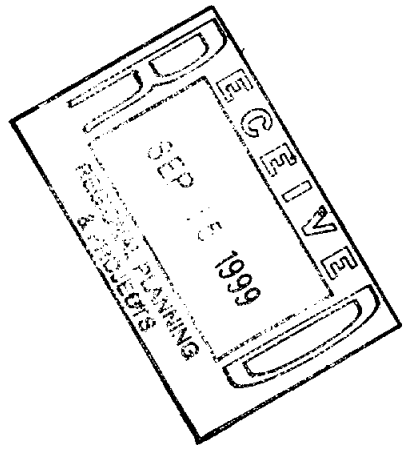
City of Raymondville

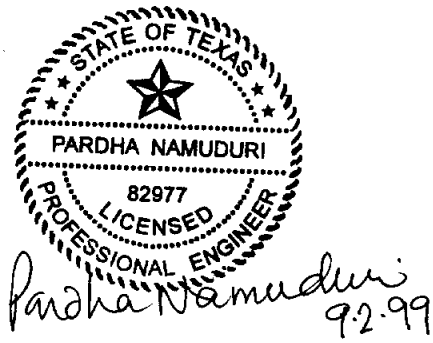
Water/Wastewater Master Plan



Funded by

Texas Water Development Board
1700 North Congress
P.O. Box 13231
Austin, Texas 78711-3231

TWDB Contract No. 98-483-248



September 1999

Submitted By

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1.0 Introduction

This Master Plan is prepared by Earth Tech (formerly Rust Environment & Infrastructure, Inc.) for the City of Raymondville pursuant to the Professional Services Agreement dated January 23, 1998. The Plan presented herein is envisioned to be a tool for the City and its citizens. It offers a comprehensive vision of the infrastructure expansions required for future development in the Greater Raymondville Region. This master plan also provides documentation of the City's projections for future land use plans, infrastructure needs and implementation plans, to encourage potential businesses to relocate to the region. The funding for this master plan was provided by the Texas Water Development Board (TWDB) under their contract with the City of Raymondville, TWDB Contract No. 98-483-248.

2.0 Land Use Projections

In the short term (five years), the city is expected to expand along Highway 186 to the west and along Highway 77 to the south. This expansion is primarily in the residential land use category. Modest expansion on the northeast is projected to be in the industrial land use category. Short-term expansion is estimated to be approximately 30 percent of the current acreage.

In the long term, the City is poised to grow in all directions, predominantly industrial and commercial land use categories in the east, and residential land use category in the west. The City's total long-term growth (30 years) in acreage is projected to increase over three-fold.

This Master Plan developed the infrastructure outlay for the above short term and long-term land use projections.

3.0 Water Supply Needs

3.1 Water Treatment

The City's water supply-needs will increase with the geographic expansion of the City limits. Water supply needs from both a quantity and reliability standpoint will increase. The City could build a new water treatment plant of 4.5-MGD capacity for the short term, with an additional expansion in the long-term future. Demolition of the existing old plant and replacement with a larger new plant, incorporating high rate filtration processes, will increase the reliability of water supply.

3.2 Distribution System

The existing distribution system is not efficient in transmission of water from the plant to the farther reaches in the south and southeast parts of the City. Constricting pipelines in the existing network currently absorb most of the available pressure head. This fact results in reduced residual pressure and flow available for regular demand on an average day, as well as for fire flows. The City could correct this deficiency by installing larger diameter (twelve-inch) diverging mains across the City for quick transport of water to the farther reaches (on the east and south), and greatly reduced

pressure loss.

The next level of expansion of the distribution system could involve installing a 16-inch backbone system to wheel water in large quantities around the City without significant pressure drop. This long-term expansion would involve installing eight to twelve-inch arterial links (as spokes of the wheel) to provide supplies to the neighborhood areas.

3.3 Water Storage and Pumping Needs

The distribution system analysis indicated that the existing network is deficient in providing sufficient fire flows. The industry standard of 2500 gallons per minute for 2 hours was used to determine storage requirements. The current storage capacity available for fire fighting is far less than desirable. A good fire fighting capability will decrease fire insurance rates, and good insurance rates attract businesses. By adding adequate backup pumps, reliable high service pumping capacity can be increased. The firm pump capacity of a system is defined as the sum total of the individual capacities, when the largest pump is out of service. The existing pump equipment is very old and frequently needs repair. A full service high lift pump station is needed as part of the new water treatment plant.

One additional elevated storage tank of 500,000 gallons capacity is needed in addition to the existing elevated storage tanks. Recommended repairs to the existing tanks should be performed as a high priority to sustain the existing elevated storage tank capacity.

4.0 Wastewater System Needs

4.1 Wastewater Treatment

The City is currently constructing a 1.5-MGD wastewater treatment plant on San Francisco Avenue that is scheduled for completion in March 1999. Based on wastewater plant flow data from the last five years -which clearly illustrates a trend of increasing flows - the new plant currently under construction will peak-out at the design capacity in 2003. Expansion of the this plant by addition of a second train could meet the wastewater treatment needs for the long term.

4.2.1 Wastewater Collection System

For the short term, collection system improvements would include repair and rehabilitation of the existing sewer pipes and lift stations, including an infiltration and inflow study. Infiltration is typically indicated by very high monthly maximum flows during wet seasons of the year. The current flow data from the wastewater treatment plant indicates that there is extensive infiltration. Regulations require that the treatment plant be designed for the maximum monthly flow. Therefore, if the collection system is upgraded to minimize infiltration and inflow, the need for the expansion of the second plant could be deferred into the future.

Recommended long-term collection system improvements consistent with anticipated future growth would include addition of about 26 miles of pipelines, 39 new lift stations, and 38 manholes.

Table 5.1

Recommended Capital Improvements Plan, Water

Description	Amount
Water Treatment Plant	$6,000,000
High Lift Pumps	Included in Water Treatment Plant
Water Storage	
Ground Level	$200,000
Elevated	$600,000
Water Distribution System Improvements (Figure 6-1)	
Existing Deficiencies	$2,100,000
Short Term Growth	$3,400,000
Intermediate Term Growth	$7,100,000
Long Term Growth	$10,600,000
Annual Water Main Upgrade	$500,000
Total	**$30,500,000**

Table 5.2

Recommended Capital Improvements Plan, Wastewater

Description	Amount
Wastewater Treatment	
Wastewater Treatment Plant (1.5mgd)	$2,250,000
Additional Sludge Drying Beds	$200,000
Collection System Improvements	
Infiltration/Inflow Study and Evaluation of Existing Collection System	$100,000
Existing Collection System Repair/ Rehabilitation	$500,000
Short Term Collection System Improvements	$1,900,000
Long Term Collection System Improvements	$5,715,000
Total	**$10,665,000**

5.0 Capital Improvement Projects

The total outlay for the short-term plan period for water and wastewater is about $17.25 million dollars. This includes part of the backbone water distribution system that is actually needed in the long term. Although short-term growth requires smaller pipe sizes, in view of the future anticipated growth in the south-southwest direction, it makes sense to install larger size mains that can later integrate into the backbone system in the long term. The schedule of the individual projects may be adjusted to suit the timing of funding availability, growth patterns, and other priorities.

For the long-term, the total capital outlay for both water and wastewater is estimated to be $23.415 million dollars over 30 years. This includes future upgrading of the water distribution and wastewater collection systems. A summary of selected capital improvement projects is listed in **Table 5.1** and **Table 5.2,** above.

6.0 Implementation Plan

The capital improvement plan envisioned for the City of Raymondville is of a significant magnitude relative to projects undertaken by the City in the past. When the City is poised to grow at the pace and to the extents projected in the plan, there will be several political and economic challenges. It is important to coordinate the needs of the actual growth with the availability of resources.

Several funding sources available for water/wastewater projects are listed in Section 8. To maximize the available funding sources, we recommend the City directly pursue grant funds, as well as pursue mutual leveraging of multiple funding sources. Alternatively, sharing of capital costs with other agencies, including North Alamo Water Supply Corporation, in return for a consistent business (privatization) can be an option. Lately, more and more municipalities throughout the country favor this option. Privatization allows for single point responsibility for the delivery of water service to the service area and spares the municipalities of the administrative and fiscal intricacies involved in the efficient running of a utility.

Although funding for all the recommended improvements noted above might seem difficult to obtain, there are numerous options available to pursue. There is an ample time period over which to locate and secure the funding. We believe that an entrepreneurial spirit and a vision of prosperity by the City leadership can make the water and wastewater system presented herein a reality.

2.0 Introduction

2.1 Acknowledgements

Earth Tech is grateful to the following persons who generously contributed to the success of the Master Planning Project:

Mr. C.M. Crowell, *Mayor, City of Raymondville*
Ms. Mary Casillas, *Commissioner, City of Raymondville*
Mr. Clifton Smith, *Commissioner, City of Raymondville*
Mr. Hector Galindo, *Commissioner, City of Raymondville*
Mr. Armando Dominguez, *Commissioner, City of Raymondville*

Mr. Eleazar Garcia, Jr., *City Manager, City of Raymondville*
Mr. Ventura Nieto, *Director of Public Works, City of Raymondville*
Mr. Roberto Cortinas, *Superintendent of Water Treatment Facilities, City of Raymondville*
Mr. Jose Moreno, *Superintendent of Wastewater Treatment Plants, City of Raymondville*
Mr. David Nieto, *Superintendent of Wastewater Collection Systems, City of Raymondville*

The Honorable Simon Salinas, *County Judge, Willacy County*

Mr. Robert Flores, *Project Manager, Texas Water Development Board*
Ms. Phyllis Lightner-Gaynor, *Funding Manager, Texas Water Development Board*

2.2 Scope of the Master Planning Study

The Master Planning Study is divided into seven major tasks. These are listed as follows:

1. Data Collection
2. Land Use Planning
3. Water Systems
4. Wastewater Systems
5. Regional Facility Plan
6. Implementation Plan
7. Water & Wastewater Plan Report

2.2.1 Data Collection

Earth Tech met with City of Raymondville and Willacy County Staffs in order to identify data sources for the Master Planning Study. Existing hard copy and software files were collected from City and County sources. Monthly water/sewer usage and billings were examined for the previous twelve-month period. Aerial photographs for the study region were obtained and evaluated. Citizen input on existing problems, needs and issues dealing with water and wastewater systems was collected in a public meeting held on February 18, 1999.

2.2.2 Land Use Planning

Earth Tech prepared existing, five-year and thirty-year Land Use Maps for the study. These maps identified extent of future water and wastewater service areas. Future water distribution and wastewater collection systems were indicated for these service areas. The City consensus was obtained in the projected land-use patterns, growth extents and water wastewater service areas.

2.2.3 Water Systems

Earth Tech updated existing City water system maps in an electronic format. Hydraulic modeling was performed and calibrated for the existing conditions. Skeletal distribution systems were mapped and modeled, respectively, for the projected five-year and thirty-year planning periods. Sequences of water system capital improvements were developed in accordance with population projections and land use patterns.

2.2.4 Wastewater Systems

Earth Tech updated existing City wastewater system maps in electronic format. Skeletal collection systems and related pumping stations were marked, respectively, for the projected five-year and thirty-year planning periods. Sequences of wastewater system capital improvements were developed in accordance with population needs and land use pattern.

2.2.5 Regional Facility Plan

Earth Tech prepared a regional water and wastewater facility plan for areas of common interest to the major players in the region, including City of Raymondville and Willacy County. Opinions of probable costs were provided for the potential projects identified in the Master Plan. Potential funding sources were identified. In coordination with the City, County and State, additional citizen input for regional topics was collected in the public meeting.

2.2.6 Implementation Plan

Earth Tech developed opinions of capital costs for water and wastewater improvements. An implementation plan for capital improvements was provided for fiscal planning in yearly increments for the first five years and in five year-increments for the 25 year long term planning period. State and Federal funding sources for capital projects were identified.

2.2.7 Water and Wastewater Plan Report

Earth Tech assembled the work of the foregoing tasks into a final report for the City and the Texas Water Development Board.

2.3 Planning Area Description

The City of Raymondville is situated in the County of Willacy in Southern Texas within the Greater Rio Grande Valley. The City is shown on the vicinity map in **Appendix A**. The City, with a population of nearly 10,000 persons, is 25 miles east of the Gulf of Mexico and 35 miles north of the United States-Mexico International Boundary. Principally, the City provides service support for regional agricultural interests of the lower Rio Grande Valley. Agricultural support includes farm workers, food packaging, farming equipment vendors, schools, light manufacturing/repair shops, and light commercial businesses. Municipal water and wastewater services are provided for a privately operated 1,100 bed, medium security prison. The City services a small, seasonal migration of northern tourists primarily during the fall and winter months. Due to the proximity to the International Border and the North American Free Trade Agreement (NAFTA) program, the City is realizing modest growth in transportation and warehousing related industries.

3.0 Population and Land Use Planning

3.1 Objective

This Section will analyze population projections presented in the "1996 Consensus Texas Water Plan" for the City of Raymondville and Hidalgo County, for the years 1990 through 2050. More information about the use of this TWDB Projection data is presented in **Appendix B**. Growth trends identified for this period will be used to project population numbers to 5-year and 30-year planning horizons established for this study, which are the years 2003 and 2028 respectively. The land use maps will be developed for design years 2003 and 2028 for the water and wastewater service areas. These projections of land use trends will be used to estimate the water supply and delivery requirements for each land use category area for the respective planning years.

3.2 Population Projections

The City population projections are developed from "population and water use guidelines" published by the Texas Water Development Board (TWDB) Water Resources Planning Division and summarized in **Table 3.1**, for the period between years 1990 and 2050.

Table 3.1
Population Projection

Year	Population (capita)
1990	8,880
2000	10,774
2010	12,081
2020	13,181
2030	13,929
2040	14,459
2050	15,009

The data of **Table 3.1** is graphically represented in **Figure 3.1**. In order to establish the analytical relationship between time and population, a best-fit natural-log equation was used to model the population projections. The resulting population trend follows the mathematical relation:

Equation 3.1
Mathematical Model for Population Projections

$$Y = 3194.7 \ln(X) + 8725.3$$

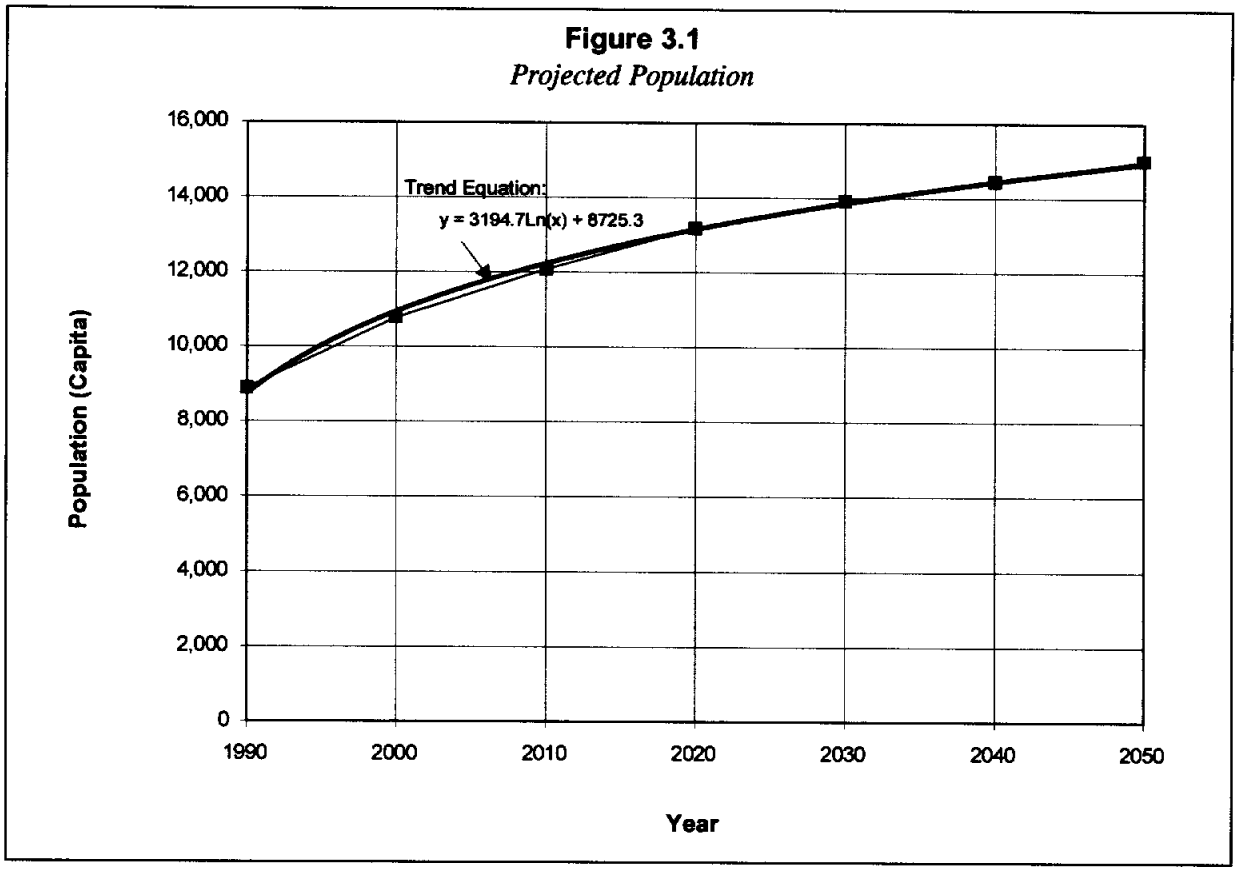
Where, Y = Population (persons), for $0 \le Y \le 18{,}000$
X = Time Value in tens of years, for $0 \le X \le 7$

The variable X represents seven equal intervals for the inclusive time periods from the year 1980 through 2050.

When X= 1.8, 2.30 and 4.8, for the years 1998, 2003 and 2028, respectively, **Equation 3.1** produces a population count of 10,603, 11,386 and 13,737 persons, respectively. These population numbers were used as the basis for water and wastewater planning.

However, a major commercial/industrial event in the Greater Raymondville Area could clearly increase population numbers significantly over the population numbers projected in **Table 3.1**. In the short term, for the five-year plan, an extraordinary growth event is not anticipated. In the long term, for the thirty-year plan, a major commercial/industrial event is probable. If the event occurs, there will be a need to reevaluate the population numbers, land use schemes and water/wastewater requirements. Since major-long term growth events are not anticipated at the current time, the population numbers projected above will be used in further analysis.

Figure 3.1
Projected Population



3.3 Future Population Distribution

Projected population increases are presented in **Figure 3.1**. The increase from the 1998 population to the five-year plan was projected to be 782 persons. The projected increase from the five-year plan to the thirty-year plan was 2,351 persons, over a period of twenty-five years.

3.4 Land Use Projection – Five Years

The five-year land use plan map appears in **Appendix C** and is referred to as **Map 1**. Primarily, the five-year plan for Design Year 2003 extends the City limits in the westerly and southerly directions. A modest northerly extension will include the existing-wastewater treatment plant site and the Colonia Los Angeles. The easterly limits will be extended for the inclusion of a small commercial area adjoining Hidalgo Avenue. The Extra Territorial Jurisdiction (ETJ) boundary, identified as "ETJ 2003", appears one mile beyond the projected 2003 City Limit boundary.

