8.0	7.26	11.06 (J)	11.95	13.32
1984	3,015	2,654	361	12.0	8.26	12.05 (JI)	13.49	15.44
1985	3,075	2,752	323	10.5	8.42	12.75 (JI)	13.73	15.42
1986	3,048	2,831	217	7.1	8.35	12.70 (JI)	13.39	15.60
1987	3,194	3,002	192	6.0	8.75	12.81 (JI)	13.01	14.22
1988	3,223	2,974	249	7.7	8.83	12.57 (A)	13.48	15.00
1989	3,112	2,873	239	7.7	8.53	12.44 (JI)	13.12	14.97
1990	3,110	2,924	186	6.0	8.52	13.09 (JI)	13.47	14.95
1991	3,292	2,943	349	10.6	9.02	12.92 (JI)	13.55	14.24
1992	3,096	2,753	343	11.1	8.48	11.50 (JI)	12.31	13.79
1993	2,979	2,843	136	4.6	8.16	12.25 (A)	13.35	14.94
1994	3,187	2,973	214	6.7	8.73	13.18 (JI)	14.14	16.75
1995	3,186	2,886	301	9.4	8.73	13.59 (A)	14.45	16.09

* Letters in () designate Peak Month, i.e., J = June, JI = July, A = August.

TABLE 7
OPERATING FINANCIAL HISTORY

Fiscal Year Ended	Operating Revenue ¹		Operating Expense				Net Operating Income	
	Total	Per Active Connection	Russian River Water Purchases ²	Other Expense ³	Total	Total Expense Per Active Connection ⁴	Total	Per Active Connection
1955	\$ 137,469	\$ 50.80	-	\$ 74,960	\$ 74,960	\$ 27.70	\$62,509	\$23.10
1956	162,532	49.86	-	87,529	87,529	26.85	75,003	23.01
1957	208,187	55.35	-	142,399	142,399	37.86	65,788	17.49
1958	230,266	57.64	-	131,037	131,037	32.76	99,229	24.84
1959	326,317	75.40	-	172,486	172,486	39.85	153,831	35.54
1960	344,507	73.16	-	169,512	169,512	36.00	174,995	37.16
1961	371,812	74.38	-	163,167	163,167	32.64	208,645	41.74
1962	373,777	71.10	38,419	170,847	209,266	39.81	164,511	31.29
1963	398,139	70.19	72,610	155,647	228,257	40.24	169,883	29.95
1964	460,713	77.25	77,469	182,703	260,172	43.62	200,541	33.63
1965	535,074	79.29	121,291	195,846	317,137	47.00	217,937	32.30
1966	604,367	78.99	126,427	223,081	349,508	45.83	252,859	33.16
1967	645,161	80.48	148,847	305,855	454,702	56.72	190,459	23.76
1968	717,697	85.85	181,050	288,758	469,808	56.20	247,889	29.65
1969	727,404	83.28	191,452	315,951	507,403	58.10	220,001	25.19
1970	802,911	88.64	234,355	340,593	574,948	63.47	227,963	25.17
1971	822,239	88.01	211,122	378,575	589,697	63.12	232,542	24.89
1972	906,091	92.58	232,085	374,225	606,310	61.95	299,781	30.63
1973	905,598	86.45	255,199	482,560	737,759	70.42	167,839	16.02
1974	972,709	87.62	248,792	560,060	808,852	72.86	163,857	14.76
1975	1,152,159	98.95	255,388	689,370	944,758	81.14	207,401	17.81
1976	1,411,758	114.38	345,035	817,817	1,162,852	94.21	248,906	20.17
1977	1,584,907	122.94	358,477	1,061,554	1,420,031	110.15	164,876	12.79
1978	1,910,494	142.23	269,594	961,892	1,231,486	91.68	679,008	50.55
1979	1,726,660	122.76	301,511	1,064,676	1,366,187	97.13	360,473	25.63
1980	1,897,517	130.91	349,039	1,106,840	1,455,879	100.44	441,638	30.47
1981	2,114,081	144.15	277,785	1,264,305	1,542,090	105.15	571,991	39.00
1982	2,423,076	164.21	674,796	1,488,686	2,163,482	146.62	259,594	17.59
1983	2,531,824	170.64	703,166	1,713,211	2,416,377	162.86	115,447	7.78
1984	2,944,409	196.62	900,233	1,946,947	2,847,180	190.13	97,229	6.49
1985	3,062,653	198.83	1,087,654	1,780,016	2,867,670	186.18	194,983	12.66
1986	3,208,922	204.04	1,007,600	2,106,043	3,113,643	197.98	95,279	6.06
1987	3,465,489	215.77	1,006,083	2,188,870	3,194,953	198.93	270,536	16.84
1988	3,458,691	216.91	1,250,071	2,242,801	3,492,872	219.06	(34,181)	(2.14)
1989	3,589,336	217.79	1,301,204	2,526,200	3,827,404	232.23	(238,068)	(14.44)
1990	3,833,099	226.73	1,464,866	2,608,895	4,073,761	240.97	(240,662)	(14.24)
1991	4,460,144	261.87	1,645,940	3,402,329	5,048,269	296.40	(558,125)	(34.53)
1992	4,405,595	257.16	1,547,816	3,760,064	5,307,880	309.82	(902,285)	(52.67)
1993	4,356,185	253.22	1,344,383	3,601,388	4,945,771	287.49	(589,586)	(34.27)
1994	4,829,774	279.23	1,535,094	3,573,666	5,108,760	295.36	(278,988)	(16.13)
1995	4,807,617	275.90	1,736,302	3,723,211	5,459,513	313.31	(651,897)	(37.41)

¹ Includes income from water sales, wheeling charges and other misc. operating income. Does not include connection fees, contributions in aid of construction, interest earnings, rents & leases, taxes, or other non-operating income which totaled \$1,948,332 for FY 1994.

² Water purchases and in-lieu taxes paid to Sonoma County Water Agency (excluding water purchased for resale).

³ Includes source of supply, pumping, operations, treatment, transmission and distribution, consumer accounting and administrative expenses. Excludes depreciation, debt service, equipment purchases, capital additions and improvements, engineering studies and miscellaneous non-operating expenses.

⁴ Operating expense ÷ active connections.

TABLE 8

WATER RATE/CHARGE HISTORY

Bimonthly Minimum		Rate (\$/Ccf) Per Block				
<u>June 30</u>	<u>Charge</u>	<u>0-8 Ccf</u>	<u>9-39 Ccf</u>	<u>40-79 Ccf</u>	<u>80 + Ccf</u>	
1958	\$ 4.50	\$ 0.00	\$ 0.31	\$ 0.28	\$ 0.25	
1959	4.50	0.00	0.31	0.28	0.25	
1960	4.50	0.00	0.31	0.28	0.25	
1961	4.50	0.00	0.31	0.28	0.25	
1962	4.50	0.00	0.31	0.28	0.25	
1963	4.50	0.00	0.31	0.28	0.25	
1964	4.50	0.00	0.31	0.28	0.25	
1965	4.50	0.00	0.31	0.28	0.25	
1966	4.50	0.00	0.31	0.28	0.25	
1967	4.50	0.00	0.31	0.28	0.25	
1968	4.00	0.00	0.31	0.28	0.25	
1969	4.00	0.00	0.31	0.28	0.25	
1970	4.00	0.00	0.31	0.28	0.25	
1971	4.00	0.00	0.31	0.28	0.25	
1972	4.00	0.00	0.31	0.28	0.25	
1973	4.00	0.00	0.31	0.28	0.25	
1974 ¹	4.00	0.29	0.29	0.29	0.29	
1975	4.00	0.31	0.31	0.31	0.31	
1976	4.00	0.33	0.33	0.33	0.33	
1977 ²	5.00	0.37	0.37	0.37	0.37	
1978	5.00	0.40	0.40	0.40	0.40	
1979	5.00	0.43	0.43	0.43	0.43	
1980	5.00	0.45	0.45	0.45	0.45	
1981	5.00	0.45	0.45	0.45	0.45	
		<u>Zone A</u>	<u>Zone B</u>	<u>Zone C</u>	<u>Zone D</u>	<u>Weighted</u>
		<u>(0-60 ft)</u>	<u>(60-200 ft)</u>	<u>(200-400 ft)</u>	<u>(400+ ft)</u>	<u>Average⁴</u>
1982 ³	5.00	\$ 0.55	\$ 0.59	\$ 0.63	\$ 0.66	\$ 0.57
1983	5.00	0.59	0.63	0.67	0.70	0.61
1984	5.00	0.63	0.67	0.71	0.74	0.65
1985	5.00	0.67	0.71	0.75	0.78	0.69
1986	5.00	0.67	0.71	0.75	0.78	0.69
1987	6.00	0.67	0.71	0.75	0.78	0.69
1988	6.00	0.67	0.71	0.75	0.78	0.69
1989	6.00	0.69	0.73	0.77	0.80	0.71
1990	6.00	0.70	0.74	0.78	0.81	0.72
1991	6.00	0.75	0.85	0.94	1.04	0.78
1992	8.00	0.81	0.91	1.00	1.10	0.82
1993	8.00	0.86	0.96	1.05	1.15	0.89
1994	8.00	0.91	1.01	1.10	1.20	0.94
1995	8.00	0.94	1.04	1.13	1.23	1.00