This Study has identified three land use zones. First, the Residential Zone represents low-density single family residential units that occupy land areas of 10,000 square feet to 40,000 square feet. Second, the Commercial Zone represents business and retail activities. Business activities will include professional services for the consuming public. Retail activities will include sales groups for home and agricultural usage. Third, the Industrial Zone represents light industrial activities. Light industrial activities include warehousing, transportation, manufacturing/fabrication processes, agricultural equipment and farm produce processing. The three zones are further identified with legend symbols on **Map 1** for the Design Year 2003.

3.5 Land Use Projection – Thirty Years

Map 1, included in **Appendix C**, also identifies the thirty-year Land Use Plans. The Thirty Year Land Use Plan addresses Residential, Commercial and Industrial zoning. These zones are identified specifically in the map legends for the 2028 Plan Year.

In summary, industrial expansion is expected in the northeasterly region of the City adjacent to U.S. Highway 77. Similar industrial growth will occur in the southeasterly regions, also near the highway. Commercial growth is expected to occur in a smaller region along an easterly extension of Hidalgo Avenue. A significant region of residential growth is expected along the westerly side of the City, by Year 2028. The westerly region will also experience some commercial expansion in small areas.

It is noteworthy that the City has recently commissioned the Pan American Seed Group to perform a feasibility study for future commercial/industrial development in the peripheral regions. Since the study is in the early stages, conclusive findings are not yet available. While the study is not expected to have a significant impact on the five-year plan, it should be recognized in the thirty-year plan. The feasibility study has yet to be published, hence is unavailable for the current Master Plan.

The Extra Territorial Jurisdiction (ETJ) boundary, identified as "ETJ 2028," appears one mile beyond the projected 2028 City Limit boundary, similar to the ETJ boundary in the five-year land use map.

Rancho Estates 1 and Rancho Estates 2 are unplatted Colonias about 1.5 miles west of the existing City limit boundary on the northerly side of State Highway 186 (the westerly extension of Hidalgo Avenue). The two Colonias are within Willacy County and are outside the one-mile ETJ boundary for 1998 conditions. Since significant growth is not expected to the adjoining regions of the Colonias, Year 2028 City limits have not been extended to include Rancho Estates 1 and 2.

3.6 Projections of Water Supply Needs

For the purpose of raw water demand projections, the average per capita consumption is assumed to be 150 gallons per day. This is a reasonable assumption for the overall municipal raw water demand in the valley area including wastage, and other non-residential uses. Assuming an average per capita demand of 150 gallons per day, including wastage and unaccounted water loss, water supply needs are projected for the 5-year and 30-year planning horizons. For the projected population of 11,386 persons in 2003, an average water demand of 1.75 mgd is projected. This is equivalent to 1913 acre-feet per year. For the planning year 2028, with a projected population of 13,737 persons, the average water demand is projected to be 2.1 mgd. In acre-feet per year, this is equivalent to 2352. The City has water rights for a total of 5,670 acre-feet per year from the Rio Grande River in accordance with the "Lower Rio Grande Valley Water Suit" passed in 1969. Of this amount, a net flow of 2811 acre-feet is actually received at the City's raw water storage ponds. This reduction in quantity is due to transmission and storage losses.

The City and the water purveyor responsible for the delivery of water to the City have agreed that the City will receive a firm quantity of 2811 acre-feet per year and will be billed for the cost of the remainder of its rights to cover the transmission cost.

Since the projected average raw water demand is below the available firm water supply rights, the raw water supply is not a critical issue. As the City annexes surrounding areas and expands its boundaries by converting the agricultural land to residential or industrial land use, the former agricultural water rights get freed-up and become available for acquisition by the City. However, in the case of any major industrial or commercial event occurring in the Greater Raymondville Area during the planning period, raw water supply needs should be reviewed at that time. The reliability aspect of water supply is looked into separately in Section 6 that reviews several interconnect-options with the adjoining water purveyors.

3.7 Alternate Analysis of Water Supply Needs from Land Use Projections

Acreage computations for the three land use categories were developed from the digitized maps and are summarized in **Table 3.2**. It is projected that the total acreage within City Limits will increase three-fold in 30 years. In the next five years, the increase is expected to be a modest 30 percent from the present area.

Table 3.2

Summary of Acreage of Three Land Use Categories

Land Use Category	Year 1998	Projected Increase in Acreage	
		Year 2003	Year 2028
Residential	1902	658	3855
Commercial	302	138	667
Industrial	148	232	1801
Total Acreage	2352	3380	9703
Acreage Within ETJ Boundary	8840	13175	22128

The above land use projections are used to estimate water supply needs for the planning years 2003 and 2028, as described in the following paragraphs.

It is assumed that the residential land use is based on a density of four single-family homes per acre. At an average of 3.2 persons per family, the population density is estimated to be 12.8 persons per acre for the residential land use category. Using an average per capita consumption of 150 gallons per day, the projected increase in residential water needs for the Plan Year 2003 is 1.3 mgd. The estimate of water consumption of commercial and industrial land use is more subjective since it is dependent on the type of commercial and industrial operations. From the current billing records, the commercial and industrial consumption share is about 33 percent of total water delivered. Assuming that the same percentage would prevail in the short term, the projected total water needs are projected to be 1.73 mgd for the year 2003.

The short-term projections of water needs for the plan year 2003 are more in agreement with the earlier projections (1.73 mgd and 1.75 mgd).

The City of Raymondville and Willacy County reviewed and came to consensus on the land use projections. The infrastructure needs are estimated to cater to these land-use projections. These include providing a distribution system capable of delivering sufficient fire flows to the farthest industrial service projected to be in place, long term. If the population growth occurs in line with the projected land use, the actual water demand will be as high as 10 to 13 mgd. Therefore, the water supply issue should be revisited at the end of the five-year short-term planning period. At that time, if the growth pattern is consistent with the projections of this master plan, water supply capital outlay should be increased accordingly.

4.0 Water System Evaluation

4.1 Objective

An important component of the City of Raymondville master planning process was the evaluation of the existing water system and performance of a deficiency analysis. This section reviews the inventory of existing facilities and develops the water system master plan for the years 2003 and 2028. The Water System Master Plan addresses the following topics:

1. Consumed water quantities
2. Treatment facilities
3. Distribution systems
4. Storage facilities
5. Pumping stations
6. Hydraulic model

4.2 Consumed Water Quantities

Consumed water quantities were obtained from monthly production reports. Detailed monthly production reports appear in **Appendix D. Table 4.1** summarizes monthly production records for the period from April 1997 through March 1998.

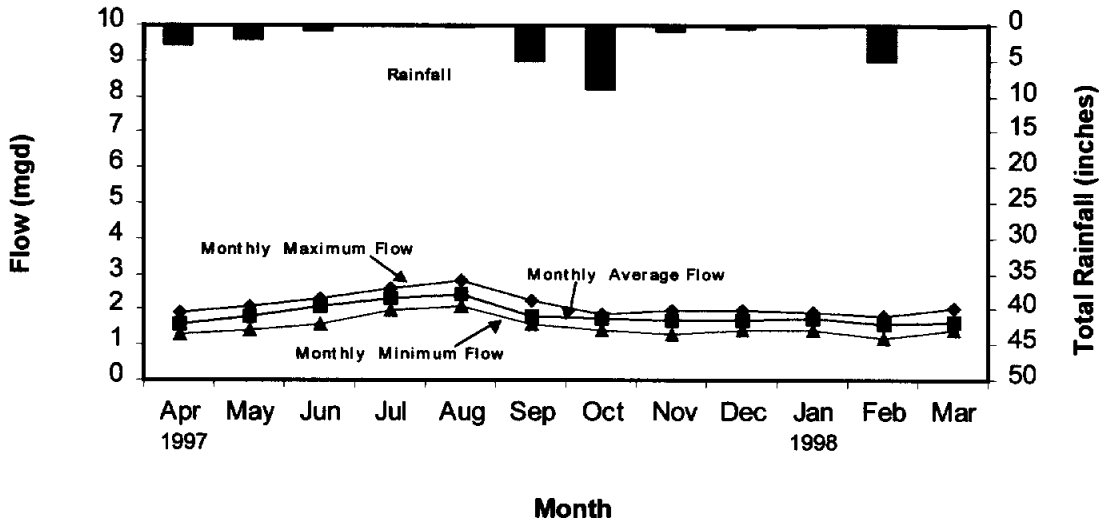
Table 4.1
Treated Water Quantities

Month	Total Monthly Quantity (m gal/month)	Average Daily Quantity (m gal/day)	Maximum Daily Quantity (m gal/day)	Minimum Daily Quantity (m gal/day)
March, 1998	51.039	1.646	2.016	1.378
February, 1998	44.658	1.594	1.818	1.168
January, 1998	54.531	1.759	1.934	1.406
December, 1997	52.792	1.702	1.952	1.415
November, 1997	50.555	1.685	1.963	1.277
October, 1997	53.169	1.715	1.868	1.393
September, 1997	53.499	1.783	2.249	1.561
August, 1997	74.101	2.390	2.819	2.055
July, 1997	70.750	2.281	2.584	1.993
June, 1997	62.020	2.067	2.283	1.589
May, 1997	54.976	1.773	2.081	1.381
April, 1997	46.652	1.555	1.938	1.317
Total	668.742			

The nature of data collection does not identify fire demand flows separately. **Figure 4.1** shows a plot of the monthly average, minimum, and maximum consumption figures of **Table 4.1**. The plot of monthly total rainfall data for the same period on the same graph indicates that the peak demand periods are also the periods of low rainfall. Most of the seasonal demand peaks can be attributed to residential lawn irrigation during hot, dry spells.

From **Table 4.1**, total water consumption per year is 668.7 million gallons.

Figure 4.1
Monthly Treated Water Flows (1997/1998)



4.3 Treatment Facilities

4.3.1 Existing Water Treatment Plant

The existing water treatment plant was constructed in 1934 and uses conventional water treatment processes including coagulation, sedimentation, sand filtration and chlorination. The existing plant evolved over the years as the demand for treated water increased, and as the City added or expanded individual unit processes. The design capacity of the existing water treatment plant is currently 2.5 mgd. It appears that several components of the plant, including weirs, concrete walls, piping and other mechanical components, are beyond repair and need replacement. It is also reported that due to breakdown of mechanical components, the cost of operating the plant is becoming more expensive. Although sedimentation facilities appear to have reserve capacity, filters allow a slow filtration rate of 2-gpm/sqft, and hence limit the plant yield. In view of the age of the existing plant and high operation and maintenance cost of several mechanical items, it is recommended that the existing plant be demolished and replaced with a new plant at a suitable site.

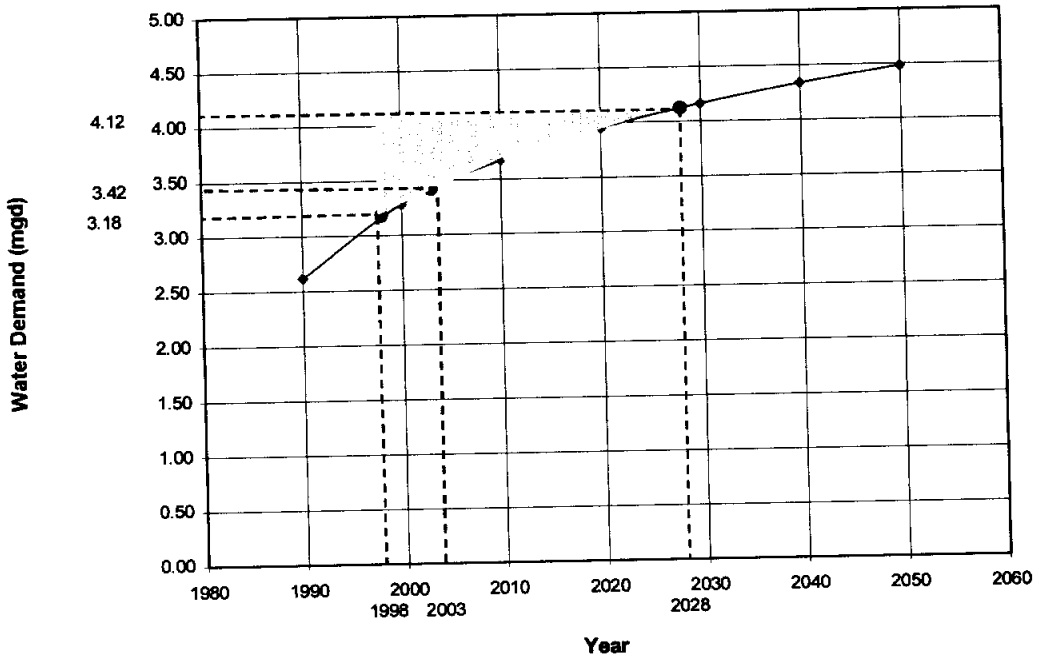
4.3.2 Treatment Plant Capacity

Figure 4.2 presents projected treated water supply needs of the City at various times during the planning period. By the Year 2003, the City will need a capacity of 3.5 mgd, and by the year 2028, the demand for treated water is projected to be 4.5 mgd. As indicated in **Figure 4.2**, in the month of August 1997, the production of the plant had already reached its maximum design capacity. Therefore, Earth Tech recommends construction of a new 4.5-mgd water treatment plant with high rate multi-media filtration immediately, and demolition of the existing plant.

Water demand projections presented in **Figure 4.2** are based on population projections provided by the Texas Water Development Board Water Resources Planning Division. The distribution infrastructure needs presented in this master plan are estimated to cater to those land-use projections. These include providing a distribution system capable of providing sufficient fire flows to the farthest industrial service projected to be in place, long term. This dual approach allows flexibility in planning so that investment in the distribution system will allow for maximum utilization of infrastructure when the actual growth takes place according to the land use plan.

If the population growth occurs in line with the projected land use, the actual water demand will be as high as 10 to 13 mgd. Therefore, the water supply issue should be revisited at the end of the five-year, short-term planning period. At that time, if the growth pattern is consistent with the projections of this master plan, water supply capital outlay should be increased accordingly.

Figure 4.2
Treated Water Demand Projections



4.4 Existing Distribution System Deficiency Analysis

Water systems are analyzed, planned, and designed primarily through the application of basic hydraulic principles. An evaluation of the City of Raymondville water system was performed to determine the adequacy of the system to supply existing and future water needs and to supply water for fire protection purposes.

The system was evaluated based on the following criteria:

1. Pressure
2. Flow capacity
3. Reliability
4. Supply
5. Storage

The water system evaluation was based on compliance with standard water industry engineering practice.

4.4.1. Water System Computer Model

A computer model was developed of the City's water distribution system. The City of Raymondville system was modeled on an IBM-compatible PC using the Cybernet pipe network program developed by Haested, Inc. The characteristics of the water system, including length and diameter of water mains, pipe roughness coefficients, ground surface elevations, and sources of supply and demand, were used as input parameters for the model.

Simulations from the Raymondville water system model were compared to flow tests. The friction coefficients (C-values) of the model were adjusted to achieve an approximate calibration. The Raymondville water system model was then used to evaluate existing water distribution system characteristics and identify deficiencies with respect to pressures and flow capacities.

4.4.2 Water System Pressures

Water system pressures will vary throughout the service area based on differences in topographic elevations, as well as supply rates and customer demands. In general, as customer demands increase, pressures will decrease. Areas higher in topographic elevations will also tend to exhibit lower water system pressures.

General requirements are that municipal water systems be designed and operated with a minimum pressure of 35 psi and a maximum pressure of 100 psi at all locations in the service area under normal operating conditions. Furthermore, under fire flow conditions, the residual pressure in the system should not fall below 20 psi at any location. Generally accepted water system pressures range between 55 and 70 psi.

Figures 4.3 through **4.5** illustrate water system pressure contours throughout the City under average day, maximum day, and peak hour demands. As indicated in the Figures, system pressures vary throughout the Utility's service area.
In no areas have the water pressures fallen below the required 35-psi under normal operating conditions. However, system pressures throughout the city are low. Normal system pressures range between 41 and 48 psi.

4.4.3 Fire Flow Capacities

Fire protection needs vary with the physical characteristics of each building to be protected. For example, a specific building may need a fire flow from as low as 500 gpm to as high as 12,000 gpm, depending on habitual classifications, separation distances between buildings, height, materials of construction, size of the building, and the presence or absence of building sprinklers. Municipal fire insurance ratings are partially based on a water utility's ability to provide needed fire flows up to 3,500 gpm. If a specific building has a needed fire flow greater than this amount, the community's fire insurance rating will be solely based on the water system's ability to provide 3,500 gpm.

Table 4.2 presents typical fire flow requirements for various land use categories. These requirements were used as a basis for evaluating the Raymondville water system. The requirements shown in this table are only intended for use as a general guideline. The actual needed fire flow for a specific building can vary considerably, as discussed above.

Table 4.2
Typical Fire Flow Requirements

Land Use	Range of Needed Fire Flows (gpm)
Single and Two-Family	
Over 100 feet building separation	500
31 to 100 feet building separation	750
11 to 30 feet building separation	1000
10 feet or less building separation	1500
Multiple Family Residential Complexes	2000 to 3000+
Average Density Commercial	1500 to 2500+
High Value Commercial	2500 to 3500+
Light Industrial	2000 to 3500
Heavy Industrial	2500 to 3500+
Other Commercial, Industrial & Public Buildings	Up to 12,000

Figures 4.6 and 4.7 illustrate the estimated available fire flow throughout the City for demand conditions of average day and maximum day, respectively, while maintaining a residual pressure of 20 psi throughout the system. From the Figures, areas of fire flow deficiencies can be identified. There are several areas in Raymondville where available fire flow deficiencies currently exist.

4.4.4 Pumping Capacity

Water supply and storage needs are closely related. The primary criteria used in determining required supply rates and storage volumes include:

- Average and peak demands,
- Operational characteristics,
- Design water demands, and
- Fire protection needs.

The following paragraphs summarize the supply and storage needs of the system.

4.4.4.1 Reliable High Lift Pumping Capacity

It is frequently necessary to take the booster pump out of service for periods of several days to several weeks for maintenance. Therefore, the *reliable* pumping capacity of a system is normally considered to be the total available delivery rate with the largest pumping unit out of service.

Table 4.3
High Lift Pumping and Storage Needs

High Lift Pumping Requirements	Current	Projected 2003	Projected 2028
Recommended Reliable Pump Capacity (gpm)	2,540	2,740	3,140
Present Reliable Pump Capacity (gpm)	2,500	2,500	2,500
Additional Capacity Required (gpm)	40	240	640
Storage Requirements	**Current**	**Projected 2003**	**Projected 2028**
Peak Hour Equalizing Requirements (gallons)	465,000	501,000	574,000
Optimum Fire Protection Needs (gallons)	450,000	450,000	630,000
Reserve Storage (gallons; 15% of Total)	161,000	167,000	212,000
Total Optimum Storage Requirements (gallons)	1,076,000	1,118,000	1,416,000
Total Effective Storage Capacity (gallons)			
Clearwell	0	0	0
City Park Tower	200,000	200,000	200,000
High School Tower	200,000	200,000	200,000
Total	400,000	400,000	400,000
Additional Capacity Required (gallons)	*676,000*	*718,000*	*1,016,000*

Notes on Table 4.3

1. Peak hour storage is storage required to meet demands which exceed the reliable supply capacity. Future peak hour equalizing storage requirements were calculated assuming the available supply is equal to the maximum day demand rate (clearwell storage equal to zero.)

2. Reserve storage is storage required to provide a start/stop range for booster pump operation and an emergency reserve storage supply.

3. Prison Tower assumed to be dedicated for Prison usage. Available storage equal to zero.

4. Fire protection needs for year 2028 anticipate an increased need for industrial protection.

5. Clearwell water storage not available due to insufficient high lift pumping capacity.

For example, under present operating conditions, the high lift pumps have a combined total capacity of approximately 4,550 gpm when operated independently, as shown in **Table 4.3**. However, the minimum reliable capacity of the pumps is approximately 2,550 gpm with the largest unit (Pump 5) out of service.

The City's reliable high lift pumping capacity should at least equal maximum day pumpage requirements, assuming adequate storage is available. If this criteria is met, adequate capacity is available to replenish storage during off-peak hours, while depletion of available storage occurs during peak demand hours. Using this criteria, and projections of future water supply requirements, **Table 4.4** summarizes the projected future water needs.

Table 4.4
Future Water Need Projections

	Current	Projected 2003	Projected 2028
Population	10,826	11,678	13,363
Per Capita Water Usage (gpcd)	169	169	169
Average Day Demand			
MGD	1.83	1.97	2.26
gpm	1,270	1,370	1,570
Maximum Day Demand			
MGD	3.66	3.95	4.52
gpm	2,540	2,740	3,140
Peak Hour Demand			
gpm	3,810	4,110	4,710

The existing reliable capacity of 2,500 gpm (3.6 MGD) is less than the current maximum day pumpage of the facility (3.66 MGD). It is projected that the deficiency in high lift pumping capacity will increase to 0.92 MGD (640 gpm) by the year 2028.

The capacity of the high lift pumps to supply water to the system is restricted by the transmission main system adjacent to the pump station. **Table 4.5** illustrates that the capacity is restricted by existing water mains to approximately 2,500 gpm.

Table 4.5
Summary of Transmission Main Capacity

Estimated Transmission Main System Supply Capacity from Pump Station

Transmission Main No.	Water Main Dia. (inches)	Allowable Headloss per 1000 ft	Estimated Capacity[1] (gpm)	Percent of Total
1	12	10	1500	60%
2	8	10	500	20%
3	8	10	500	20%
Total Transmission Main Capacity			2500	100%

Estimated System Demand

Demand Condition	Rate (gpm)	Daily Demand (MGD)	Total Capacity
Current Maximum Day	2,540	3.66	102%
Current Peak Hour	3,810	5.49	152%
Current Maximum Day + Fire	5,040	7.26	202%
Year 2028 Maximum Day	2740	3.95	110%
Year 2028 Peak Hour	3140	4.52	126%
Year 2028 Maximum Day + Fire	5240	7.55	210%

[1]Capacity based upon an internal roughness coefficient (C-value) of 90.

4.4.5 Water Storage Needs

In addition to providing water for fire protection, system storage is used as a "cushion" to equalize fluctuations in customer demands, establish and maintain water system pressures, provide operational flexibility for water supply facilities, and improve water supply reliability. The primary criteria used in this study for evaluating storage volume needs includes average and peak demands, water supply capacities, and fire protection needs.

In general, storage facilities should be adequately sized to provide sufficient quantities of water for fire protection on days of maximum customer demands. Over the planning period of this study, storage requirements for fire protection, peak hour demands and reliable supply capacities will change as the City grows and improvements are implemented.

Three primary criteria were used to develop a relationship between supply capacities and optimum

storage volumes for the City of Raymondville:

1. The reliable high lift pumping capacity should at least equal the projected maximum day pumping requirements.

2. Total available storage should be capable of meeting fire protection needs, assuming the reliable supply capacity is just adequate to meet maximum day requirements. A base fire flow of 2,500 gpm for three hours was used.

3. The reliable supply capacity, plus the available storage volume, should equal or exceed fire flow requirements plus maximum day requirements.

The City of Raymondville's pumping and storage needs are summarized in **Table 4.3**. The City's optimum water storage volume needs at the end of the planning period are 1.42 MG. This represents a shortfall of 1.02 MG by the year 2028.

4.4.6 Existing Elevated Storage Tanks

Three elevated storage tanks are interconnected with the distribution system for storage and pressure zone control. A professional inspection company inspected the three tanks in early March 1998. Complete inspection reports appear in **Appendix E.** The findings of these inspections are summarized as follows.

4.4.6.1 Prison Reservoir

The Prison Reservoir is an elevated steel storage structure located on the northerly side of the Cameron/Willacy County Prison site near U.S. Highway 77 and the easterly projection of Monroe Avenue. The reservoir has a 150,000-gallon capacity, a bottom height of 100 feet and a top height of 130 feet. The 1998 inspection reports that the interior is satisfactory. The coating system for the legs is chipping and there is minimal rust corrosion. The shell is thinning in some areas. The roof is starting to deteriorate. The ladder has lost some of the coating system and there are no safety devices.

It is recommended that the reservoir be repaired as recommended by the inspection company. Work should be completed within the next five years.

4.4.6.2 ISD Reservoir

This reservoir is an elevated steel storage structure located near the school property in the vicinity of Louisiana Avenue and Tenth Street. The circular reservoir has a 200,000-gallon capacity, a bottom height of 100 feet and a top height of 130 feet. The 1998 inspection report indicates that the interior coating system is blistering with rust corrosion. Sediment is accumulating on the floor. The legs, with almost no paint, are incurring some rust and chipping. Struts, sway rods and needle rods are seriously rusted at the top. Several leaks and rust areas were observed in the riser. The roof manway and vents are rusted. The catwalk, with handrail separation, is thinning and pooling. The

exterior ladder is rusting and is not fitted with safety devices. Bolts are rusting in the interior ladder. The riser should be fitted with a larger hatch. The roof manway should be enlarged.

It is recommended that the reservoir should be repaired, as a high priority, and the work should be completed within the next two years.

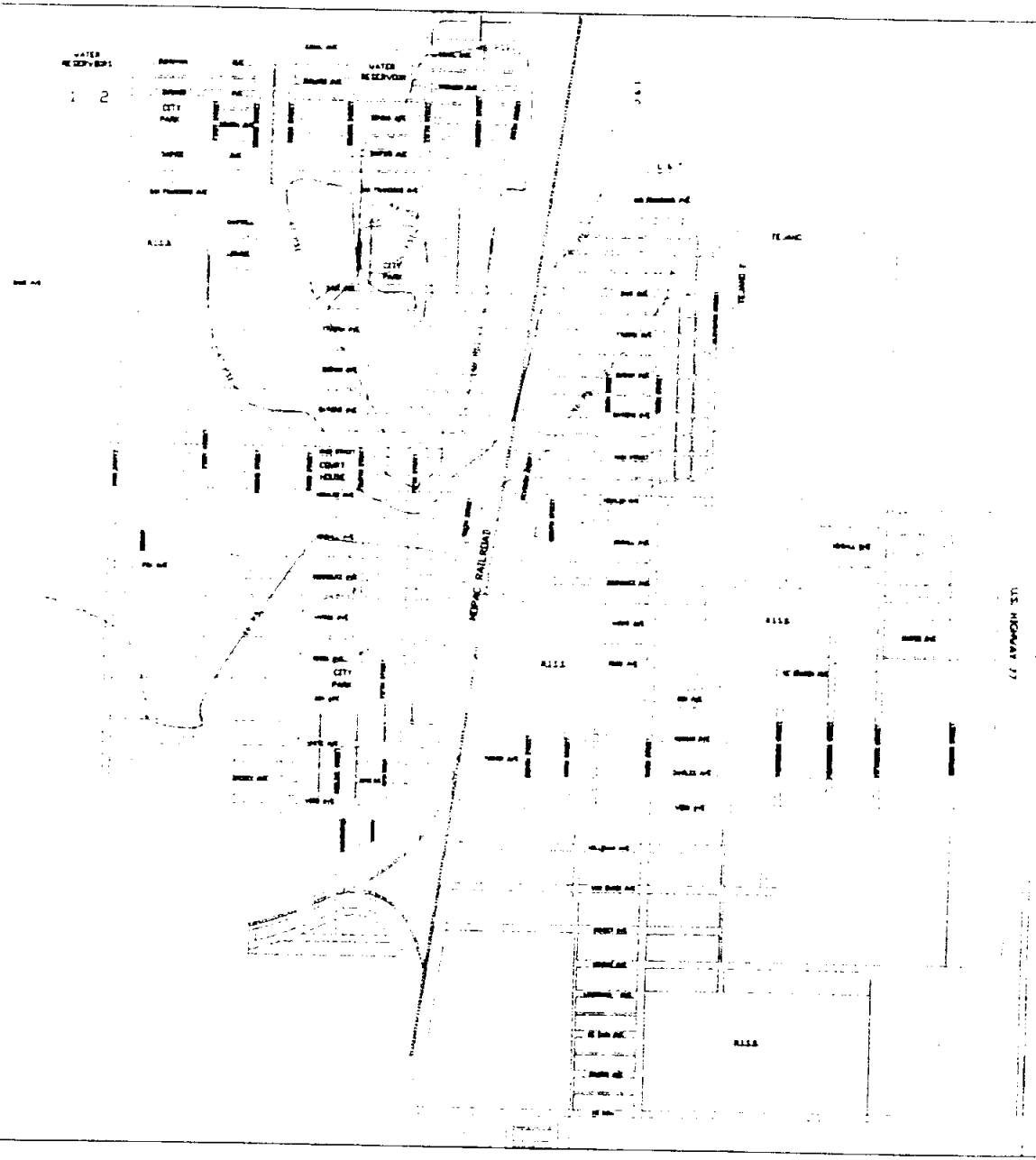
4.4.6.2 City Park Reservoir

City Park Reservoir is an elevated steel storage structure located in the City Park at Gem Avenue and First Street. The spherical reservoir has a 200,000-gallon capacity, a bottom height of 100 feet and a top height of 130 feet. The 1998 inspection reports that the interior is satisfactory. The coating system for the legs is chipping and there is minimal rust corrosion. The shell is thinning in some areas. The roof is starting to deteriorate. The ladder has lost some of the coating system and there are no safety devices.

It is recommended that the reservoir repairs should be completed within the next five years.

4.4.7 Summary

This chapter summarized the findings from the evaluation of the City of Raymondville water distribution system. Pressures throughout the distribution system are low, ranging from approximately 41 psi to 48 psi under normal operating conditions. Although static pressures are low, the system is able to maintain pressure above a minimum standard of 35 psi under high demand conditions. During emergency demand conditions, the system is susceptible to high head losses, restricting flow carrying capacity and reducing fire protection ability. Even under average day demand conditions, a fire protection demand of 2,500 gpm cannot be met throughout much of the system. Projecting to the end of the planning period, the water facilities have inadequate reliable high lift pumping capacity to meet anticipated future maximum day demands. The facilities also have inadequate water storage capacity to meet the projected system demands.



0 500' 1000'
SCALE

CONDITIONS
1 AVERAGE DAY DEMAND (1.83 MGD)
2 TOWER HYDRAULIC GRADE LINE = 130
3 BOOSTER PUMPS 3 & 4 OPERATING
4 MAINS 6" AND LARGER
5 ALL VALVES OPEN

LEGEND

35 PSI
36 - 40 PSI
41 - 45 PSI
240 PSI

FIGURE 4-3
PRESSURE CONTOUR MAP
AVERAGE DAY DEMAND
CITY OF RAYMONDVILLE
RAYMONDVILLE, TEXAS
1/99 32526

EARTH TECH
A TYCO INTERNATIONAL LTD. COMPANY

0' 500' 1000'
SCALE

CONDITIONS:
1. MAXIMUM DAY DEMAND (3.66 MGD)
2. TOWER HYDRAULIC GRADE LINE = 130'
3. BOOSTER PUMPS 2, 3, & 4 OPERATING
4. MAINS 6" AND LARGER
5. ALL VALVES OPEN

LEGEND

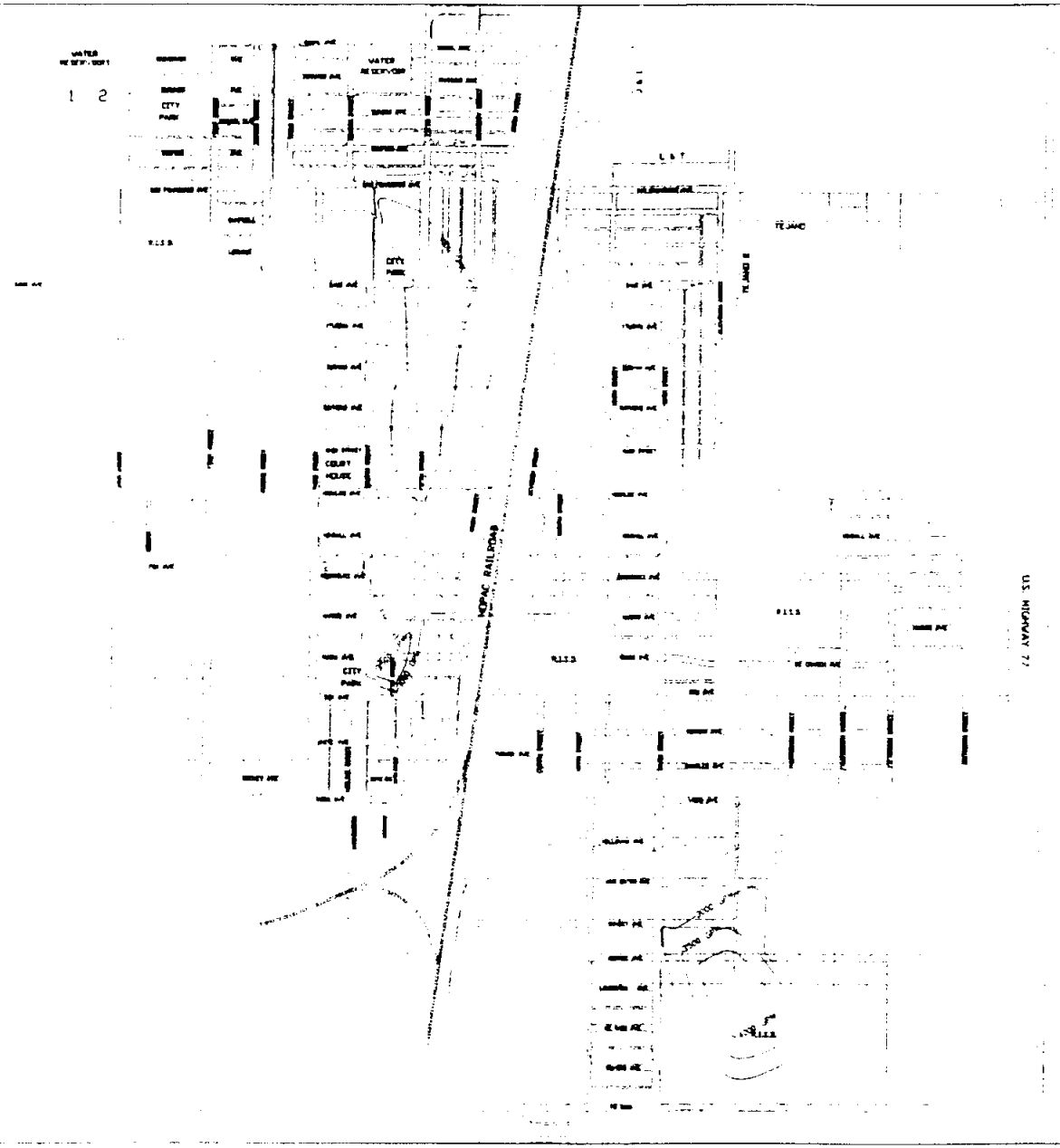
≤35 PSI
36 - 40 PSI
41 - 45 PSI
>46 PSI

FIGURE 4-1
PRESSURE CONTOUR MAP
MAXIMUM DAY DEMAND
CITY OF RAYMONDVILLE
RAYMONDVILLE, TEXAS
1, 99 32526

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

FIGURE 4-5
PRESSURE CONTOUR MAP
PEAK HOUR DEMAND
CITY OF RAYMONDVILLE
RAYMONDVILLE, TEXAS
1/99 32526

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY



0' 500' 1000'
SCALE

CONDITIONS:
1. AVERAGE DAY DEMAND (1.83 MGD)
2. TOWER HYDRAULIC GRADE LINE: 130'
3. BOOSTER PUMPS 1, 2, 3, & 4 OPERATING
4. MAINS 6" AND LARGER
5. ALL VALVES OPEN
6. MINIMUM SYSTEM PRESSURE 20 PSI