1 In 1974 District converted to a uniform commodity rate.

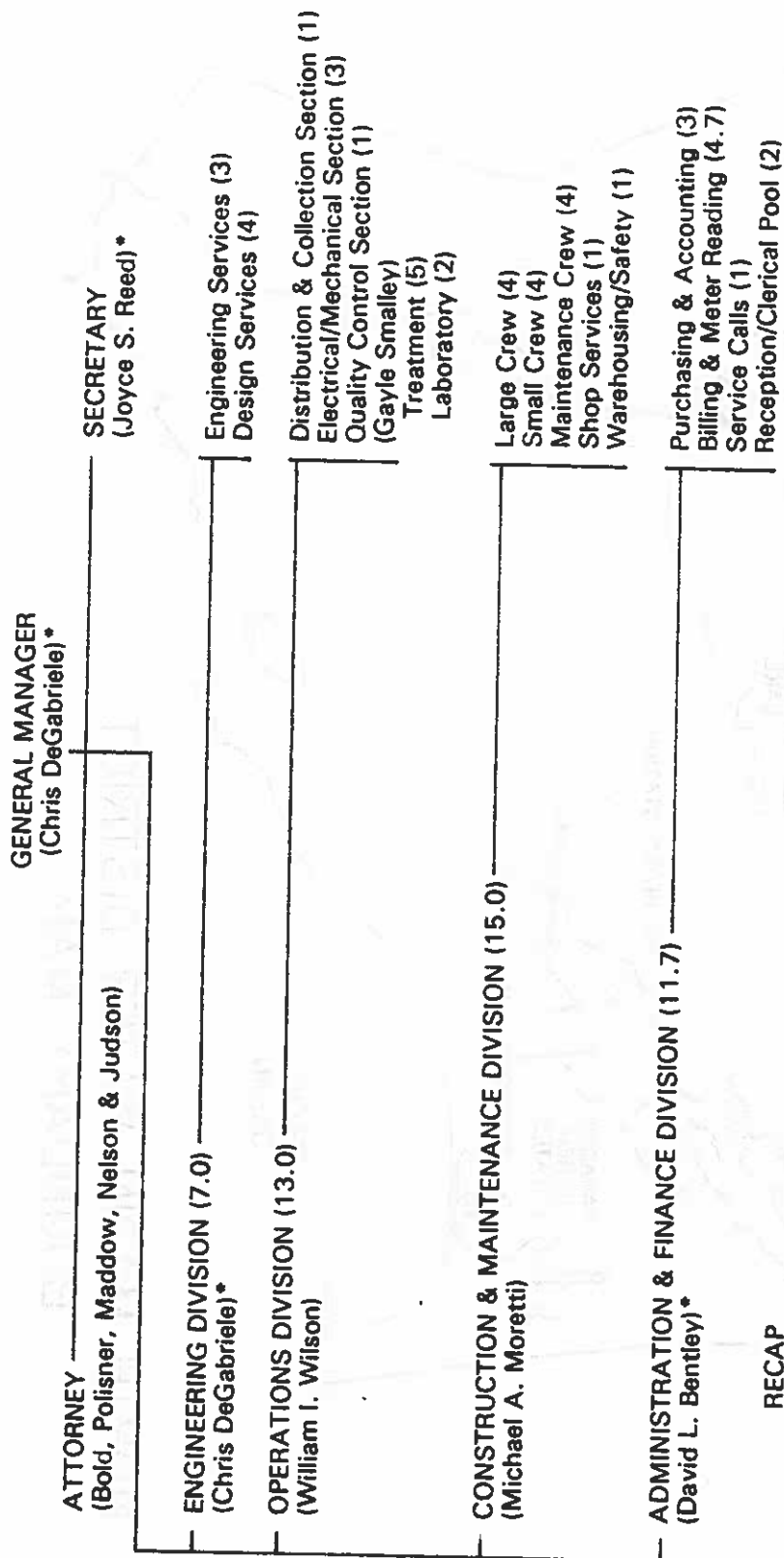
2 Excludes drought surcharges of \$2.25 (minimum charge) and \$0.13/ccf (commodity rate) which were temporarily in effect from May 1, 1977 to July 1, 1978.

3 In 1982 District made uniform rate a function of energy costs associated with lifting water to the various services zones.

4 Bimonthly charges and commodity rates shown above were in effect on June 30 of each respective year. The weighted average rate in effect during the fiscal year is based upon the consumption occurring within each of the distribution zones and then further adjusted to reflect mid-year changes in rates and charges. Water use distribution coefficients are:

	<u>Pre 89</u>	<u>FY 89-94</u>
Zone A	48.0%	45.5%
Zone B	45.0%	46.3%
Zone C	6.0%	6.9%
Zone D	1.0%	1.3%

NORTH MARIN WATER DISTRICT ORGANIZATION CHART



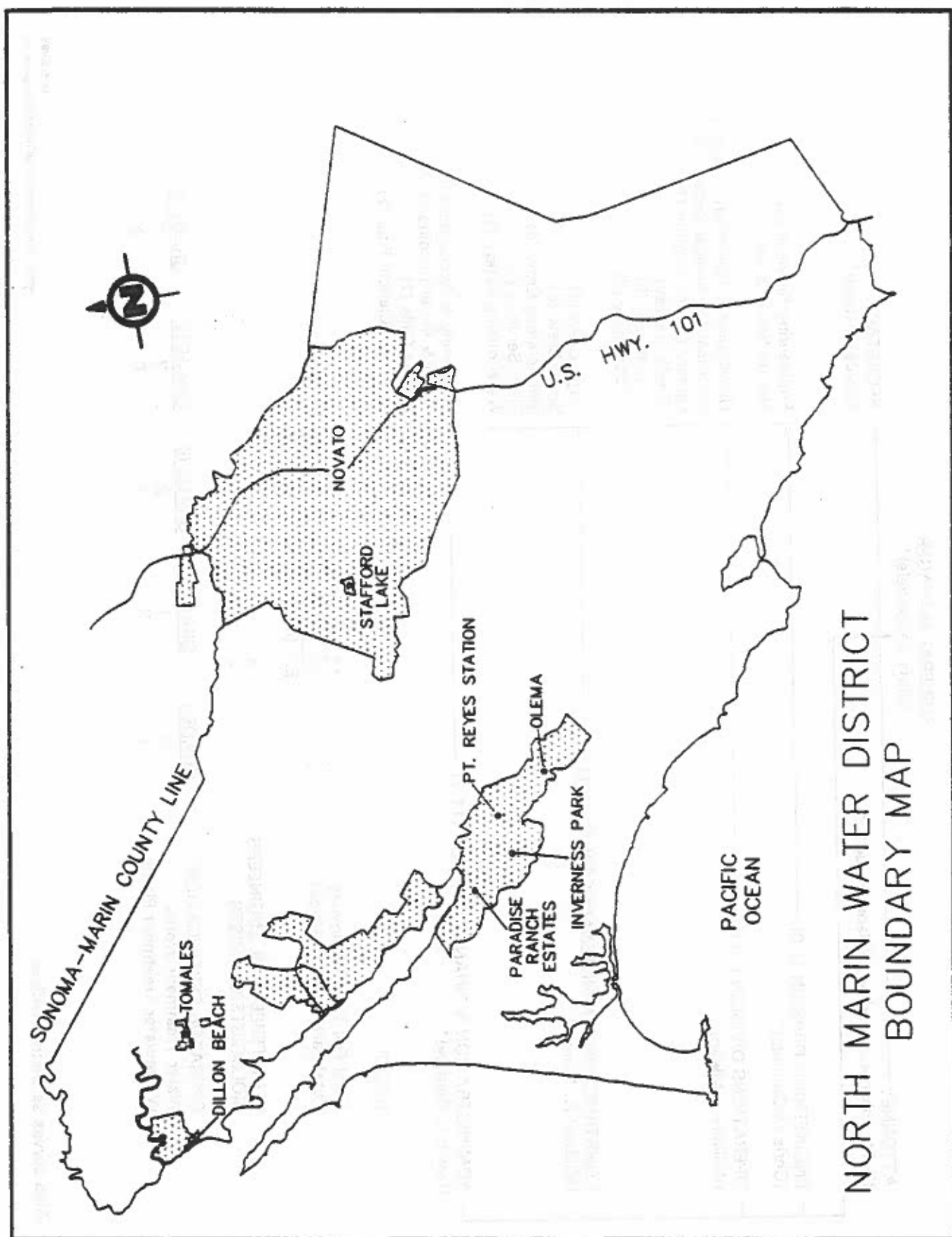
Total Full Time Employees 43 (43.0 equivalent full time)
 Total Part Time Employees 10 (5.7 equivalent full time)
 53 (48.7 equivalent full time)