LEGEND

- ≤ 500 GPM
- > 500 – ≤ 1500 GPM
- > 1500 – ≤ 2500 GPM
- > 2500 GPM

FIGURE 4-6
FIREFLOW CONTOUR MAP
AVERAGE DAY DEMAND
CITY OF RAYMONDVILLE
RAYMONDVILLE, TEXAS
1/99
32526

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

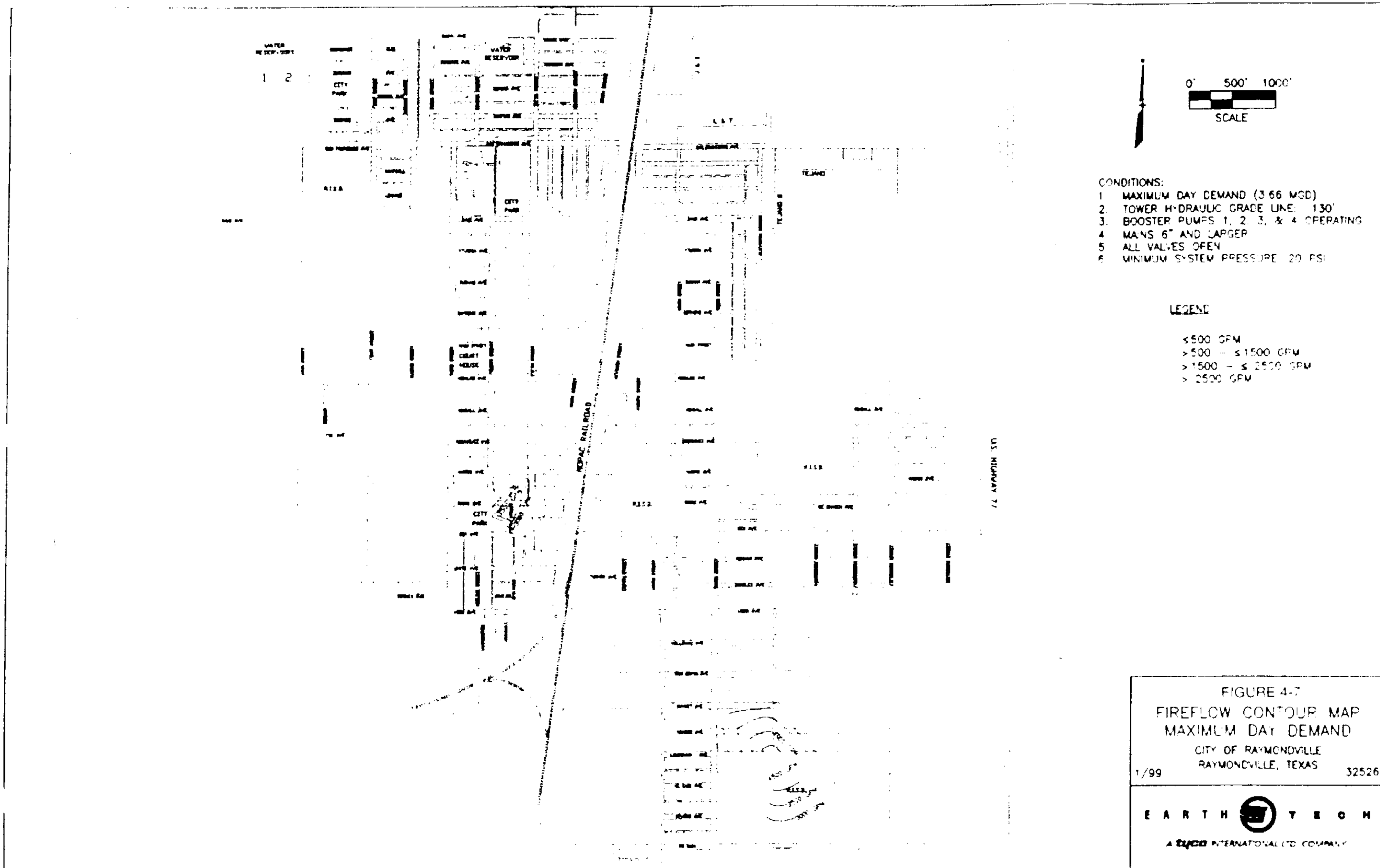


FIGURE 4-7
FIREFLOW CONTOUR MAP
MAXIMUM DAY DEMAND
CITY OF RAYMONDVILLE
RAYMONDVILLE, TEXAS
1/99 32526

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

5.0 Wastewater System Evaluation

5.1 Scope of Section

This Section provides an inventory of 1998 wastewater conveyance and treatment facilities and evaluates the wastewater system needs for the years 2003 and 2028. The Wastewater System Evaluation addresses the following topics:

- Recommendations for future investigation
- Wastewater flow projections
- Treatment facilities
- Collection system
- Capital Improvement Projects

5.2 Future Investigations

The existing sewer system in the City limits is several decades old. Several reaches of the main collection pipes are made of clay, with concrete joints. It was reported that the joints are in bad condition, causing extensive infiltration. Video logging through main sewer trunks would be very helpful in revealing the condition of the pipes. A listing of all pipe segments categorized according to their repair condition would be very helpful in estimating the cost of repairs.

It is recommended that an inflow and infiltration study be conducted on the existing wastewater collection system for greater accuracy in predicting hydraulic quantities. It is also recommended, as part of this study, that an investigation be performed of the condition of the existing sewer system, manholes, and lift stations.

5.3 Wastewater Flow Projections

Future wastewater flows are projected from the past flow records for the existing plant. Wastewater quantities and characteristics were obtained from the annual plant records, representing four years of operation from 1993 to 1997. The original records, together with the rate of flow summary, appear in **Appendix H**. Based on the plant operational data, Monthly Average, Monthly Maximum and Monthly Minimum flows are shown in **Figure 5.1**. Additionally, **Figure 5.1** also shows a trend line for each group of data points. This trend line is analytically represented as a straight line with the **Equations 5.1 and 5.2** in X and Y. The X axis in these graphs represents months and the Y axis represents MGD. The data for 59 months between 1993 and 1997 provides the following trend equations.

Equation 5.1
Average Wastewater Flow Trend

$$Y=0.0049*X + 0.6083 \text{ for } 1 \geq X \geq 59$$

Equation 5.2
Maximum Wastewater Flow Trend

$Y = 0.0060*X + 0.7655$ for $1 \geq X \geq 59$

Equation 5.3
Minimum Wastewater Flow Trend

$Y = 0.0025*X + 0.4801$ for $1 \geq X \geq 59$

Figure 5.1
Wastewater Effluent Flows

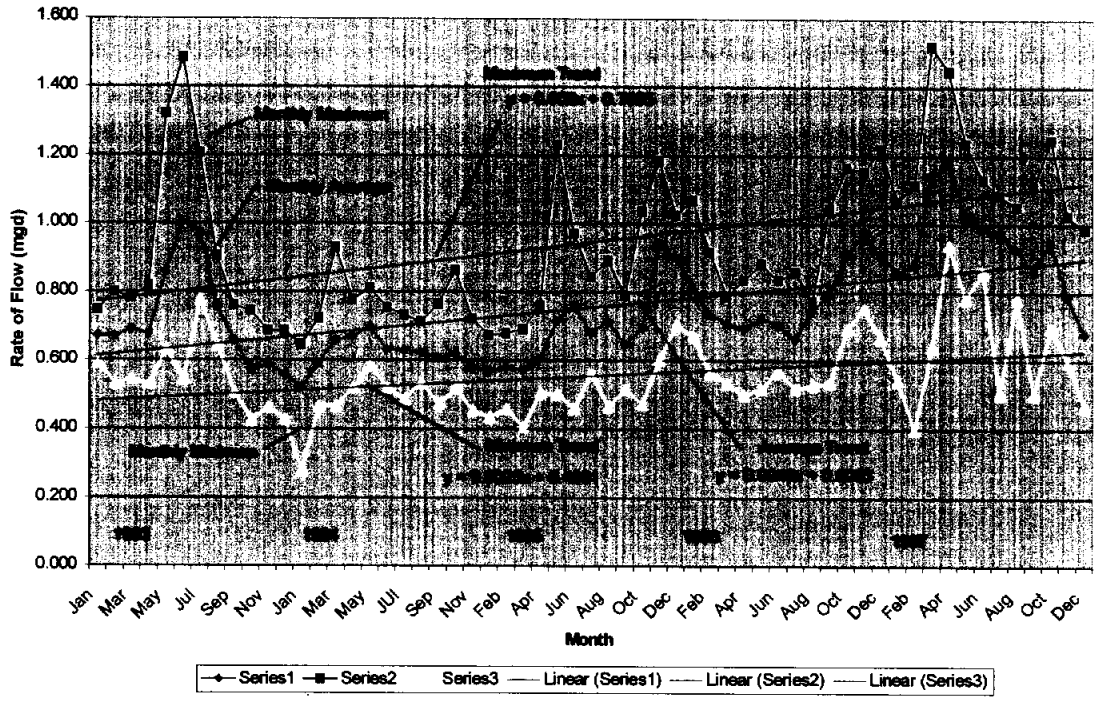


Figure 5.1 shows a 50% increase in the average flow from 0.60 MGD to 0.90 MGD, from 1993 to 1997. Similarly, the maximum flow has increased 60% and the minimum flow has increased 25%, during the same five-year period.

Monthly peak flows and monthly average flows are related by a constant known as *maximum monthly flow peaking factor*. Maximum monthly flow peaking factor is the ratio of maximum monthly flow divided by the monthly average flow. On the basis of these flow trends, the ratio between monthly maximum flow **(Equation 5.2)** and the monthly average flow **(Equation 5.1)**

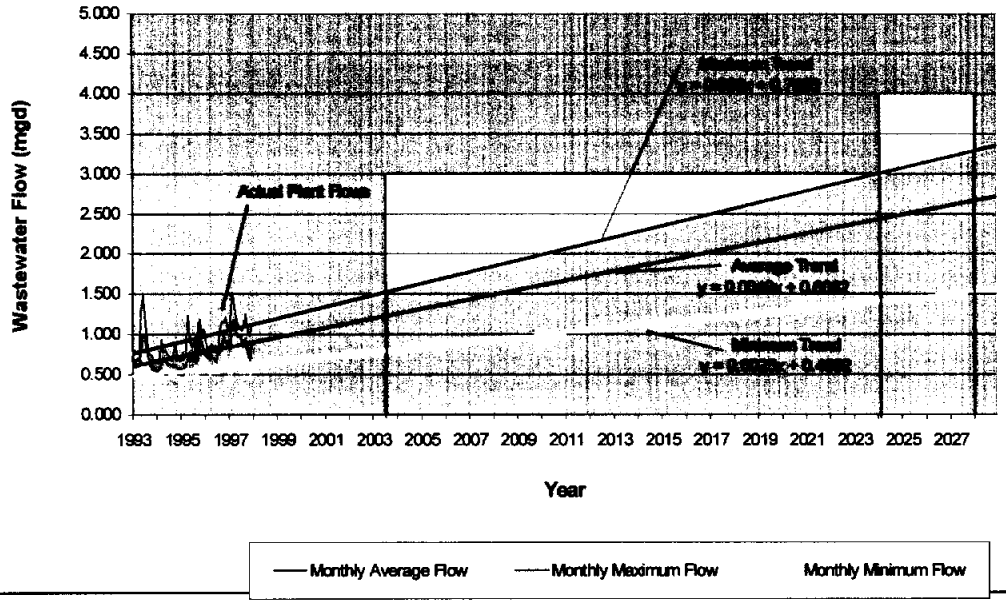
indicates a monthly peaking factor of 1.25. This fact is also illustrated in **Figure 5.1**. Wastewater treatment plants are designed and permitted for maximum monthly flows calculated from the historic wastewater flows within the service area.

Daily maximum peaking factor is defined as the ratio of the highest daily flow to the monthly average flow through the plant. According to the American Society of Civil Engineers, daily peaking factors are usually expected to be around 3.0 for a population of 10,000 persons. Hourly peaking factors will exceed the daily peaking factors, frequently in significant magnitudes, depending on the condition of the collection system, ground water and storm runoff. Hourly peaking factors are used to check the plant hydraulics to ensure that the plant components are adequately designed to prevent overflowing under hourly peak flow conditions.

The future wastewater flows for the City of Raymondville service area are estimated by extending the trend lines into the short-term and long-term planning years. **Figure 5.2** illustrates the average, maximum, and minimum flows for the years 1998, 2003 and 2028 respectively. By the year 2003, the maximum monthly flow in the service area will reach 1.5 MGD. In other words, the wastewater treatment plant currently under construction will operate at its design capacity by the year 2003. If the increase in wastewater flows follows the projected trend, by the year 2024, the City will be experiencing maximum monthly flows of approximately 3.0 MGD. TNRCC regulations on planning and design of wastewater treatment works mandate commencing of planning work by the time the actual flows reach 75% of the design capacity and completion of construction by the time the flows reach 90% of the design capacity. This rule is often referred to as "75-90 Rule".

Figure 5.2

Average, Maximum and Minimum Flows for 1998, 2003, and 2028



The planning work for the next expansion of the new wastewater treatment plant should start immediately as the current flows are already at the 75% of the design capacity (1.5 MGD) of the plant currently under construction.

5.4 Treatment Facilities

The City currently owns an activated sludge wastewater treatment plant on San Francisco Avenue near US Highway 77 in northern part of the City. This plant has a design capacity of 1.0 MGD and has been in operation for several years. In the recent years the plant performance has been unreliable and in some instances has violated the permit requirements.

The City obtained grants from a federal program (FHA) to fund construction of a new wastewater treatment plant. The new plant is under construction at the old plant site and is designed for 1.5-MGD design capacity using extended air oxidation ditch process. The construction completion is scheduled for the end of March 1999. Once the new plant is operational, some of the process units in the old plant such as aeration basin and digesters can be rehabilitated and used for interim sludge processing.

As discussed in **Section 5.3**, the maximum monthly flows will increase to 3.0 MGD by the year 2024 and 3.5 MGD by the year 2028. The plant site on San Francisco Avenue, where the new plant is currently under construction, has room for addition of an additional treatment module of 1.5 MGD. It is recommended that the planning work for the second module be started immediately. With the construction of the second module, the City will meet its wastewater treatment needs till the year 2024. The aeration basin and aerobic digester of the existing old plant will be rehabilitated to function as aerobic digesters for the new plant under construction. This aerobic digestion capacity may be adequate for processing of the sludge from the combined 3.0-MGD plant. However, additional sludge drying beds may be necessary to process digested sludge from the second plant. For the years beyond 2024, it is recommended that the additional wastewater treatment plants and sludge processing facilities be located at an alternate site.

5.5 Collection System

As stated in **Section 3**, the increase in acreage of expansion of the City in short term and long term planning horizons is 3380 and 9703 acres, respectively, from the current area of 2352 acres. In other words, the magnitude of growth will result in two- and five-fold increase in the mere geographic size of the City. The following discussion of wastewater infrastructure needs and capital improvements is presented from this perspective.

The existing wastewater collection system for Year 1998 is represented by **Map 3-B** appearing in **Appendix I** of this Report. Projected wastewater collection systems, representing Years 2003 and 2028, are represented by Map **3-A** in **Appendix J.** The maps indicate locations of lift stations, force mains, and man holes.

Sanitary sewers and force mains six inches and larger are shown in the maps. A summary of the sewer line sizes and pipe lengths is presented in **Table 5.1** for the planning years 2003 and 2028.

House laterals and subdivision collectors are not included. The design of collection system is based on the following assumptions.

1. All collection system pipelines are made of PVC.
2. Minimum gravity line size is 8-inches diameter.
3. Minimum force main size is 6 inches.
4. A manhole is located at every 500 feet along all gravity mains.
5. All force mains from lift stations discharge freely into another lift station or a manhole.
6. Lift stations are provided to limit the maximum depth of wet well to no more than 20 feet.
7. Minimum operating cycle time for lift stations is 6 minutes.
8. No surcharge (backing up of water level into gravity main) is allowed into any gravity lines feeding into the lift station.
9. Duplex submersible pumps in circular concrete caissons are recommended for economy and ease of maintenance.

Due to the flat terrain, it is economical to convey wastewater through short gravity runs and several wastewater lift stations, thereby limiting the depth of gravity mains and lift stations. The current collection system includes twenty lift stations. By the year 2003, the City needs an additional eight lift stations. For the long term, a total of 31 additional lift stations are needed to convey the wastewater generated within the service area to the treatment facility. Reliable operation and control of a large collection system, similar to the size of the proposed Raymondville wastewater collection system, would be feasible only through total automation of the control system. Although the current lift station operation is automated, based on sensors in the wet wells, it does not provide remote monitoring of the status of equipment and flows. Therefore, a Supervisory Control and Data Acquisition (SCADA) system is recommended for the monitoring of all the lift stations from a central control room. This capital improvement is recommended for the long term planning period.

Table 5.1
Summary of Additional Pipe Lengths
Future Wastewater Collection System

Item Description	Quantity (number or linear feet) Year 2003	Year 2028
Lift Stations*	8	31
Manholes	6	32
18-inch PVC	-	1300
16-inch PVC	9650	1250
12-inch PVC	13200	8400
10-inch PVC	1800	24950
8-inch PVC	3550	34250
6-inch PVC	2200	34700
Total	30400	104850

* There are 20 lift stations operating within the present wastewater collection in 1998.

Twenty pumping stations currently in service in the City limits are shown in Map **3-B** of **Appendix I.** Lift station characteristics are summarized in **Appendix L.** Interviews with City Operations and

Maintenance Staff revealed that the general conditions and performance of the lift stations are in good health. Some of the existing lift stations are located in high traffic areas and are difficult to maintain. The following improvements are recommended for the existing lift stations and manholes.

1. Lift station no. 3 currently operates with a single pump. A standby pump should be provided with automatic switchover in case of lead pump failure.

2. Engineering study is required to evaluate elimination of old pump stations in high traffic areas and for diversion of flow to an adjacent lift station or a new lift station. This task can be combined with the infiltration study recommended in **Section 5.3**.

3. Visual inspection of some of the manhole structures revealed that the rim concrete and cast iron covers are damaged causing infiltration. A detailed visual survey and a repair program are recommended to limit infiltration and eliminate hazards due to damaged manhole covers.

6.0 Recommended Water & Wastewater System Improvements

6.1 Water System Improvements

The Raymondville water system will require improvements to accommodate the future service area needs and address existing system deficiencies. This section summarizes recommended water system improvements. The following topics are discussed:

- New Water Treatment Plant
- SWDA D/DB Rules
- Water Supply Improvements
- Water Storage Improvements
- High Lift Pumping Station Improvements
- Distribution System Improvements and Expansion

6.1.1 Water Supply and Storage Improvements

This section reviews recommendations to increase water supply capacity, and addresses current and future deficiencies in distribution pumping and storage capacity.

6.1.1.1 New Water Treatment Plant

An analysis of treated water demand projections is presented in **Section 4**. A discussion of the existing plant is also presented in **Section 4**. Based on the result of this analysis, it is concluded that the City needs a total treated water supply of 3.5 MGD by the year 2003, and a total treated water supply of 4.5 MGD to serve the projected growth up to the planning year 2028. The existing plant currently produces a flow of 2.5 MGD. Discussions with the City staff and visual observations indicated that the existing plant is very old and frequently needs repair. Expansion of the existing plant to meet future demands at a reasonable cost is not feasible. It is recommended that the existing plant be demolished and replaced with a new water treatment plant employing multi-media high-rate filtration.

Conventional treatment involving coagulation, sedimentation, filtration and disinfection may be considered for the new treatment plant. Present raw water storage ponds need to be modified to feed settled raw water to the new plant.

6.1.1.2 Safe Drinking Water Act/Disinfection/Disinfection Byproduct (D/DBP) Rules

The new Safe Drinking Water Act amendments and Disinfection/Disinfection By-Products Rule of 1998 require the following:

1. Each individual filter must have a turbidity meter.
2. The combined filter effluent turbidity should not exceed 0.3 NTU.

If disinfection byproducts are excessive, the new plant may require chloramination to limit formation of disinfection byproducts. Chloramination forms minimum disinfection byproducts, and therefore, is favored over chlorination. However, chloramination will require much longer disinfection contact times relative to chlorination.

The design of the new treatment plant should consider the above issues and the most suitable overall treatment processes should be adopted.

6.1.1.3 Water Storage

The deficiency analysis identified the need to provide an additional 1.0 MG of water storage. This storage can either be provided as elevated or ground level storage or as a combination of both. For the purpose of this planning study it has been assumed that 500,000 gallons of elevated and 500,000 gallons of ground level storage at the new water treatment plant will be provided.

6.1.1.4 High Lift Pumping Capacity

With the construction of the new water treatment plant, a minimum reliable high pumping capacity of 4.52 MGD should be provided. Therefore, total pumping capacity should be in the range of 6.0 MGD. Exact sizing of high lift pumps will be performed during plant design.

6.1.1.5 Distribution System Improvements and System Master Plan

Figure 6.1 is a composite illustration of recommended water distribution system improvements and system expansion. This figure also represents the proposed Year 2028 Master Plan.

All major transmission mains identified in **Figure 6.1** have been sized to meet projected future water system demands. System supply sources and storage facilities needed to serve outlying area land uses are also identified. Mains were sized to provide at least 2,500 GPM of flow capacity in industrial areas. The mains shown in **Figure 6.1** are only the large transmission mains. Smaller local service mains have not been shown. The transmission mains shown follow known or presumed locations for major streets in the Year 2028 urban service area. Adjustments in the actual location of these mains can be expected at the time the mains are required or as local needs dictate.

Water mains to serve developing residential land should be sized at a minimum of 8 inches in diameter. These mains should provide a minimum of 1,000 GPM at a 20-psi residual pressure in single-family areas. Fire flows of 2,500 GPM should be used as the criteria for multi-family developments.

This water system master plan for the City of Raymondville has been developed as a tool to guide the City in the siting and sizing of future system improvements. While the plan may represent the current planned expansion of the water system, future changes in land use, water demands or customer characteristics could substantially alter the implementation of the master plan. For this reason, it is recommended that the master plan be periodically reviewed and updated using City planning information to reflect the most current projections for City of Raymondville area growth

and development.

The master plan is a guidance document that details existing conditions and recommendations for the future. The plan is based on the system and future conditions as perceived in 1998. As time progresses, additional information will become available and events will shape the development of the Raymondville area. The master plan must be dynamic in response; it should be studied and used but also adjusted to conform with the changes and knowledge that will come with time. Updates should be made on a regular basis, every five years at the minimum.

6.2 Recommended Capital Improvements Plan - Water

This chapter summarizes the recommended water system improvements and the recommended capital improvement plan. The Capital Improvements Plan prioritizes improvements and provides a proposed schedule for the timing of construction. Budget-cost estimates for each improvement are also summarized.

6.2.1 Water Supply

Current water rights owned by the City of Raymondville ensure a maximum supply of 2811 acre-feet per year at the raw water reservoir. This supply is sufficient to meet the raw water needs beyond the year 2028. This supply is occasionally interrupted for short periods during times of very high demand. These unplanned interruptions expose the City of Raymondville to the risk of loss of supply during summer months when the demand is the highest.

North Alamo Water Supply Corporation is a privately owned water supply corporation operating in the Rio-Grande Valley, with a service area covering Willacy, Cameron and Hidalgo counties. The Company owns and operates six water treatment plants, seven booster stations and several water towers and supply mains. The City of Raymondville can benefit by tying into the North Alamo Water Supply Corporation system to improve its water supply reliability.

An 8-inch water line owned by North Alamo WSC runs along FM 1762 up to the Raymondville ETJ limits on the northwest. At the ETJ boundary, the line turns north to connect with the elevated storage tank about a mile north of the City. An alternate location to interconnect is on Highway 186 at Spence Road (FM 1834). This location is more favorable since the proposed water system improvements for the short term recommend an 8-inch loop to service the residential growth along Highway 186. This loop can also serve as the emergency-interconnect to the North Alamo system. North Alamo pipeline operates at about 55 psi in the Raymondville vicinity. Therefore, it is feasible to tie-in directly without the need for additional booster pumps.

Another potential emergency tie-in, to serve the eastern part of Raymondville, is to connect with the Delta Lake Irrigation District distribution line. Economic and technical feasibility of this project needs further investigation.

Situated three miles south of Raymondville, Lyford is a small town that services its water customers with its own water. Mutual cooperation agreements between Lyford and Raymondville can benefit

both the communities in improving the reliability of water supply.

6.2.2 Water Storage

It is recommended that water storage of 500,000 gallons be provided at the water treatment plant. This storage should be in addition to storage for treatment plant operations, such as storage required for chlorine contact time and high lift pump operation. In addition, it is recommended the City construct a new 500,000 gallon elevated tank.

6.2.3 Distribution

Recommended distribution system improvements and expansion are illustrated in **Figure 6.1.** The improvements have been recommended to strengthen and expand the existing transmission main network and the support system.

Table 6.1 presents the recommended capital improvements that should be implemented in the foreseeable future, and provides a summary of budget cost estimates.

Table 6.1
Recommended Capital Improvements Plan, Water

Description	Amount
Water Treatment Plant	$6,000,000
High Lift Pumps	Included in Water Treatment Plant
Water Storage	
Ground Level	$200,000
Elevated	$600,000
Water Distribution System Improvements (Figure 6-1)	
Existing Deficiencies	$2,100,000
Short Term Growth	$3,400,000
Intermediate Term Growth	$7,100,000
Long Term Growth	$10,600,000
Annual Water Main Upgrade	$500,000
Total	**$30,500,000**

The proposed capital improvements plan has been formulated based on all of the information presented in this study. All of the improvements listed have been developed and prioritized based on deficiencies identified in the existing water system, and the needs of the City of Raymondville's

future service area.

The actual construction cost for recommended improvements may vary from the costs outlined in this report, depending on the year facilities are constructed, the rate of increase in future construction costs, and unforeseen conditions which could be encountered during the design of the improvements.

In establishing priorities for these improvements, it will be necessary to take into consideration the availability of financial resources and local City needs to assure that the recommended improvements are implemented in an orderly, coordinated and economical fashion.

6.3 Wastewater System Improvements

An analysis of the City of Raymondville wastewater system is presented and future improvements to meet the projected growth are identified in **Section 5**. This section summarizes recommended wastewater system improvements and associated capital costs. The estimated cost opinions are presented for short term and long term planning years -- 2003 and 2028, respectively. The following topics are included in the respective capital improvement plans.

- Future Investigations
- New Wastewater Treatment Plant
- Wastewater Collection System Improvements
- Wastewater Lift Stations
- Improvements to Existing Collection System

6.3.1 Future Investigations

An infiltration and inflow study is recommended for the existing wastewater collection system. The objectives of this study are to:

1. Determine and categorize the extent of repairs to the existing sewer pipes by a combination of video logging and visual inspection/ pot-holing;
2. Determine and categorize the extent of repair/ replacement of man holes;
3. Infiltration and inflow analysis and identification of possible flooding areas; and
4. Evaluate existing lift stations and develop repair/ replacement recommendations including demolition/ alternative routing of flows from existing lift stations in high traffic locations.

6.3.2 New Wastewater Treatment Plant

The wastewater treatment plant currently under construction was designed for a maximum monthly average flow of 1.5 mgd. According to the wastewater projections presented in **Section 5**, this plant is likely to be operating at its design capacity by the year 2003. The plant site on San Francisco Avenue, where the new plant is currently under construction, has room for addition of a second extended aeration treatment module of 1.5 mgd. Planning and design of this second module should

be started immediately. Addition of the second module is expected to cater the wastewater treatment needs until the year 2024. The aeration basin and the re-aeration basin in the old plant should be converted into one combined aerobic digester. This aerobic digestion capacity may be adequate for the combined 3.0-mgd treatment plant. Additional sludge drying beds may be necessary for the second module expansion. The cost of additional sludge-drying beds is included in the long term planning period.

6.3.3 Collection System Expansion

Projected wastewater collection system for the short term and long term planning years is presented in **Map 3A** included in **Appendix J.** Tables listing lift stations, force mains, gravity sewers, manholes are also included in **Appendix J**. In summary, a total of 30,500 linear feet of sewer lines, 8 new lift stations, and 6 new manholes are planned for the short term. The short-term expansion is projected to occur mainly in the southern and western parts of the City. Over the long-term, a total of 104,850 linear feet of sewer lines, 31 new lift stations, and 32 manholes will be needed. Although the costs of short term sewer lengths, lift stations, and manholes are accounted for in the 2003 plan year, these components are so sized to be integrated into the long term expansion. The total cost of short term and long-term wastewater collection system needs is estimated to be $7,600,000 in 1998 dollars. This cost does not include right-of-way acquisition and other legal and administrative fees.

6.3.4 Improvements to Existing Collection System

Selective repair and rehabilitation of the existing collection system is recommended to extend the life of existing lift stations, manholes, and sewer lines. As a priority, the lift station currently operating with no standby pump should be installed with a standby pump. A detailed evaluation of the condition of all the existing lift stations and manholes is needed to determine the need for selective replacement of old and damaged pump stations. A program to repair and rehabilitate the manholes should be developed to extend the life of existing collection system.

Table 6.2

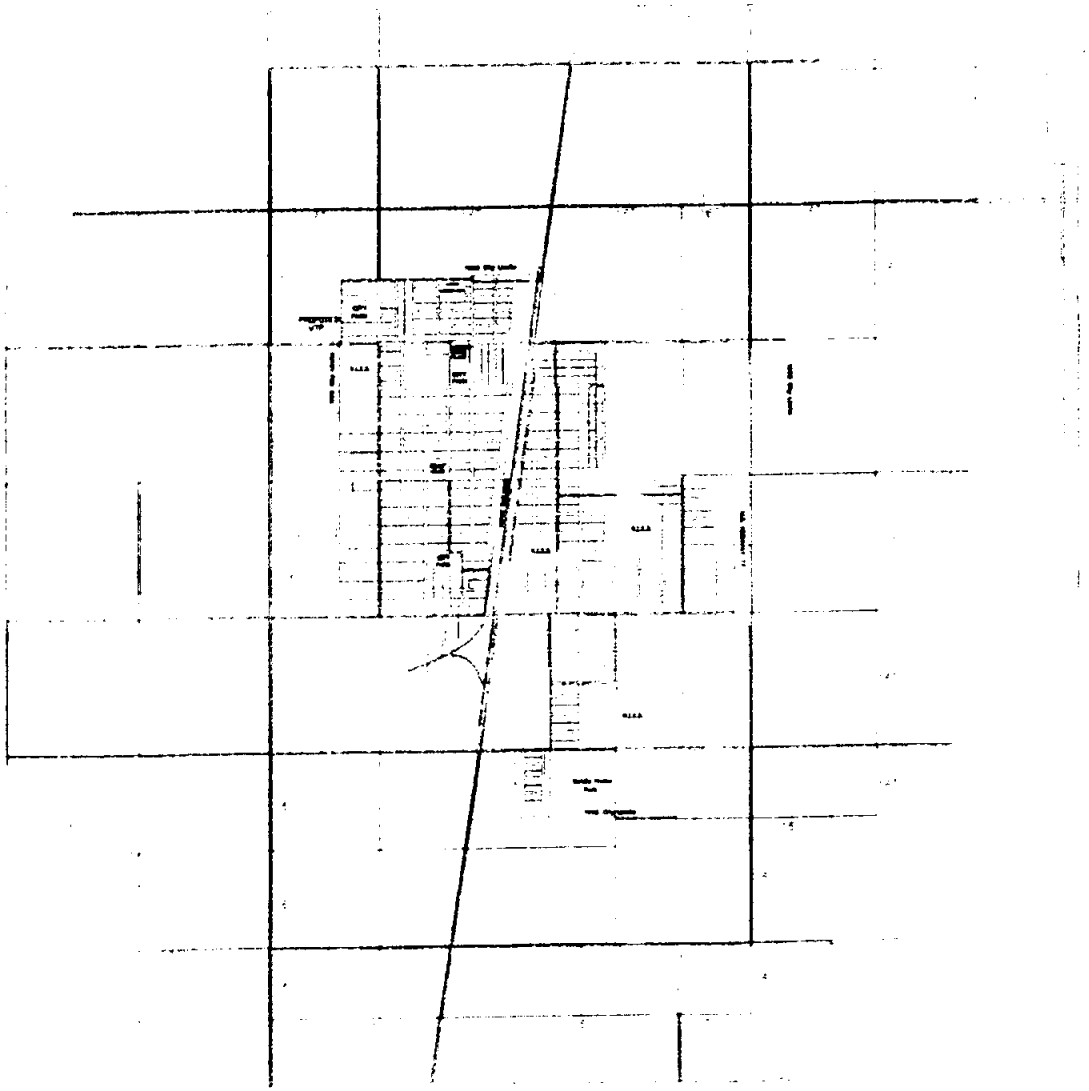
Recommended Capital Improvements Plan, Wastewater

Description	Amount
Wastewater Treatment	
Wastewater Treatment Plant (1.5mgd)	$2,250,000
Additional Sludge Drying Beds	$200,000
Collection System Improvements	
Infiltration/Inflow Study and Evaluation of Existing Collection System	$100,000
Existing Collection System Repair/ Rehabilitation	$500,000
Short Term Collection System Improvements	$1,900,000
Long Term Collection System Improvements	$5,715,000
Total	**$10,665,000**

6.4 Recommended Capital Improvement Plan – Wastewater

Table 6.2 presents the recommended capital improvements that should be implemented in the short term and long term future.

The above capital improvement plan is developed based on all the information presented in this study. Opinions of capital costs are of order of magnitude level accuracy and are based on the assumptions outlined. The cost estimates presented in **Table 6.2** are in 1998 dollars and, therefore, need to be adjusted for inflation and other unforeseen factors when the item in considered for implementation.



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SCALE

LEGEND

IMPROVEMENTS TO ADDRESS EXISTING DEFICIENCIES

SHORT TERM GROWTH

INTERMEDIATE TERM GROWTH

LONG TERM GROWTH

MAIN IMPROVEMENTS SHOWN ARE 12" EXCEPT AS INDICATED

FIGURE 6-1
RECOMMENDED DISTRIBUTION SYSTEM IMPROVEMENTS AND YEAR 2028 MASTER PLAN

CITY OF RAYMONDVILLE
RAYMONDVILLE, TEXAS

1/99 32528

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

7.0 CIP Implementation Plan

7.1 Scope of Section

This Section develops the implementation plan for Capital Improvements Projects (CIP) identified in previous sections. These projects are the recommended actions of the Water and Wastewater Master Plan for the fiscal plan years 2003 through 2028. The Implementation Plan addresses the following topics:

- Capital Improvement Plan – Year 2003
- Capital Improvement Plan – Year 2028
- Funding Plan

7.2 Capital Cost Estimates

Capital cost estimates for the Capital Improvement Projects identified in **Section 6** are presented in **Table 6.1** and **6.2**. **Table 7.1**, below, presents a breakdown of funding requirements per fiscal year for the short term and long term planning periods. A detailed breakdown of yearly costs per each CIP project is also presented in **Table 7.1** and **Table 7.2** and shown graphically in **Figure 7.1** and **Figure 7.2**.

Table 7.1
Summary of Improvements, Short Term

		(1000x dollars)	1999	2000	2001	2002	2003
Water Treatment Plant & Water Supply Reliability							
CIP-1001	Water Treatment Plant (with High Service Pump Station)	6,000	1000	1000	4000		
	Emergency Interconnects with North Alamo	100		100			
Water Storage Projects							
CIP-1002	Ground Level Storage Tank	200	100	100			
CIP-1003	Elevated Storage Tank	600		600			
Water Distribution Improvements							
CIP-1004	New 12-inch water mains within City to correct existing deficiency (shown in red in Figure 6-1)	2,100	900	600	600		
CIP-1005	New 16-inch peripheral mains and 12-inch internal loops around the City for short term growth (shown in purple in Figure 6-1)	3,400			1200	1200	1000
Annual Upgrade of Existing Mains							
CIP-1006	Upgrade of existing water mains (total for 5 years)	500	100	100	100	100	100
	Total Short Term Water CIP Funding	$12,900	2100	2500	5900	1300	1100
Wastewater Treatment Plant							
CIP-1011	New Wastewater Treatment Plant at the existing site	2,250		200	1000	1000	50
CIP-	Additional Sludge Drying Beds	200			20	90	90

1012							
Collection System Improvements							
CIP-1013	Infiltration/Inflow study Evaluation of existing collection system	200	200				
CIP-1014	Existing Collection System Repair/Rehabilitation	500		500			
CIP-1015	Short Term Collection System Improvements	1,900			600	600	700
	Total Short Term Wastewater CIP Funding	$5,050	200	700	1620	1690	840
	Total Short Term CIP Funding	**17,950**	**2,300**	**3,200**	**7,520**	**2,990**	**1,940**

Table 7.2

Summary of Improvements, Long Term

Project #	Project Description	(1000x dollars)	2008	2013	2018	2023	2028
Water System Improvements							
CIP-2001	New 16-inch backbone system around the City and 12-inch loops for intermediate term growth (shown in blue in Figure 6-1)	7,100	2200	2200	2700		
CIP-2002	New 12-inch loops around the City for long term growth (shown in green in Figure 6-1)	10,600			3500	3500	3600
	Total Long Term Water CIP Funding	$17,700	2200	2200	6200	3500	3600
Wastewater System Improvements							
CIP-2011	Long Term Collection System Improvements	5,715	1000	1000	1000	1000	1715
CIP-2020	SCADA Control System for control of WW lift stations	500					500
	Total Long Term Wastewater CIP Funding	$6,215	1000	1000	1000	1000	2215
	Total Long Term CIP Funding	**$23,915**	**$3,200**	**$3,200**	**$7,200**	**$4,500**	**$5,815**

Figure 7.1

Required Funds for Short Term CIP Implementation

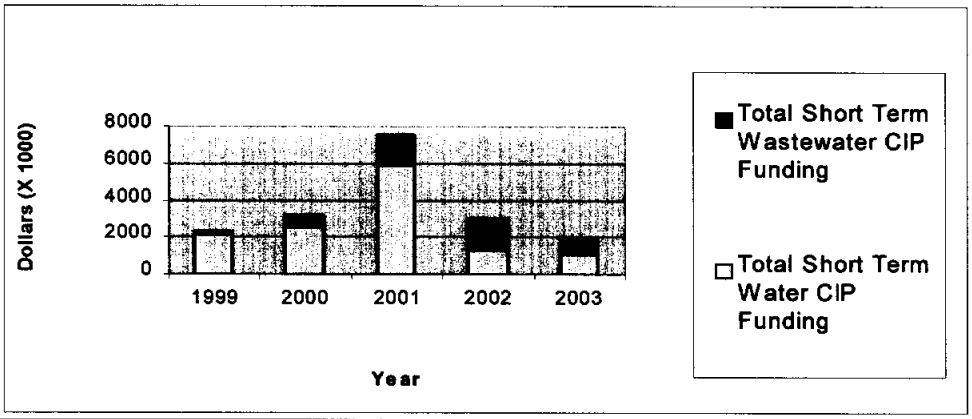
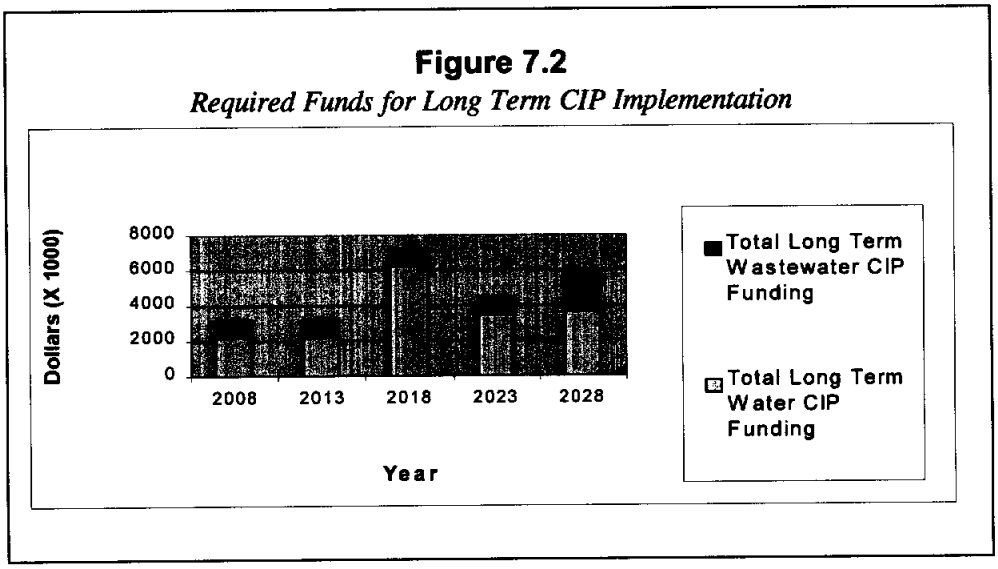


Figure 7.2
Required Funds for Long Term CIP Implementation



7.3 Capital Improvement Plan - Year 2003

A summary of Capital Improvement Projects for the short-term planning period (Year 2003) is presented in **Table 7.3**. An identification number is assigned to each project for future reference. Amount of capital needed over time is also presented in the table. Capital costs are in 1998 dollars and therefore need adjustment to account for increases in Engineering News Record (ENR) Construction Cost Index for the respective years.