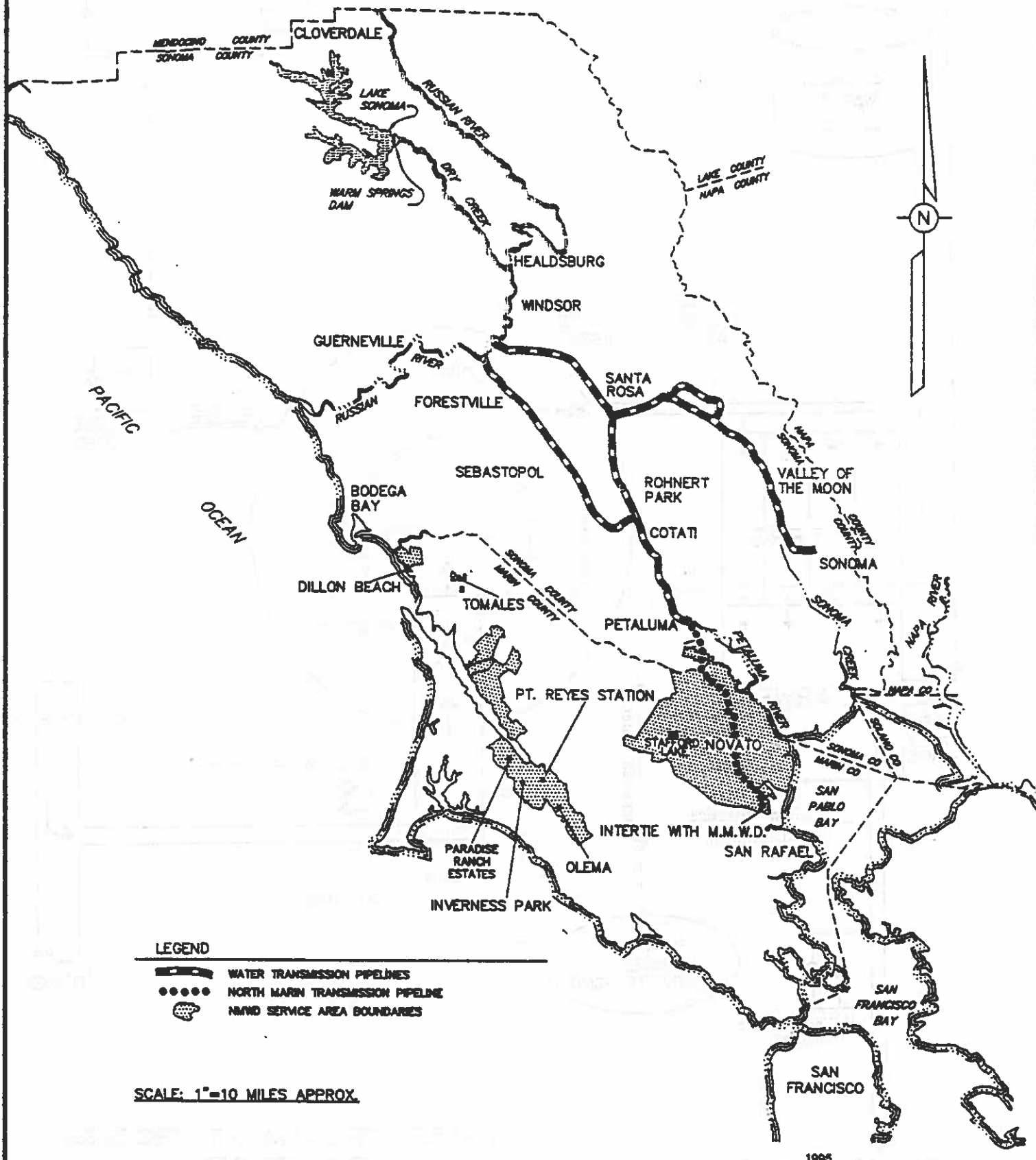
REGISTERED CIVIL ENGINEERS 4
 BIOLOGISTS/CHEMISTS 4

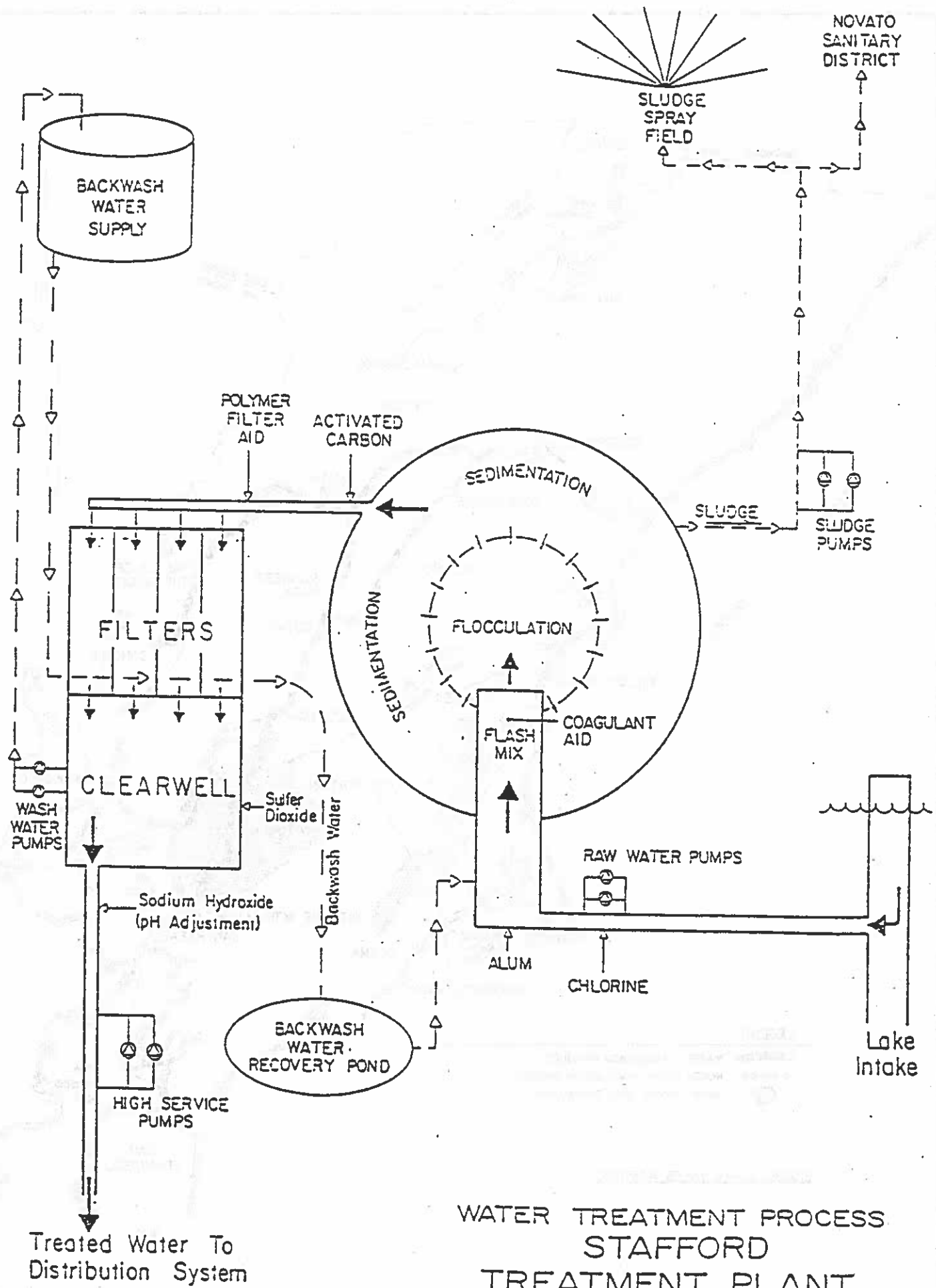
OPERATOR CERTIFICATION:
 Water Treatment Works
 Wastewater Treatment Plants