Table 7.3
Funding Required for CIP Projects
Fiscal Years 1999 through 2003

Project Number	Project Category	Estimated Capital Cost (thousands)
Water Treatment Plant And Water Supply Reliability		
CIP-1001	Water Treatment Plant (with High Service Pump Station)	$6,000
	Emergency Interconnects with North Alamo Water Co.	$100
Water Storage Projects		
CIP-1002	Ground Level Storage Tank	$200
CIP-1003	Elevated Storage Tank	$600
Water Distribution Improvements		
CIP-1004	New 12-inch water mains within City to correct existing deficiency (shown in red in Figure 6-1)	$2,100
CIP-1005	New 16-inch peripheral mains and 12-inch internal loops around the City for short term growth (shown in purple in Figure 6-1)	$3,400

Annual Upgrade of Existing Mains		
CIP-1006	Upgrade of existing water mains (total for 5 years)	$500
	Total Short Term Water CIP Funding	**$12,900**
Wastewater Treatment Plant		
CIP-1010	New Wastewater Treatment Plant at the existing site	$2,250
CIP-1011	Additional Sludge Drying Beds	$200
Collection System Improvements		
CIP-1012	Infiltration/Inflow study Evaluation of existing collection system	$200
CIP-1013	Existing Collection System Repair/Rehabilitation	$500
CIP-1014	Short Term Collection System Improvements	$1,900
	Total Short Term Wastewater CIP Funding	**$5,050**

7.4 Capital Improvement Plan - Year 2028

A summary of Capital Improvement Projects for the long-term planning period (Year 2028) is presented in Table 7.4. Capital costs are in 1998 dollars and therefore need adjustment to account for increase in Engineering News Record (ENR) Construction Cost Index for the respective years. Although reasonable judgement is applied in arriving at the timeline for the occurrence of long term capital expenditure, it will be necessary to take into consideration the availability of financial resources, other priorities, and needs to ensure that the recommended improvements are implemented in an orderly, coordinated and economical manner.

Table 7.4

Funding Required for CIP Projects, Fiscal Years 2004 through 2028

Project Number	Project Category	Estimated Capital Cost (thousands)
Water System Improvements		
CIP-2001	New 16-inch backbone system around the City and 12-inch loops for intermediate term growth (shown in blue in Figure 6-1)	$7,100
CIP-2002	New 12-inch loops around the City for long term growth (shown in green in Figure 6-1)	$10,600
	Total Long Term Water CIP Funding	**$17,700**
Wastewater System Improvements		
CIP-2010	Long Term Collection System Improvements	$5,715
CIP-2020	SCADA Control System for control of WW lift stations	$500
	Total Long Term Wastewater CIP Funding	**$6,215**

7.5 Funding Plan

7.5.1 City of Raymondville Waterworks and Wastewater Fund

Billings from water and wastewater services are a major portion of the City's total revenues. A portion of these revenues can be set aside to fund the CIPs recommended in this Master Plan. As the City grows, additional residential and business service connections can bring in additional revenues that can be dedicated exclusively for the CIPs in the water and wastewater areas.

7.5.2 Economically Distressed Areas Program

The 71st Texas Legislature enacted the Economically Distressed Areas Program (EDAP) in 1989 for administration by the TWDB. The program provides financial assistance for the provision of water and wastewater services to economically distressed areas wherein present facilities are inadequate for minimal residential needs. Additionally, the program has provisions for the prevention of substandard development. An area will qualify for EDAP funding if 80 per cent of the dwellings within the project area were occupied on June 1, 1989 and per-capita income must be less than $10,000 per year.

The EDAP will provide funding for costs related to design, construction, acquisitions and improvements to water and wastewater systems. These systems include water supply, wastewater collection and treatment processes. The program does not, however, fund operations and maintenance expenses. All political entities, including cities, counties, water districts and non-profit water supply corporations are eligible for funding. Prior to acceptance, an applicant must either have or be applying for required Certificates of Public Convenience and Necessity for the project area.

7.5.3 State Revolving Funds – Water Projects

The Safe Water Drinking Act Amendments (SDWA) of 1996 authorized a Drinking Water State Revolving Fund (DWSRF) for assisting public water systems in infrastructure financing. The program enables compliance with SDWA requirements and public health objectives of the Act. In the program, the USEPA awards capitalization grants to the individual States, which in turn, provide low cost loans to eligible operating systems. Pending the approval of the proposed 1998 Federal Budget, the USEPA has allocated $70.1 million in fiscal year 1997 and $54.0 million in fiscal year 1998 to Texas for the DWSRF. The Texas Natural Resources Conservation Commission (TNRCC) is currently implementing the DWSRF. Funding procedures and guidelines are being developed for eligible public water systems.

7.5.4 State Revolving Funds – Wastewater Projects

The State Revolving Fund (SRF), administered by the Texas Water Development Board (TWDB), provides loans to any political subdivision with the authority to own and operate wastewater systems. Non-profit wastewater corporations, however, are not eligible for SRF assistance. Loans may be applied for planning, design and construction activities. These activities may include

treatment facilities, recycling processes, reuse facilities, collection systems, storm water pollution control projects and non-point source pollution control projects.
The SRF can provide traditional long-term loans and fixed rate loans that commence at the start of construction. Short term, variable rate construction period loans are available for conversion to long term, fixed rate loans within 90 days of the completion of construction. Borrowers also have the options to convert to long term, fixed-rate financing at any time prior to project completion. In either option, borrowers receive long term interest rates, which is 0.7 per cent below rates for open market loans at the time of application. The short term variable interest rate will generally be about 2.5 per cent below long term market rates at the time of application. The maximum repayment term for SRF loans is 20 years from the completion of construction.

7.5.5 US Department of Agriculture – Rural Utilities Services

Earth Tech understands that the City of Raymondville has a 1995 application for funding a water treatment plant with the Edinburg Office of RUS. The City also appears to have an application for funds with the San Benito Office of RUS for an unidentified project.

7.5.6 US Department of Commerce - Economic Development Administration

Created by Congress pursuant to the Public Works and Economic Development Act of 1965, as amended, the Economic Development Administration (EDA) provides grants for infrastructure development, local capacity building, and business development to help communities alleviate conditions of substantial and persistent unemployment and underemployment in economically distressed areas and regions. EDA publishes its programs and notices of funds availability in Federal Register as well as in its Internet site at http://www.doc.gov/eda/html/abouteda.htm

7.5.7 US Department of Interior – Bureau of Reclamation

The Bureau of Reclamation (BUR) has limited funds for wastewater reuse projects. Projects may include ground water recharge, potable water reuse, industrial consumption, agriculture, irrigation and wetlands development. BUR officials indicate that only limited funds are available for a large demand backlog. In the short term, BUR funds will not be considered a viable source of financing for the City.

7.5.8 Border Environmental Cooperation Commission

By agreement between the Government of the United States and the Government of the United Mexican States in November1993, the Border Environmental Cooperation Commission (BECC) and the North American Development Bank (NAD Bank) were formed. The BECC was organized for enhancing environmental conditions within a 100-kilometer range, either north or south, of the International Border. Through the mechanism of the NAD Bank, BECC projects are jointly funded by the American and Mexican Governments. Equal funding assistance is therefore available to American and Mexican incorporated cities within the foregoing border range. Funding is provided for planning, design and capital improvements in water, wastewater and solid waste facilities. BECC activities are administered from a central office in Juarez, Mexico.

The City of Raymondville is situated approximately 50 kilometers (31 miles), as measured at a right angle to the Border, and therefore is eligible for BECC funding assistance.

8.0 Regional Facility Plan

8.1 Introduction

Raymondville is likely to undergo rapid growth in the next millennium. It is envisioned that the Greater Raymondville area will undergo significant change in business, economy, environment, and quality of life. According to TWDB population projections, the City population is projected to grow from the 1990 population of 8,880 to 13,900 by the year 2030; this amounts to an increase of 56 percent in 40 years. The North American Free Trade Agreement (NAFTA) alone is a significant event of this decade, which can potentially increase the economy of the region by many folds.

The scope of this section is to identify the local government authorities in the region, their business, geographic location, area of influence, and potential projects and areas of cooperation.

8.2 Major Players

A regional facility plan begins with identification of the government authorities in the region. They are: City of Raymondville, Willacy County, North Alamo Water Supply Corporation, Delta Lake Irrigation District, City of Lyford and Sunnydue Water District.

Raymondville is the largest city in Willacy County, with a population of approximately 10,000. Three miles south of the City limits is the town of Lyford, with a population of approximately 2000. North Alamo Water Supply Corporation is a privately owned water purveyor that owns and operates large water treatment and distribution infrastructure facilities in the three neighboring counties: Willacy, Hidalgo, and Cameron. Willacy County is responsible for overseeing area growth patterns, approval of subdivision platting of areas outside the incorporated City limits, maintenance of county roads, health care, law and order, and other welfare programs.

8.3 North Alamo Water Supply Corporation

North Alamo Water Service Corporation has inter-local agreements with the Cities of Alamo, Edinburg, Port Mansfield, San Perlita and other area cities. North Alamo services about 1000 square miles of area in Willacy County and parts of Hidalgo and Cameron counties with potable water. The company in *not* involved in wastewater services. There are six water treatment plants, seven booster stations, and over 1800 miles of pipelines in their area of Certificate of Convenience and Necessity (CCN).

North Alamo has several pending projects, worth over 20 million dollars, for expansion and improvements to their infrastructure. One of the North Alamo projects that could benefit Raymondville involves direct interconnection with the City Park water tower.

Cooperation between Raymondville and North Alamo can benefit the City by increasing the pressure and fire flows in parts of the City, such as the western residential zone. The details of this project are not available at the present time.

8.4 Delta Lake Irrigation District

Delta Lake Irrigation District transports raw water from the Rio Grande River to the Delta Lake and supplies raw water to several communities, including Raymondville, via a canal system. The District is planning to construct an underground pipeline to bring raw water from the Lake to a location near Lasara, a town 15 miles southwest of Raymondville. A pipeline project to connect this location to the city raw water ponds could benefit the City in operation cost savings. Water transmission through pipelines minimizes evaporation and seepage losses. Cooperative arrangements with the Delta Lake Irrigation District and the City of Lyford could potentially lead to sharing of capital and operating costs for mutual benefit from this pipeline project.

8.5 Willacy County

Willacy County has access to several State-funded programs for projects that can benefit the region. The City and County, working together, can apply for funding for projects with mutual benefit. This approach provides a higher ground to realize common funding opportunities than the City working alone.

8.6 The State of Texas

A study titled "Integrated Water Reliability Plan" was developed to review the water supply reliability of several cities in the area. The study recommended several interconnects between the Cities and major water purveyors. The funding plans for the implementation of these recommendations are being developed. Once the funding is approved, some of the projects recommended in the plan for water supply reliability can be funded through the State program.

References:

1. City of Raymondville, Texas, Engineering Study: Water Supply
   Melden & Hunt, Inc. 203, South 10th Street, Edinburg, Texas, May 1996

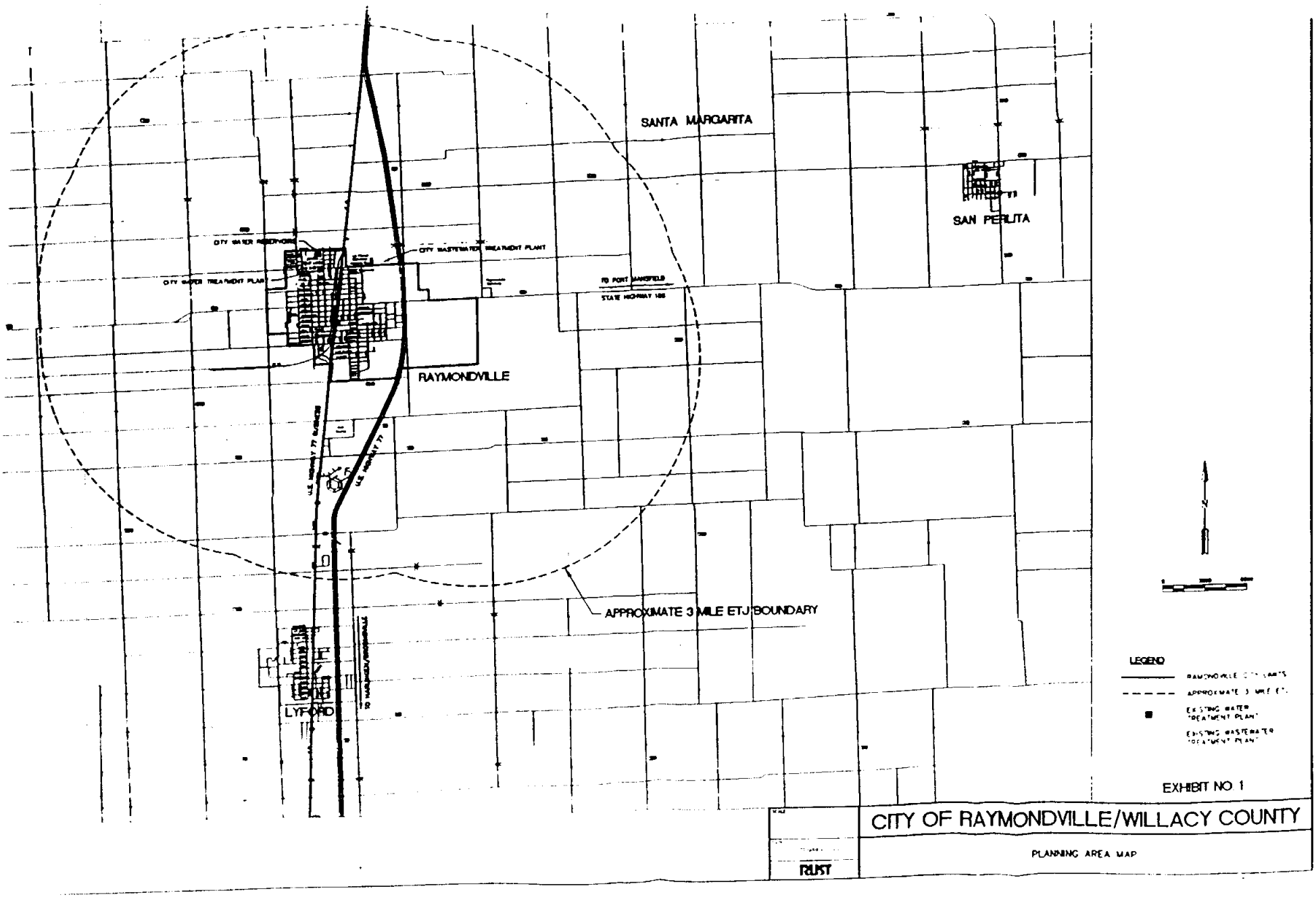
2. City of Raymondville: Comprehensive Planning Study
   Community Development Management Company
   317 South Main Street
   Lockhart, TX78644
   (512) 398-7129

3. 1996 Consensus Texas Water Plan
   Population & Consumptive Water Demand Forecasts
   Water Resources Planning Division
   Texas Water Development Board

4. Chapter 317: Design Criteria for Sewage Systems
   Texas Natural Resources Conservation Commission
   30 Texas Administrative Code
   March 1994

5. Chapter 290: Rules and Regulations for Public Water Systems
   Texas Natural Resources Conservation Commission
   December 1995

6. Chapter 217 (Proposed): First Draft Design Criteria for Sewage Systems
   Texas Natural Resources Conservation Commission
   November 1996


SANTA MARGARITA
SAN PERLITA
RAYMONDVILLE
LYFORD
APPROXIMATE 3 MILE ETJ BOUNDARY
LEGEND
EXHIBIT NO. 1
CITY OF RAYMONDVILLE/WILLACY COUNTY
PLANNING AREA MAP
RUST

1996 CONSENSUS TEXAS WATER PLAN
POPULATION & CONSUMPTIVE WATER DEMAND FORECASTS
(Water use in acre-feet per year)

HIDALGO COUNTY
MOST LIKELY GROWTH SCENARIO

City	1990	2000	2010	2020	2030	2040	2050
ALAMO							
Population	8210	11955	15447	17955	20856	22512	24299
1990 Use	1166						
Below Normal Rainfall							
Expected Conservation		1634	1955	2132	2406	2547	2749
Advanced Conservation		1567	1799	1931	2196	2345	2504
* Composite - 2020		1634	1955	1931	2196	2345	2504
Normal Rainfall							
Expected Conservation		1299	1523	1669	1869	1967	2096
Advanced Conservation		1232	1419	1508	1705	1816	1960
ALTON							
Population	3069	5098	6035	6946	7855	8572	9354
1990 Use	979						
Below Normal Rainfall							
Expected Conservation		1096	1230	1346	1505	1613	1760
Advanced Conservation		1056	1156	1237	1390	1498	1624
* Composite - 2020		1096	1230	1237	1390	1498	1624
Normal Rainfall							
Expected Conservation		868	973	1066	1179	1267	1373
Advanced Conservation		839	913	980	1100	1181	1289
DONNA							
Population	12652	16449	20627	25213	30738	35686	41430
1990 Use	2270						
Below Normal Rainfall							
Expected Conservation		2893	3396	3926	4683	5356	6172
Advanced Conservation		2782	3165	3587	4338	4997	5755
* Composite - 2020		2893	3396	3587	4338	4997	5755
Normal Rainfall							
Expected Conservation		2524	2934	3389	4028	4597	5337
Advanced Conservation		2432	2750	3135	3753	4317	4966
EDCOUCH							
Population	2878	3493	3993	4542	5266	5954	6732
1990 Use	381						
Below Normal Rainfall							
Expected Conservation		477	510	539	608	674	754
Advanced Conservation		458	470	488	554	620	694
* Composite - 2020		477	510	488	554	620	694
Normal Rainfall							
Expected Conservation		380	398	422	472	514	573
Advanced Conservation		364	367	382	431	480	535
EDINBURG							
Population	29885	40680	50467	61208	74240	85960	99531
1990 Use	5923						
Below Normal Rainfall							
Expected Conservation		7610	8932	10284	12224	13962	16054
Advanced Conservation		7382	8366	9462	11310	12999	15051
* Composite - 2020		7610	8932	9462	11310	12999	15051
Normal Rainfall							
Expected Conservation		6926	8084	9256	10977	12517	14494
Advanced Conservation		6698	7575	8570	10229	11747	13602
ELSA							
Population	5242	6233	7010	7860	9021	10140	11398
1990 Use	826						
Below Normal Rainfall							
Expected Conservation		1047	1115	1180	1314	1454	1621
Advanced Conservation		1012	1036	1074	1213	1352	1507
* Composite - 2020		1047	1115	1074	1213	1352	1507
Normal Rainfall							
Expected Conservation		831	879	924	1031	1124	1251
Advanced Conservation		803	817	845	960	1056	1175