GRADE I	GRADE II	GRADE III	GRADE IV	GRADE V
0	1	2	2	2
1	3	1	0	0

• Also serves as District Officer







WATER TREATMENT PROCESS
STAFFORD
TREATMENT PLANT
NORTH MARIN COUNTY WATER DISTRICT
NOVATO, CALIFORNIA

STAFFORD LAKE INFORMATION SHEET

Location On Novato Creek, four miles west of downtown Novato adjacent to Novato Boulevard (old Hicks Valley Road)

Owner All of Stafford Lake and lands adjacent to the shoreline are owned by North Marin Water District)

Beneficial Uses

Water Supply - provides 15 to 20% of the Novato area's water supply

Recreation - fishing from shoreline only; Marin County Regional Park, Indian Valley Golf Course (open to public); hiking, etc.

Cattle Grazing - in areas fenced off from lake shoreline

Flood Control - incidental, provided lake is not spilling

Dam

Type: Earthfill
Height: 80 feet above streambed at outlet tower, crest el. 214 feet MSL
Length: 730 feet, including spillway
Width: 400 feet at base, excluding toe fill; 15 feet at crest
Year installed: 1952

Reservoir

Drainage Area: 8.3 square miles

	<u>Lake Full (El. 196)</u>	<u>Normal Minimum Level (El. 180)</u>
Volume:	4250 acre-feet	1500 acre-feet
Water Surface Area:	230 acres	120 acres
Water Storage Depth:	46 feet	30 feet

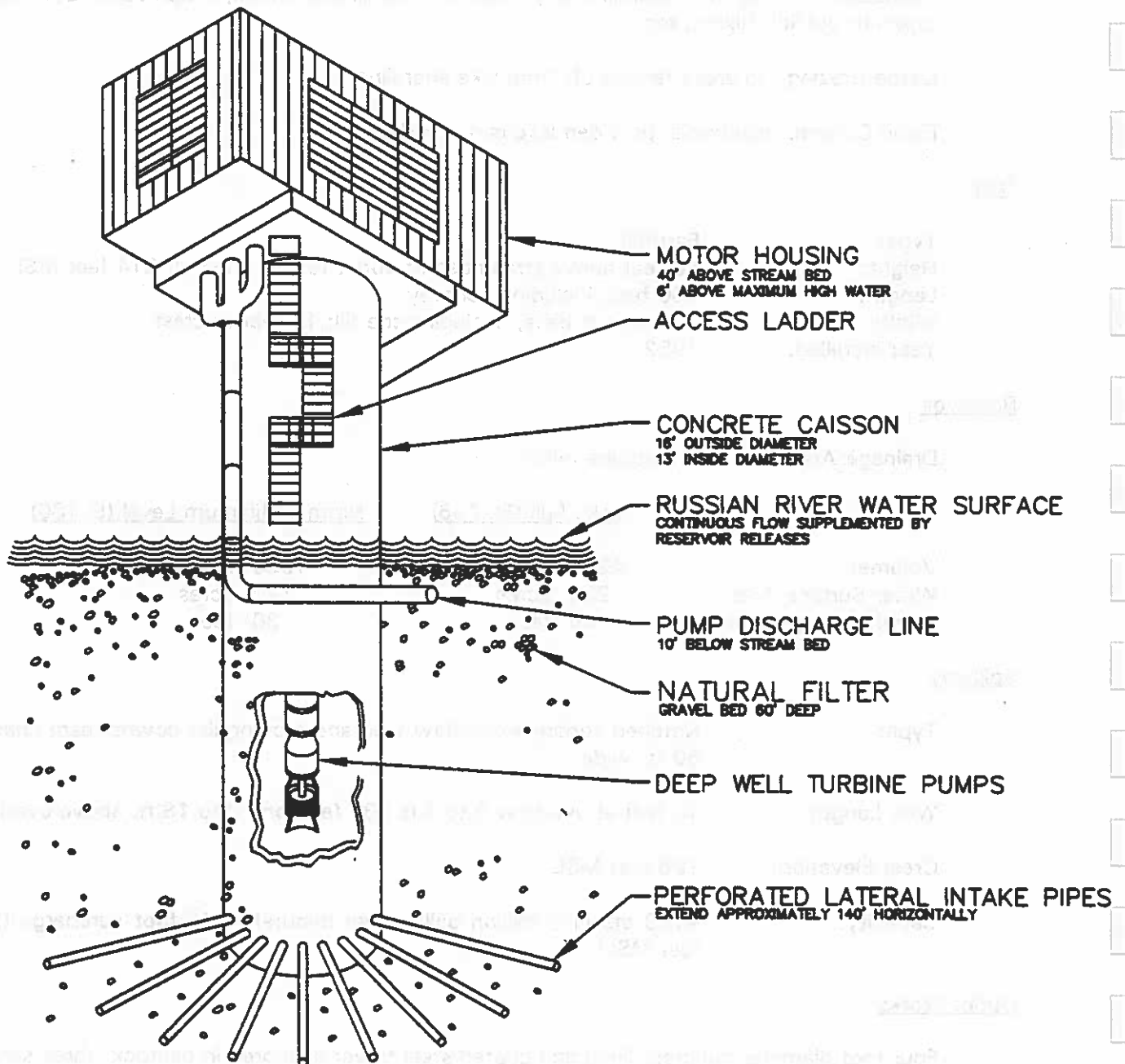
Spillway

Type: Notched concrete overflow weir and rectangular downstream channel 50 ft. wide
Weir Length: 10 feet at overflow 0 to 3 ft.; 32 feet long 3 to 18 ft. above overflow
Crest Elevation: 196 feet MSL
Capacity: 4150 cfs (1.9 million gallons per minute) at 13-foot surcharge (209 feet MSL)

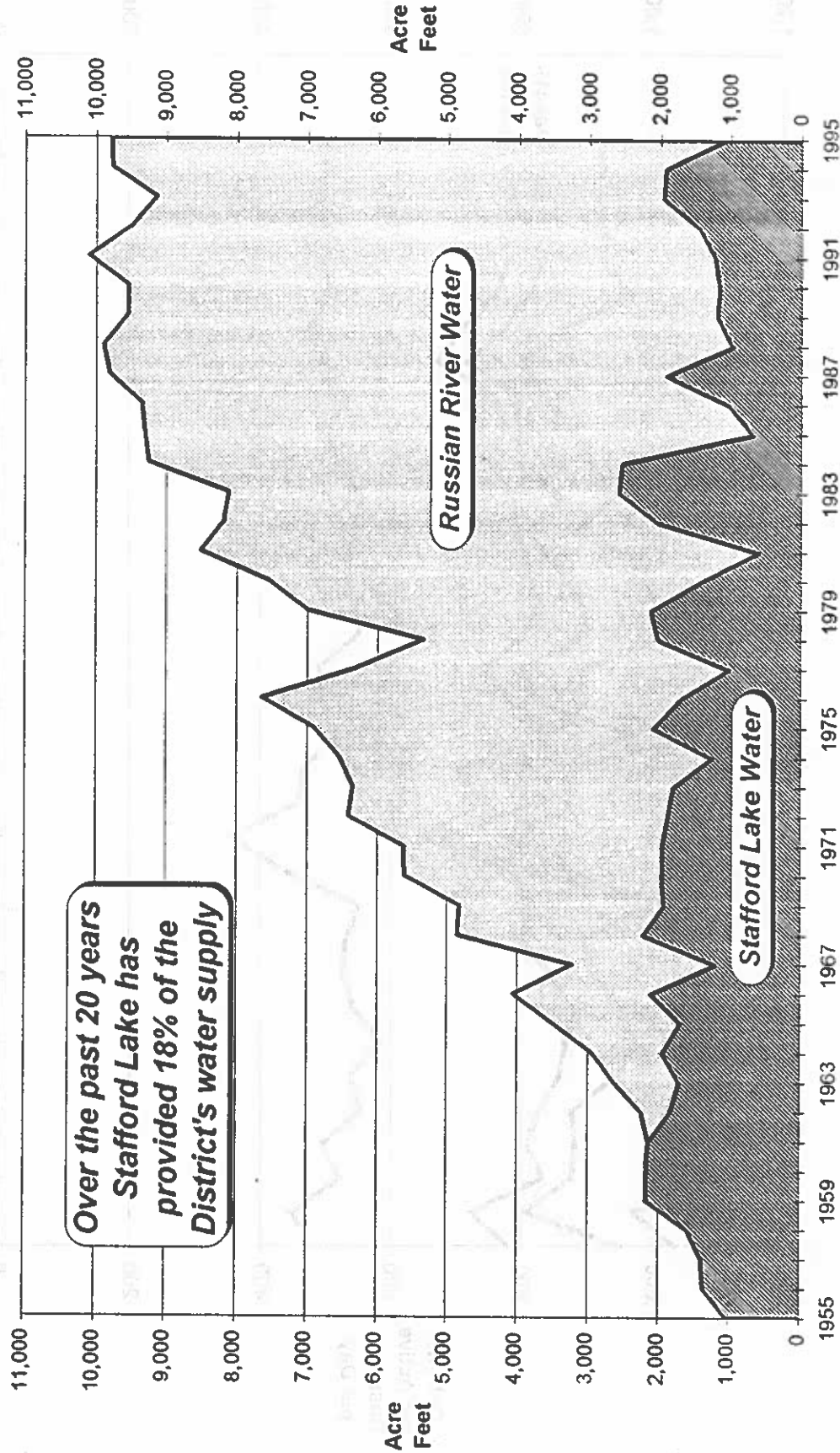
Outlet Works

Four foot diameter concrete lined and coated steel tower anchored in bedrock; three service water supply) gates at elevation 185, 173, and 158 feet MSL. 30-inch diameter sluice gate at elevation 145; 30-inch outlet pipe at elevation 131 extending under dam to Novato Creek and Stafford Treatment Plant. Maximum sluice capacity: 100 cfs.

TYPICAL RANNEY WATER COLLECTOR OF THE RUSSIAN RIVER PROJECT



WATER PRODUCTION



Over the past 20 years
Stafford Lake has
provided 18% of the
District's water supply