HIDALGO COUNTY
MOST LIKELY GROWTH SCENARIO

City	1990	2000	2010	2020	2030	2040	2050
HIDALGO							
Population	3292	5031	6680	8492	10611	12472	14660
1990 Use	423						
Below Normal Rainfall							
Expected Conservation		772	958	1151	1403	1621	1905
Advanced Conservation		744	890	1046	1296	1509	1757
* Composite - 2020		772	958	1046	1296	1509	1757
Normal Rainfall							
Expected Conservation		654	801	961	1165	1355	1576
Advanced Conservation		626	748	885	1082	1257	1478
LA JOYA							
Population	2604	4133	5543	6893	8161	9108	10165
1990 Use	374						
Below Normal Rainfall							
Expected Conservation		676	844	996	1152	1265	1412
Advanced Conservation		648	789	911	1060	1173	1298
* Composite - 2020		676	844	911	1060	1173	1298
Normal Rainfall							
Expected Conservation		537	664	780	896	990	1093
Advanced Conservation		514	621	718	832	918	1025
LA VILLA							
Population	1388	2002	2552	3154	3873	4514	5159
1990 Use	193						
Below Normal Rainfall							
Expected Conservation		244	286	332	395	450	509
Advanced Conservation		233	263	297	360	415	468
* Composite - 2020		244	286	297	360	415	468
Normal Rainfall							
Expected Conservation		193	223	254	299	339	387
Advanced Conservation		184	206	230	273	313	358
MCALLEN							
Population	84021	116891	128278	139070	154689	178632	206280
1990 Use	22787						
Below Normal Rainfall							
Expected Conservation		30246	31612	32869	36041	41019	47137
Advanced Conservation		29198	29744	30221	33269	38218	43902
* Composite - 2020		30246	31612	30221	33269	38218	43902
Normal Rainfall							
Expected Conservation		26187	27445	28507	31016	35417	40667
Advanced Conservation		25401	25864	26327	28937	33015	37894
MERCEDES							
Population	12694	15962	18745	21797	25691	29302	33421
1990 Use	1889						
Below Normal Rainfall							
Expected Conservation		2718	3003	3321	3827	4300	4867
Advanced Conservation		2628	2814	3076	3568	4037	4567
* Composite - 2020		2718	3003	3076	3568	4037	4567
Normal Rainfall							
Expected Conservation		2289	2541	2808	3194	3578	4043
Advanced Conservation		2217	2373	2588	2993	3381	3819
MISSION							
Population	28653	43075	56702	71664	89235	104700	122846
1990 Use	5095						
Below Normal Rainfall							
Expected Conservation		8733	10861	13085	16093	18647	21742
Advanced Conservation		8444	10226	12202	14993	17475	20366
* Composite - 2020		8733	10861	12202	14993	17475	20366
Normal Rainfall							
Expected Conservation		6948	8574	10355	12594	14660	17063
Advanced Conservation		6707	8130	9633	11895	13839	16100

HIDALGO COUNTY
MOST LIKELY GROWTH SCENARIO

City	1990	2000	2010	2020	2030	2040	2050
PALMVIEW							
Population	1818	2607	3339	4145	5102	5951	6942
1990 Use	354						
Below Normal Rainfall							
Expected Conservation		473	557	641	772	887	1034
Advanced Conservation		438	475	501	612	707	816
* Composite - 2020		473	557	501	612	707	816
Normal Rainfall							
Expected Conservation		473	557	641	772	887	1034
Advanced Conservation		438	475	501	612	707	816
PHARR							
Population	32921	45960	61198	77929	97479	114631	134800
1990 Use	5673						
Below Normal Rainfall							
Expected Conservation		9061	11379	13792	16925	19774	23102
Advanced Conservation		8752	10694	12832	15942	18618	21743
* Composite - 2020		9061	11379	12832	15942	18618	21743
Normal Rainfall							
Expected Conservation		7207	8980	10911	13321	15408	18119
Advanced Conservation		6950	8500	10213	12557	14638	17213
SAN JUAN							
Population	10815	15296	18967	22507	25938	28571	31471
1990 Use	1982						
Below Normal Rainfall							
Expected Conservation		2947	3463	3908	4445	4833	5288
Advanced Conservation		2844	3272	3656	4155	4545	4971
* Composite - 2020		2947	3463	3656	4155	4545	4971
Normal Rainfall							
Expected Conservation		2364	2762	3126	3516	3808	4160
Advanced Conservation		2279	2613	2924	3312	3616	3948
WESLACO							
Population	21877	29435	36241	43710	52820	61044	70548
1990 Use	3255						
Below Normal Rainfall							
Expected Conservation		4946	5683	6512	7692	8752	10036
Advanced Conservation		4748	5318	5973	7100	8137	9325
* Composite - 2020		4946	5683	5973	7100	8137	9325
Normal Rainfall							
Expected Conservation		3924	4506	5092	5976	6769	7744
Advanced Conservation		3792	4222	4700	5621	6359	7349
COUNTY-OTHER							
Population	121526	180699	252667	335506	432829	510871	575261
1990 Use	17035						
Below Normal Rainfall							
* Expected Conservation		27297	34745	43250	54598	63158	71019
Advanced Conservation		26084	32481	39491	50235	58579	65220
Normal Rainfall							
Expected Conservation		21832	27386	33854	42478	48851	54909
Advanced Conservation		20820	25688	31223	39084	45989	51044

1996 CONSENSUS TEXAS WATER PLAN
POPULATION & CONSUMPTIVE WATER DEMAND FORECASTS
(Water use in acre-feet per year)

HIDALGO COUNTY
MOST LIKELY GROWTH SCENARIO

Forecast item	1990	2000	2010	2020	2030	2040	2050
MUNICIPAL COUNTY TOTAL							
Population	383545	544999	694491	858591	1054404	1228620	1404297
1990 Use	70605						
Below Normal Rainfall							
Expected Conservation		102870	120529	139264	166083	190312	217161
Advanced Conservation		99018	112958	127985	153591	177224	201568
* Composite		102870	120529	131744	157954	181803	207367
Normal Rainfall							
Expected Conservation		85436	99230	114015	134783	154048	175919
Advanced Conservation		82296	93281	105362	125376	144629	164571
MANUFACTURING	3267	3718	4115	4374	4541	4927	5307
S.E. POWER COOLING	1539	1500	2000	2000	2000	2000	2000
MINING	586	689	670	708	751	796	850
IRRIGATION - Case A	713903	742368	716214	686997	656018	628229	600069
LIVESTOCK	1003	763	763	763	763	763	763
TOTAL COUNTY WATER USE	790903						
Below Normal Rainfall							
Expected Conservation		851908	844291	834106	830156	827027	826150
Advanced Conservation		848056	836720	822827	817664	813939	810557
* Composite		851908	844291	826586	822027	818518	816356
Normal Rainfall							
Expected Conservation		834474	822992	808857	798856	790763	784908
Advanced Conservation		831334	817043	800204	789449	781344	773560

* Municipal use for cities excludes any wholesale municipal sales and identified sales to industrial users.
Below normal rainfall with expected conservation is the primary municipal water use scenario.
* Advanced conservation is implemented prior to project construction.

1996 CONSENSUS TEXAS WATER PLAN
POPULATION & CONSUMPTIVE WATER DEMAND FORECASTS
(Water use in acre-feet per year)

REGIONAL TOTAL
MOST LIKELY GROWTH SCENARIO

Forecast item	1990	2000	2010	2020	2030	2040	2050
POPULATION	401250	565157	717076	883221	1080419	1255611	1432086
MUNICIPAL WATER USE *	77299						
Below Normal Rainfall							
Expected Conservation		111301	129615	148810	176078	200597	227775
Advanced Conservation		107226	121560	136803	162875	186802	211450
* Composite		111301	129615	140695	167356	191492	217362
Normal Rainfall							
Expected Conservation		92440	106783	121954	143073	162561	184699
Advanced Conservation		89123	100439	112745	133136	152634	172815
MANUFACTURING	3267	3718	4115	4374	4541	4927	5307
S.E. POWER COOLING	1539	1500	2000	2000	2000	2000	2000
MINING	586	701	678	713	753	796	850
IRRIGATION - Case A	764403	796396	769675	739574	707497	678776	649574
LIVESTOCK	1177	907	907	907	907	907	907
TOTAL REGION WATER USE	848271						
Below Normal Rainfall							
Expected Conservation		914523	906990	896378	891776	888003	886413
Advanced Conservation		910448	898935	884371	878573	874208	870088
* Composite		914523	906990	888263	883054	878898	876000
Normal Rainfall							
Expected Conservation		895662	884158	869522	858771	849967	843337
Advanced Conservation		892345	877814	860313	848834	840040	831453

* Municipal use for cities excludes any wholesale municipal sales and identified sales to industrial users.
Below normal rainfall with expected conservation is the primary municipal water use scenario.
* Advanced conservation is implemented prior to project construction.

1996 CONSENSUS TEXAS WATER PLAN
PROJECTIONS OF POPULATION AND MUNICIPAL WATER USE
MOST LIKELY GROWTH SCENARIO
(Water use in acre-feet per year)

CITY	HISTORICAL 1990	PROJECTED 2000	2010	2020	2030	2040	2050
RAYMONDVILLE							
Population	8880	10774	12081	13181	13929	14459	15009
1990 Use	5450						
Below Normal Rainfall							
* Expected Conservation		6867	7443	7855	8254	8519	8826
Advanced Conservation		6698	7077	7294	7692	7952	8238
Composite - 2020		6867	7443	7294	7692	7952	8238
Normal Rainfall							
Expected Conservation		5757	6252	6600	6928	7143	7397
Advanced Conservation		5624	5954	6172	6506	6721	6960

Texas Water Development Board
Water Resources Planning Division

Historical Summary of City Water Use
Units: Acre-feet 1 acre-foot = 325851 gallons

City: 495 RAYMONDVILLE

Location by County and 1990 Population:
245 WILLACY 8880

Year	Self-Supplied	Other Sources	Total Ac-ft.	Pcnt GW	Mun. Sales	Ind. Sales	Power Sales	Raw Sales	Municipal Result	Popula.	GPCD
1995		5794	5794		225				5569	9329	533
1994		5286	5286		211				5075	9291	488
1993		4609	4609		219				4390	9220	425
1992		4909	4909		101				4808	9159	469
1991		5292	5292		296				4996	9076	491
1990		5779	5779		329				5450	8880	548
1989		6237	6237		349				5888	8939	588
1988		5305	5305		261				5043	9960	452
1987		4632	4632		310				4322	10045	384
1986		4815	4815		325	21			4469	10130	394
1985		4781	4781		299	21			4461	10181	391
1984		4435	4435		223	21			4191	10233	366
1983		3815	3815		163	21			3631	9955	326
1982		2898	2898		142	21			2735	9685	252
1981		3675	3675		164	21			3490	9584	325
1980	29	4123	4151	1	29	21			4101	9493	386

(1) Percapita water use units are gallons per day (GPCD).
(2) Percapita water use includes residential/commercial uses.
(3) Percapita water use is calculated on net municipal use after wholesale municipal sales, sales to outside connections, and reported industrial sales have been excluded.
(4) Population data is from U.S. Census or Texas State Data Center reports.
(5) Water use data is compiled from the TWDB Annual Survey of Ground and Surface Water Use.

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1997]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[34178500]	May	[45451100]	Sep	[40873300]		
Feb	[35169000]	Jun	[46208400]	Oct	[33701900]		
Mar	[43382500]	Jul	[68151000]	Nov	[44721600]		
Apr	[31920200]	Aug	[76922900]	Dec	[34989000]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[535669400]	Gallons	
					1643.9	Acre-feet	

Remarks: [FROM DELTA LAKE IRR DIST (AMT TREATED)]
Seller Code: [825] Metered/Est: [1]
If purchased, % RAW =[ ], % TREATED =[100]; Connections: 2777
Outside conn: 109 Pop served: 8880 % Connections metered: 99.0
% Connections: RES 96 COMM 4.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1997]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[ ]	May	[ ]	Sep	[ ]		
Feb	[ ]	Jun	[ ]	Oct	[ ]		
Mar	[ ]	Jul	[ ]	Nov	[ ]		
Apr	[ ]	Aug	[ ]	Dec	[ ]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[ ]	Gallons	
						Acre-feet	

Remarks: [NO RAW AMOUNT PUMPAGE 1997\SW DELTA LK]
Seller Code: [825] Metered/Est: [ ]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2777
Outside conn: 109 Pop served: 8880 % Connections metered: 99.0
% Connections: RES 96 COMM 4.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1996]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[40850000]	May	[52254300]	Sep	[44122000]		
Feb	[45603300]	Jun	[64782200]	Oct	[35905200]		
Mar	[40687700]	Jul	[65309000]	Nov	[48735900]		
Apr	[50037700]	Aug	[65309000]	Dec	[37099600]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[590695900]	Gallons	
					1812.8	Acre-feet	

Remarks: [FROM DELTA LAKE IRR DIST (AMT TREATED)]
Seller Code: [825] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2750
Outside conn: 414 Pop served: 8880 % Connections metered: 99.0
% Connections: RES 96 COMM 4.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS

* * YEAR [1996]

245 - 22

78580-2591

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[44132000]	May	[59510000]	Sep	[48058000]		
Feb	[44931000]	Jun	[54997000]	Oct	[50211000]		
Mar	[47611000]	Jul	[65744000]	Nov	[47638000]		
Apr	[56290000]	Aug	[54080000]	Dec	[49097000]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[622299000]	Gallons	
					1909.8	Acre-feet	

Remarks: [SW FROM DELTA LAKE I.D. ALSO]
Seller Code: [825] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2750
Outside conn: 414 Pop served: 8880 % Connections metered: 99.0
% Connections: RES 96 COMM 4.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS

* * YEAR [1995]

245 - 22

78580-2591

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[33394000]	May	[67947500]	Sep	[48183300]		
Feb	[42449000]	Jun	[42567600]	Oct	[38955200]		
Mar	[45886500]	Jul	[52114500]	Nov	[37917900]		
Apr	[42554000]	Aug	[54864700]	Dec	[32581200]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[539415400]	Gallons	
					1655.4	Acre-feet	

Remarks: [FROM DELTA LAKE IRR DIST (AMT TREATED)]
Seller Code: [825] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2800
Outside conn: Pop served: 8880 % Connections metered: 100
% Connections: RES 98 COMM 2.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS

* * YEAR [1995]

245 - 22

78580-2591

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[ ]	May	[ ]	Sep	[ ]		
Feb	[ ]	Jun	[ ]	Oct	[ ]		
Mar	[ ]	Jul	[ ]	Nov	[ ]		
Apr	[ ]	Aug	[ ]	Dec	[ ]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1348538500]	Gallons	
					4138.5	Acre-feet	

Remarks: [CANAL LOSS ESTIMATE (2.5 X TREATED WTR)]
Seller Code: [825] Metered/Est: [ ]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2800
Outside conn: Pop served: 8880 % Connections metered: 100
% Connections: RES 98 COMM 2.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1994]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[29915000]	May	[40020100]	Sep	[35005400]			
Feb	[31429200]	Jun	[42281900]	Oct	[38016000]			
Mar	[31270600]	Jul	[66892200]	Nov	[40008000]			
Apr	[40448800]	Aug	[61300000]	Dec	[35498600]	Units:		
	WATER TYPE [PS]		ANNUAL TOTAL		[492085800]	Gallons		
					1510.2	Acre-feet		

Remarks: [FROM DELTA LAKE IRR DIST (AMT TREATED)]
Seller Code: [825] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2000
Outside conn: 100 Pop served: 9000 % Connections metered: 100
% Connections: RES 98 COMM 2.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1994]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[ ]	May	[ ]	Sep	[ ]			
Feb	[ ]	Jun	[ ]	Oct	[ ]			
Mar	[ ]	Jul	[ ]	Nov	[ ]			
Apr	[ ]	Aug	[ ]	Dec	[ ]	Units:		
	WATER TYPE [PS]		ANNUAL TOTAL		[1230214500]	Gallons		
					3775.4	Acre-feet		

Remarks: [CANAL LOSS ESTIMATE (2.5 X TREATED WTR)]
Seller Code: [825] Metered/Est: [ ]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2000
Outside conn: 100 Pop served: 9000 % Connections metered: 100
% Connections: RES 98 COMM 2.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1993]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[95406500]	May	[118030500]	Sep	[132531000]			
Feb	[98854000]	Jun	[116676000]	Oct	[106515500]			
Mar	[111975500]	Jul	[158173750]	Nov	[115258500]			
Apr	[132454000]	Aug	[199790500]	Dec	[116054750]	Units:		
	WATER TYPE [PS]		ANNUAL TOTAL		[1501720500]	Gallons		
					4608.6	Acre-feet		