Russian River Water

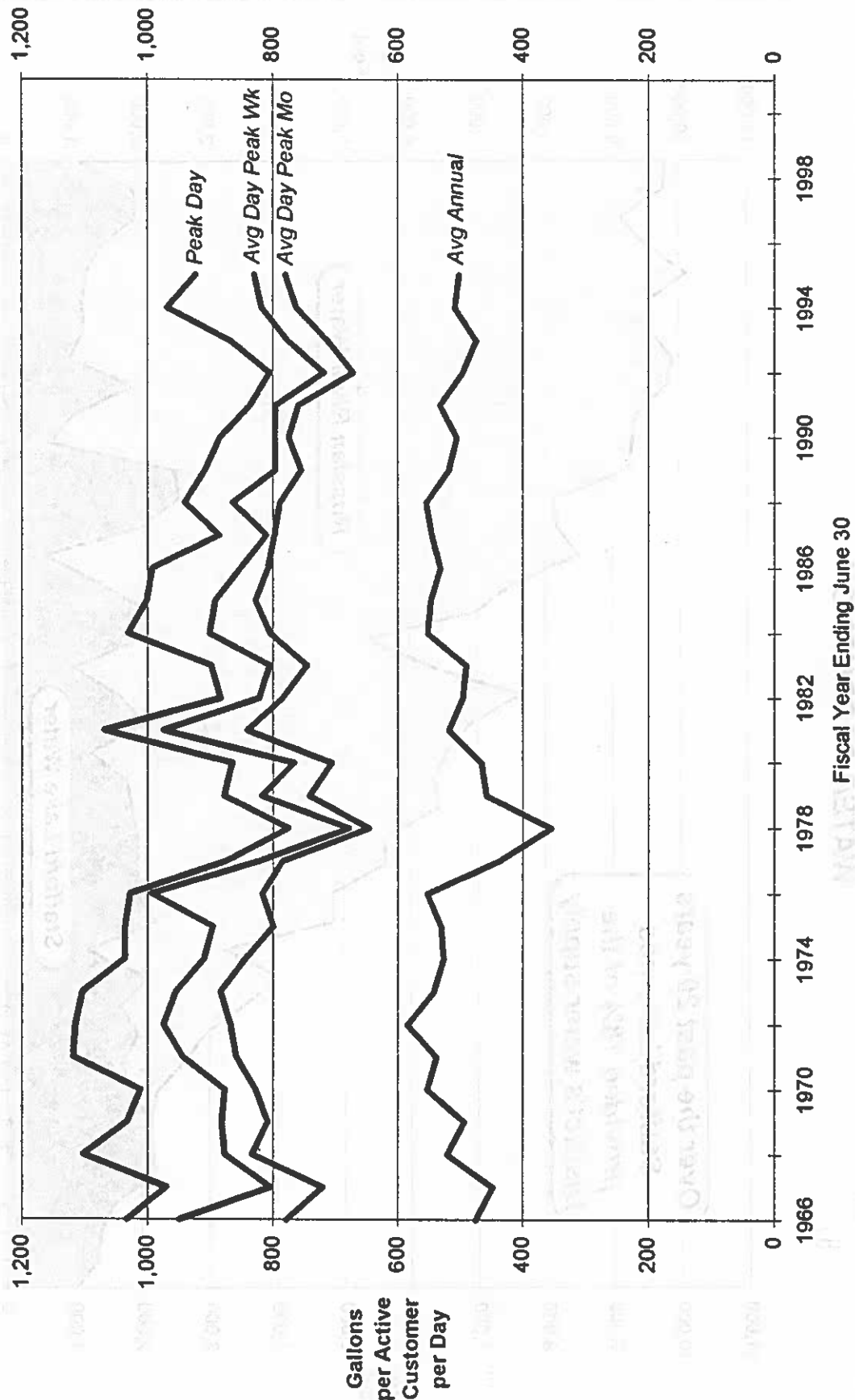
Stafford Lake Water

Fiscal Year Ending June 30

9/29/95

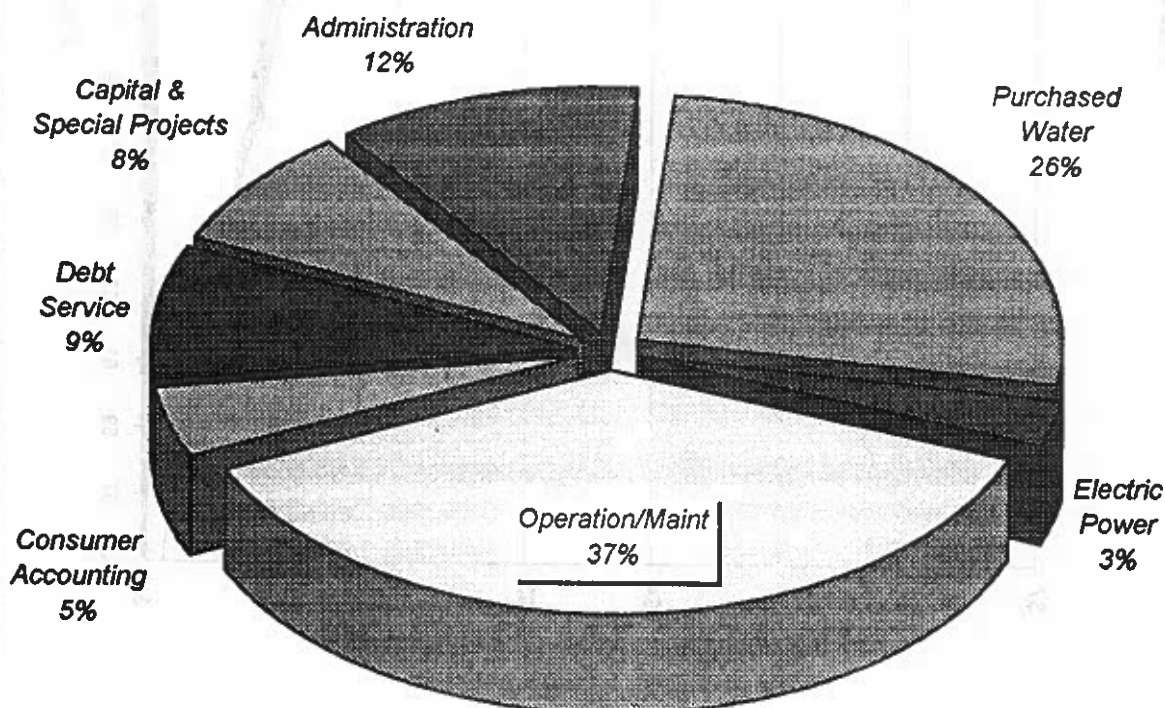
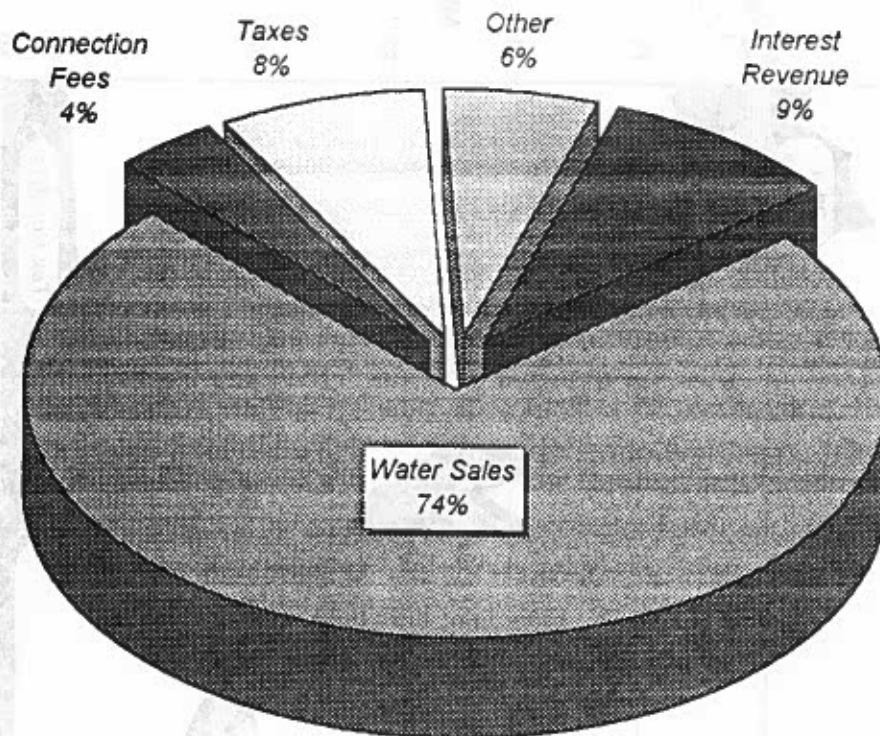
dfb>c:\excel\annual\pltoons_svc.xls chart

WATER CONSUMPTION PER SERVICE

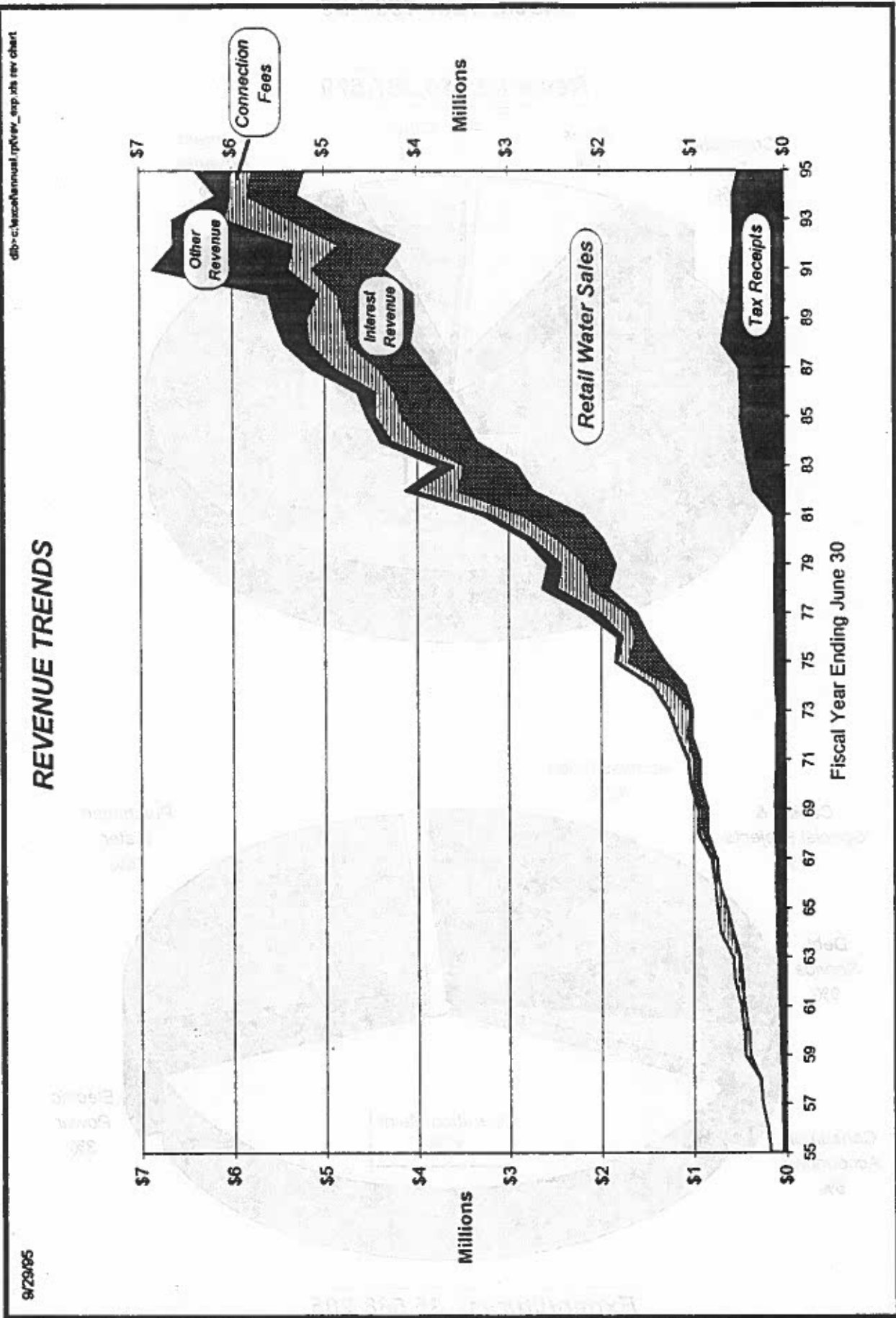


Fiscal Year 1994-95

Revenue: \$6,387,679



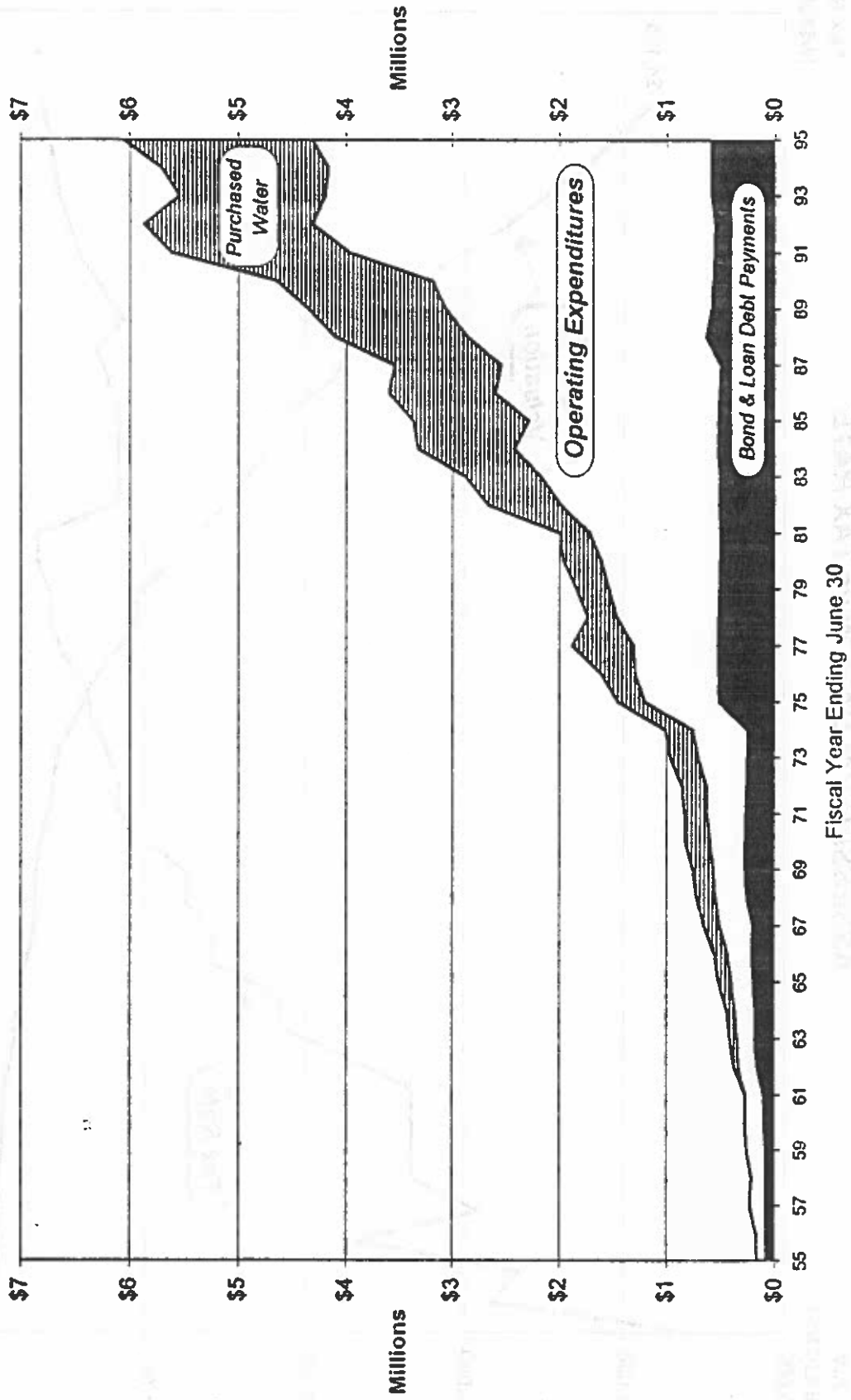
Expenditures: \$6,588,205

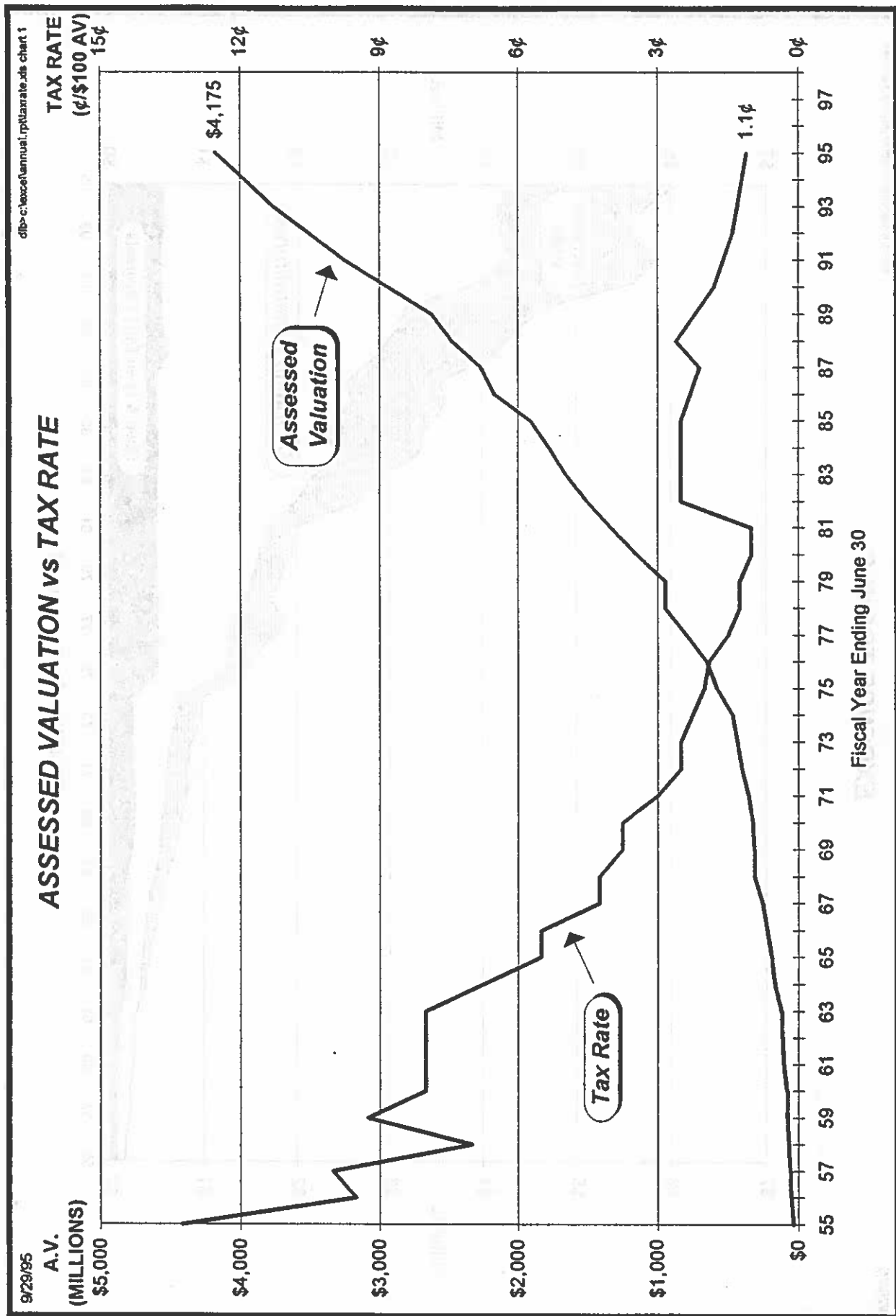


9/20/95

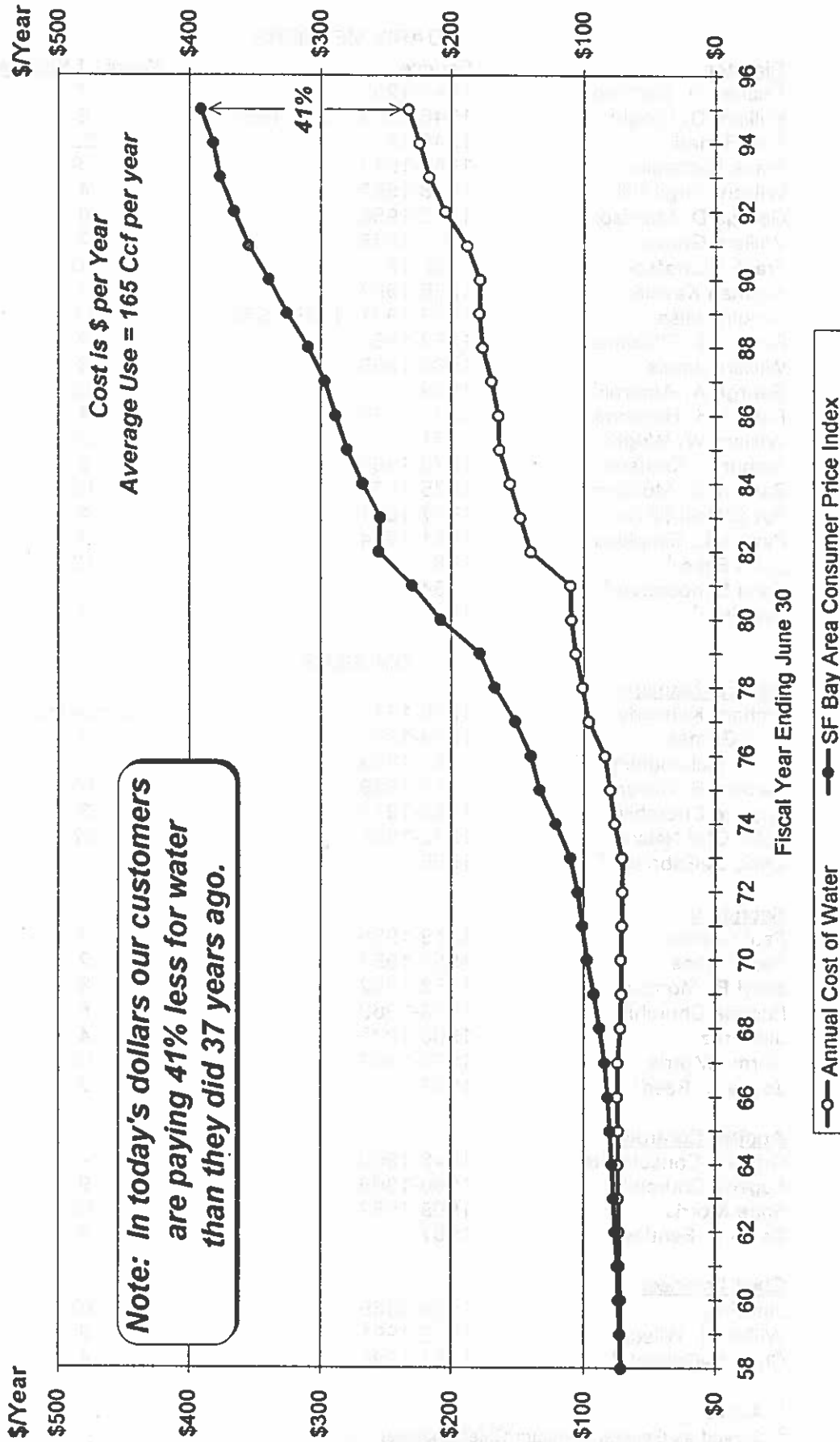
d:\p-c\excel\annual\pfree_exp.xls exp chart

EXPENSE TRENDS





INCREASE IN TOTAL COST OF WATER SERVICE TO TYPICAL SINGLE FAMILY RESIDENCE COMPARED TO GROWTH IN CPI



**North Marin Water District
Chronology of Board Members and Officers
June 30, 1995**

BOARD MEMBERS

<u>Director</u>	<u>Service</u>	<u>Years of Service</u>
Charles D. Stafford	1948-1955	7
William Q. Wright	1948-1953; 1955-1956	6
Emil Renati	1948-1971	23
Frank Baccaglio	1948-1977	29
William Virgil Hill	1948-1952	4
George D. Morrison	1952-1958	6
William Gness	1953-1955	2
Frank Gustafson	1955-1975	20
Norman Kaehler	1956-1957	1
Arnold Heise	1957-1971; 1975-1975	14
Richard L. O'Connell	1958-1960	2
William Jonas	1960-1969	9
George A. Amaroli ¹	1969-	26
Patrick H. Heffernan	1971-1975	4
William W. Wright ¹	1971-	24
Arthur T. Knutson	1975-1983	8
Barbara B. Munden	1975-1991	16
Pat O'Neill (U'Ren)	1977-1981	4
Patrick L. Simpkins	1981-1984	3
John Baker ¹	1983-	12
John Schoonover ¹	1984-	11
Jim Fritz ¹	1991-	4

OFFICERS

<u>General Manager</u>		3 months
Richard Kennedy	1949-1949	7
Paul Grimes	1949-1956	2
A. T. McLaughlin	1957-1959	10
Jerome B. Gilbert ²	1959-1969	3
Eugene Churchill	1969-1972	22
John Olaf Nelson	1972-1995	-
Chris DeGabriele ^{1,2}	1995-	-
<u>Secretary</u>		
Paul Grimes	1949-1956	7
Fay V. Bos	1957-1958	2
Beryl R. Morrow	1959-1962	3
Eugene Churchill	1963-1968	5
Jim Fritz	1968-1972	4
Norma Morris	1973-1987	14
Joyce S. Reed ¹	1987-	7
<u>Auditor-Controller</u>		
Outside Consultants	1948-1960	-
Eugene Churchill	1960-1969	9
Sage Morris	1969-1987	18
David L. Bentley ¹	1987-	8
<u>Chief Engineer</u>		
Jim Fritz	1969-1989	20
William I. Wilson	1989-1991	2
Chris DeGabriele ¹	1991-1995	4

¹ Active

² Served as General Manager/Chief Engineer

North Marin Water District Retirees

	<i>Year Retired</i>	<i>Retiree</i>	<i>Years of Service</i>
1	1965	Mel Shine ¹	15.3
2	1965	Tony Hedge ¹	8.6
3	1976	Scott Riddell ¹	18.3
4	1976	Andrew Youngkin ¹	10.3
5	1978	Nick Terlizzi ¹	19.3
6	1979	Constantin Gordeef	21.0
7	1981	Phyllis Chapman ¹	23.7
8	1981	Florence House	17.3
9	1982	Victor Nougier ¹	17.3
10	1982	Carl Annis ¹	20.5
11	1984	John Giari	10.9
12	1984	Bill Melson	29.6
13	1986	Robert Pruitt ¹	12.0
14	1986	Jean Walkup ¹	9.6
15	1986	Sonja White	6.5
16	1986	Jerry Ackerman	22.6
17	1987	Williard Stanfield	15.1
18	1987	Sage Morris	18.4
19	1987	Joe Simas	38.1
20	1988	Norma Morris	24.4
21	1988	Aldo Paladini	33.5
22	1989	Jim Fritz	25.3
23	1990	Cathy Smail	17.4
24	1991	Dick Derby	26.4
25	1992	Bill Rogers	20.0
26	1992	Dick Velloza	20.2
27	1992	Pete Poiani	21.3
28	1995	John Nelson	22.4

¹ Deceased

GLOSSARY

Active connections Service connections to a water or sewer system which are actively used as opposed to connections which have been installed but are inactive (for example, a service connection to an undeveloped lot in a new subdivision).

Annexation A specific area which has been added to a given improvement district and/or the overall territory of the North Marin Water District.

Annual safe yield The production from a water conservation facility, such as a dam, which can reasonably be counted on year in and year out.

Backfeeding As used in this report, the introduction of treated water to Stafford Reservoir accomplished by pumping water from the Marin Aqueduct near Highway 101 through transmission lines connecting same to the Stafford treatment plant.

Clearwell The tank or reservoir at the end of a water treatment process into which treated water is introduced and stored awaiting transmission to the distribution system.

Coagulation and sedimentation basin An open tank in which water is introduced together with coagulation chemicals (i.e. aluminum sulfate and polymers) and is mixed together for the purpose of forming small gelatinous masses called "floc" (coagulation) and settling the floc to the bottom of the basin (sedimentation). The remaining clean water is drained (decanted) off the top of the basin.

Collection system The interconnected pipe system which collects sewerage introduced by the various customers on that system.

Dwelling unit mix The resulting mixture of various types of residential dwelling units (single family homes, apartments, townhouse units, condominium units) installed in a specified period of time.

False Positive A laboratory result indicating bacterial contamination of the distribution system immediately upstream of the sampling point when there is no such contamination. Most often caused by a faucet which is dirty or contaminated on the outside surface which material when wetted or touched drips or drops onto faucet threads and into sample. Also any faucet fitted with a filter or flow control screen device will very often yield a false positive.

Finished water turbidities The turbidity (suspended sediment primarily) remaining in water after it has gone through the entire water treatment plant. Turbidity is measured in nephelometric turbidity units or NTU's.

High service pumps The pumps that extract water from the clearwell at Stafford treatment plant and place the water in the pressurized distribution system.

Improvement district An area defined by a specific boundary within which North Marin Water District operates a water or sewer service system.

Intertie bonds Revenue bonds that were sold by the Sonoma County Water Agency to finance construction of the Russian River to Cotati Aqueduct Project.

Natural aerobic decomposition The conversion of organic material (in this case raw sewerage) to more stable compounds. The process occurs in a relatively shallow sewage pond with a large surface area exposed to air.

Offpeak water Water which is available in the North Marin Aqueduct during the winter months and which is surplus to the wintertime needs of Novato customers.

Polymers Hydrocarbon material made up of long chain molecules containing an electrical charge which when mixed with water containing suspended sediment and lime improves the efficiency of coagulation (the gathering together on suspended sediment).

Trade water deliveries Water delivered from North Marin Water District to Marin Municipal Water District, or vice verse, which is later returned in kind.

Transmission line A pipeline which conveys generally large amounts of water from one point to another.

Turbidity A measure of the amount of suspended matter in a given water sample, generally expressed as NTU's (nephelometric turbidity units).

Watershed All that area upstream and which therefore drains (is tributary) to a specific point, such as a dam.

Wheeling To wheel water means to convey water through a pipe or other hydraulic system. A wheeling charge is a charge assessed for conveying the water.

Xeriscape The conservation of water through creative landscaping. The term Xeriscape comes from the Greek work Xeros meaning dry. Xeriscapes, however, are not dry arid affairs but employ high visual impact. Thoughtful, well planned landscapes, highlighted with color from the multitude of water conserving plant materials available are the mark of a Xeriscape. Single family homes landscaped with Xeriscapes have less square-footage devoted to irrigated turf than homes landscaped more traditionally.

Zone A region or area or area set off as distinct from surrounding or adjoining parts.