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2750
Outside conn: 90 Pop served: 8880 % Connections metered: 100
% Connections: RES 96 COMM 4.0 IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1992]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[110812800]	May	[127659700]	Sep	[134249150]		
Feb	[102400200]	Jun	[154433650]	Oct	[120635200]		
Mar	[138924600]	Jul	[204251250]	Nov	[97629000]		
Apr	[128924600]	Aug	[178652600]	Dec	[101020850]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1599593600]	Gallons	
					4909.0	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO. WCID #1]
Seller Code: [810] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2612
Outside conn: 125 Pop served: 8880 % Connections metered: 100
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1991]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[ ]	May	[ ]	Sep	[ ]		
Feb	[ ]	Jun	[ ]	Oct	[ ]		
Mar	[ ]	Jul	[ ]	Nov	[ ]		
Apr	[ ]	Aug	[ ]	Dec	[ ]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1724322000]	Gallons	
					5291.7	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [1]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2612
Outside conn: 122 Pop served: 8880 % Connections metered: 99.0
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1990]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[147708300]	May	[138095700]	Sep	[154681500]		
Feb	[122878400]	Jun	[200039900]	Oct	[167422200]		
Mar	[137672000]	Jul	[175112300]	Nov	[161719900]		
Apr	[134218000]	Aug	[183682200]	Dec	[159862500]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1883092900]	Gallons	
					5779.0	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [ ]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2552
Outside conn: 125 Pop served: 9493 % Connections metered: 100
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1989]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[144378100]	May	[189319400]	Sep	[186060900]		
Feb	[159406300]	Jun	[184105800]	Oct	[181824900]		
Mar	[186005500]	Jul	[183780000]	Nov	[157386000]		
Apr	[161947900]	Aug	[169116700]	Dec	[129037000]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[2032368500]	Gallons	
					6237.1	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [ ]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2552
Outside conn: 125 Pop served: 9493 % Connections metered: 99.0
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1988]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[93225971]	May	[176317976]	Sep	[137639462]		
Feb	[93323726]	Jun	[184301326]	Oct	[154485959]		
Mar	[117241190]	Jul	[172179668]	Nov	[147480163]		
Apr	[144547504]	Aug	[173711168]	Dec	[134087687]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1728541800]	Gallons	
					5304.7	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [ ]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2552
Outside conn: 106 Pop served: 9348 % Connections metered: 100
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1987]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[79409888]	May	[131969655]	Sep	[137085515]		
Feb	[91661886]	Jun	[114113020]	Oct	[137509122]		
Mar	[107987021]	Jul	[161687266]	Nov	[124018890]		
Apr	[135716941]	Aug	[183128262]	Dec	[105054362]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1509341828]	Gallons	
					4632.0	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [ ]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2552
Outside conn: Pop served: % Connections metered:
% Connections: RES COMM IND ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1986]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[115598901]	May	[154867205]	Sep	[143495005]		
Feb	[100261095]	Jun	[125534098]	Oct	[120196659]		
Mar	[138421505]	Jul	[185783948]	Nov	[98550377]		
Apr	[160136216]	Aug	[134019258]	Dec	[92186507]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1569050774]	Gallons	
					4815.2	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID 1]
Seller Code: [810] Metered/Est: [1]
If purchased, % RAW =[100], % TREATED =[ ]; Connections: 2595
Outside conn: 101 Pop served: 9348 % Connections metered: 100
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1985]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[97967103]	May	[152892548]	Sep	[126866828]		
Feb	[91306709]	Jun	[150647434]	Oct	[114354150]		
Mar	[107524313]	Jul	[170638393]	Nov	[126218385]		
Apr	[127163353]	Aug	[172815078]	Dec	[119626419]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1558020713]	Gallons	
					4781.4	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY CO WCID #1]
Seller Code: [810] Metered/Est: [1]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2580
Outside conn: 101 Pop served: 9348 % Connections metered: 99.0
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

========== TWDB WATER USE SURVEY - MUNICIPAL USERS ==========

TWDB CODE: [719400]

CITY OF RAYMONDVILLE

C/O VENTURA NIETO, DIR. PUB. WKS
142 SOUTH 7TH STREET
RAYMONDVILLE, TEXAS 78580-2591

* * YEAR [1984]

245 - 22

HIDALGO
SOURCE COUNTY [108]
SOURCE BASIN [23]
AQUIFER 15 -[ ]
NUMBER WELLS [ ]
RESERVOIR [23070]
STATUS = 0

Jan	[83417856]	May	[135554016]	Sep	[95800194]		
Feb	[78855942]	Jun	[151520715]	Oct	[102643065]		
Mar	[118935615]	Jul	[166835712]	Nov	[113070297]		
Apr	[145003695]	Aug	[147936354]	Dec	[105575724]	Units:	
	WATER TYPE [PS]		ANNUAL TOTAL		[1445149185]	Gallons	
					4435.0	Acre-feet	

Remarks: [FROM HIDALGO-WILLACY WCID #1]
Seller Code: [810] Metered/Est: [1]
If purchased, % RAW =[ ], % TREATED =[ ]; Connections: 2575
Outside conn: 106 Pop served: 9348 % Connections metered: 100
% Connections: RES 90 COMM 9.0 IND 1.0 ; EFFLUENT(gal)

15 Apr 98

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

No.: 2460001 Connections: 2800

Name: City of Raymondville Texas Population: 8800

Name Number: Raymondville WATERWORKS Month/Year: MAR 98

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data						SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3		

COMPLIANCE DATA

RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA							FINISHED WATER QUALITY							
				Zone 1		Zone 2		Zone 3		SOR	TURBIDITY						DISINFECTANT	
		NTU	TEMP	D1	pH1	D2	pH2	D3	pH3	REQD?	NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest Residual	Time*
1.185	1.805	32	16	4.8	7.9	3.6	7.1	NA	NA	NO	0.1	0.1	0.1	0.09	0.1	0.2	1.5	
1.224	1.840	32	15	4.5	8.0	3.9	7.0	NA	NA	NO	0.2	0.2	0.2	0.2	2.4	1.4	1.5	
1.205	1.839	34	16	4.6	7.8	3.6	7.2	NA	NA	NO	0.4	0.3	0.2	0.3	0.2	0.2	1.0	
1.303	1.840	34	16	4.5	7.8	3.7	7.3	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.2	1.5	
1.238	1.631	42	16	4.3	7.9	3.7	7.2	NA	NA	NO	0.3	0.2	0.1	0.2	0.1	0.1	1.0	
1.246	1.780	35	17	4.4	7.9	3.7	7.2	NA	NA	NO	0.2	0.1	0.1	0.2	0.1	0.1	1.0	
1.240	1.658	38	13	3.9	7.8	3.4	7.2	NA	NA	NO	0.2	0.3	0.2	0.1	0.1	0.2	1.0	
1.163	1.784	31	13	4.6	7.7	3.4	7.0	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.1	1.5	
1.212	1.691	44	13	3.8	7.9	3.8	7.1	NA	NA	NO	0.1	0.1	0.2	0.2	0.3	0.3	0.5	
1.201	1.504	38	13	5.3	7.9	4.2	7.2	NA	NA	NO	0.3	0.1	0.1	0.1	0.2	0.1	1.5	
209	1.853	31	14	4.5	7.9	3.8	7.0	NA	NA	NO	02	0.1	0.1	0.1	0.2	02	1.5	
1.050	1.551	34	14	5.0	7.9	4.0	7.1	NA	NA	NO	02	0.1	0.1	0.1	0.1	0.1	1.5	
1.148	1.462	35	14	4.8	7.8	3.9	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.3	0.3	1.5	
1.100	1.378	32	14	4.6	7.8	3.9	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	02	2.0	
1.112	1.368	35	15	4.8	7.8	3.6	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	02	1.5	
1.159	1.384	42	15	4.6	7.8	3.4	7.2	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.3	0.5	
1.252	1.691	39	15	4.2	7.8	3.6	7.2	NA	NA	NO	0.2	0.2	0.1	0.2	0.1	02	2.0	
1.257	1.644	36	16	3.9	7.8	3.3	7.1	NA	NA	NO	02	0.2	0.2	0.1	0.1	0.2	0.5	
1.207	1.431	35	16	3.9	7.7	3.2	7.1	NA	NA	NO	03	0.2	0.2	0.1	0.2	02	0.5	
1.360	1.729	39	16	4.0	7.7	3.4	7.1	NA	NA	NO	0.3	0.2	0.2	0.1	0.1	0.1	1.5	
1.265	1.484	38	16	3.8	7.8	3.5	7.1	NA	NA	NO	0.1	0.1	0.09	0.2	0.1	0.1	1.0	
1.286	1.605	33	16	4.2	7.8	3.8	7.0	NA	NA	NO	0.1	0.1	0.1	0.3	0.2	0.2	1.5	
1.408	1.866	32	17	4.3	7.8	3.7	7.1	NA	NA	NO	0.1	0.1	0.3	0.2	0.1	0.2	1.5	
1.386	1.861	23	17	3.5	7.8	3.4	7.0	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	1.5	
1.316	1.644	24	17	3.9	7.8	3.3	7.0	NA	NA	NO	0.1	0.1	0.1	0.2	0.3	0.2	1.5	
1.351	1.905	26	17	3.3	7.9	3.2	7.2	NA	NA	NO	0.2	0.1	0.1	0.2	0.1	0.1	1.5	
1.482	1.543	34	17	2.9	7.8	3.2	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	1.5	
1.597	2.016	32	18	3.2	7.8	3.6	7.2	NA	NA	NO	0.1	0.2	0.2	0.1	0.2	0.3	1.5	
1.420	1825	26	18	4.2	7.8	3.5	7.2	NA	NA	NO	02	0.1	0.1	0.2	0.2	0.2	1.0	
1.621	1.633	35	19	3.8	7.8	2.7	7.2	NA	NA	NO	02	0.3	0.2	0.3	0.2	0.3	1.0	
1.619	1.742	31	19	3.7	7.8	3.1	7.2	NA	NA	NO	02	0.1	0.1	0.1	02	02	1.5	
39.834	51.039	Disinfectant No. 1:		Free Cl2														
1.285	1.646	Disinfectant No. 2:		Free Cl2														
.621	2.016	Disinfectant No. 3:																
050	1.378	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

SUBMITTED BY: Rubén Cantú Certificate No. and Grade: 64-58-3074 B DATE: 4/1/98

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

PUBLIC WATER SYSTEM NAME: City of Raymondville, Texas PLANT NAME OR NUMBER: Raymondville WATER WORKS

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

PWS ID No.: 2450001 Report for Month of: MARCH 98

Operator's Signature: Roberto Contreras

Certificate No. and Grade: 464-58-3074 B Date: 4/1/98

TREATMENT PLANT PERFORMANCE

Total number of turbidity readings: 186

Number of readings above 0.5 NTU: 0

Number of readings above 1.0 NTU: 0

No. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU (95%)

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data — Maximum turbidity reported: ____ NTU; Minimum turbidity reported: ____ NTU; Average turbidity value: ____ NTU; Standard Deviation: ____ NTU

Was a Supplemental Operating Report for CT Determination required this month? NO Was one submitted? NO

Number of days with low CT for less than 4.0 consecutive hours: ____

Number of days with a low CT for more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

Minimum disinfectant residual required leaving the plant: 0.8 mg/l (free) / total (circle one)

Number of days with a low residual for less than 4.0 consecutive hours: 0

Number of days with a low residual for more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

Minimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

Total number of tests this month: 310

Number of readings with a low residual: 0

Number of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable levels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT requirements for more than 4.0 consecutive hours? - see (3) above	N		
Were there any periods when the residual leaving the plant fell below acceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels for two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

No.: 2450006 Connections: 2800

System Name: City of Raymondville tex Population: 8800

Name Number: Raymondville WATERWORKS Month/Year: Feb 98

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data						SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3		

COMPLIANCE DATA

RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA							FINISHED WATER QUALITY							
				Zone 1		Zone 2		Zone 3			TURBIDITY						DISINFECTANT	
		NTU	TEMP	D1	pH1	D2	pH2	D3	pH3	SOR REQD?	NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest Residual	Time*
1.157	1.817	30	13	3.8	8.0	3.7	7.2	NA	NA	NO	0.08	0.1	0.1	0.2	0.2	0.1	1.0	
1.121	1.561	21	14	5.0	7.9	3.9	7.2	NA	NA	NO	0.2	0.2	0.2	0.2	0.2	0.2	1.0	
1.196	1.787	28	13	4.2	7.8	3.7	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.1	0.1	1.5	
1.054	1.594	25	13	5.0	7.9	3.7	7.2	NA	NA	NO	0.2	0.2	0.2	0.2	0.2	0.2	1.0	
1.088	1.640	31	12	4.2	8.0	3.7	7.2	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.1	1.0	
1.075	1.651	38	14	4.1	7.9	3.5	7.4	NA	NA	NO	0.2	0.1	0.2	0.2	0.2	0.2	1.0	
1.114	1.506	31	13	4.1	7.9	3.6	7.1	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.2	1.5	
1.079	1.516	31	14	4.5	8.0	3.6	7.0	NA	NA	NO	0.3	0.2	0.2	0.1	0.09	0.2	1.0	
1.234	1.655	33	15	5.0	8.0	3.7	7.2	NA	NA	NO	0.4	0.3	0.2	0.4	0.2	0.2	1.5	
1.230	1.556	36	15	4.1	8.1	3.6	7.2	NA	NA	NO	0.2	0.2	0.1	0.2	0.4	0.4	1.0	
.160	1.425	28	15	4.5	7.9	3.8	7.2	NA	NA	NO	0.2	0.2	0.1	0.2	0.3	0.4	1.0	
1.214	1.767	34	14	4.5	7.8	3.8	7.3	NA	NA	NO	0.4	0.2	0.2	0.2	0.1	0.1	1.0	
1.163	1.722	47	14	4.6	7.8	3.8	7.1	NA	NA	NO	0.2	0.1	0.1	0.2	0.1	0.1	1.5	
.902	1.255	44	14	4.0	7.8	3.7	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.1	0.1	1.0	
1.057	1.734	42	14	4.8	7.8	3.5	7.1	NA	NA	NO	0.08	0.07	0.07	0.1	0.2	0.2	1.0	
1.112	1.528	38	14	3.9	7.9	3.4	7.1	NA	NA	NO	0.1	0.1	0.2	0.1	0.1	0.1	1.0	
1.011	1.390	35	13	3.7	7.8	3.2	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.3	0.3	1.5	
1.216	1.675	34	14	3.8	7.9	3.4	7.1	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.2	1.0	
1.049	1.360	25	14	4.6	8.0	3.6	7.1	NA	NA	NO	0.2	0.2	0.1	0.2	0.3	0.2	1.0	
1.077	1.352	24	14	4.9	7.9	3.6	7.1	NA	NA	NO	0.1	0.1	0.2	0.2	0.1	0.2	1.0	
1.113	1.168	37	14	3.9	8.0	3.7	7.1	NA	NA	NO	0.4	0.3	0.2	0.3	0.2	0.2	1.0	
.966	1.447	42	15	4.4	8.0	3.4	7.0	NA	NA	NO	0.1	0.1	0.2	0.2	0.3	0.3	1.0	
1.131	1.739	46	15	3.8	7.8	3.3	7.1	NA	NA	NO	0.3	0.1	0.1	0.1	0.1	0.2	1.5	
1.176	1.772	47	16	3.8	7.8	3.7	7.1	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.2	1.0	
1.142	1.800	43	16	4.1	7.8	3.5	7.1	NA	NA	NO	0.4	0.3	0.2	0.2	0.2	0.3	1.0	
1.197	1.797	47	16	4.0	7.8	3.7	7.2	NA	NA	NO	0.2	0.2	0.2	0.3	0.1	0.2	1.5	
1.162	1.818	40	16	4.4	7.9	3.7	7.0	NA	NA	NO	0.2	0.1	0.1	0.2	0.1	0.2	1.5	
1.334	1.554	38	16	3.7	7.8	3.5	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.2	1.0	
31.466	44.658	Disinfectant No. 1: Free Cl2																
1.128	1.594	Disinfectant No. 2: Free Cl2																
1.334	1.818	Disinfectant No. 3:																
.902	1.168	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

SUBMITTED BY: [signature] Certificate No. and Grade: 464-58-3074 B DATE: 3/2/98

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

PUBLIC WATER SYSTEM NAME: City of Raymondville, Texas

PLANT NAME OR NUMBER: Raymondville Waterworks

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

PWS ID No.: 2450001

Report for Month of: Feb 98

Operator's Signature:

Certificate No. and Grade: 46458-3074 B

Date: 3/5/98

TREATMENT PLANT PERFORMANCE

Total number of turbidity readings: 148

Number of readings above 0.5 NTU: 8

Number of readings above 1.0 NTU: 8

No. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

Was a Supplemental Operating Report for CT Determination required this month? NO

Was one submitted? NO

Number of days with low CT for less than 4.0 consecutive hours: ____

Number of days with a low CT for more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

Minimum disinfectant residual required leaving the plant: 0.8 mg/l (free) / total (circle one)

Number of days with a low residual for less than 4.0 consecutive hours: 0

Number of days with a low residual for more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

Minimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

Total number of tests this month: 280

Number of readings with a low residual: 0

Number of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable levels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT requirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below acceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels for two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

No.: 2450001 Connections: 2800

System Name: City of Raymondville, Texas Population: 8800

Plant Name/Number: Raymondville WATER WORKS Month/Year: JAN-98

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data							SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3			

COMPLIANCE DATA												FINISHED WATER QUALITY							
RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA								TURBIDITY						DISINFECTANT	
				Zone 1		Zone 2		Zone 3		SOR REQD?								Lowest Residual	Time*
		NTU	TEMP	D1	pH1	D2	pH2	D3	pH3			NTU1	NTU2	NTU3	NTU4	NTU5	NTU6		
1.145	1.060	15	15	5.5	8.1	3.9	7.3	NA	NA	NO		0.1	0.1	0.09	0.09	0.1	0.1	2.0	
1.279	1.749	18	14	5.2	8.1	3.9	7.4	NA	NA	NO		0.1	0.1	0.1	0.1	0.2	0.2	2.0	
1.386	1.933	18	14	5.0	8.1	3.9	7.5	NA	NA	NO		0.1	0.1	0.1	0.2	0.1	0.1	1.5	
1.119	1.715	15	16	4.7	8.0	3.6	7.2	NA	NA	NO		0.1	0.01	0.08	0.06	0.01	0.1	2.0	
1.344	1.764	33	16	4.5	7.9	3.3	7.3	NA	NA	NO		0.1	0.1	0.2	0.1	0.2	0.1	0.2	
1.178	1.784	20	16	4.6	7.9	3.3	7.2	NA	NA	NO		0.1	0.1	0.1	0.1	0.1	0.1	1.5	
1.156	1.909	20	14	5.1	8.0	3.6	7.2	NA	NA	NO		0.1	0.1	0.08	0.08	0.1	0.1	2.0	
1.216	1.771	23	13	3.6	7.0	3.8	7.3	NA	NA	NO		0.2	0.1	0.1	0.1	0.2	0.1	2.0	
1.306	1.834	25	17	3.8	8.0	3.2	7.2	NA	NA	NO		0.1	0.1	0.04	0.1	0.1	0.2	1.5	
1.263	1815	31	16	4.0	8.0	3.4	7.3	NA	NA	NO		0.1	0.1	0.1	0.1	0.2	0.1	2.0	
1.224	1.739	28	16	4.3	7.9	3.5	7.3	NA	NA	NO		0.1	0.1	0.09	0.1	0.2	0.2	1.5	
1.434	1.819	25	16	3.9	8.0	3.6	7.3	NA	NA	NO		0.2	0.1	0.2	0.1	0.2	0.1	1.5	
1.198	1.633	26	14	5.3	7.9	3.5	7.3	NA	NA	NO		0.2	0.2	0.1	0.1	0.1	0.2	1.5	
1.263	1.406	22	14	4.2	8.1	3.8	7.1	NA	NA	NO		0.2	0.1	0.09	0.2	0.1	0.1	2.0	
1.167	1801	31	14	4.3	8.0	3.6	7.2	NA	NA	NO		0.1	0.05	0.01	0.1	0.1	0.1	1.5	
1.170	1.702	21	14	4.7	7.8	3.6	7.3	NA	NA	NO		0.1	0.1	0.09	0.09	0.1	0.2	0.5	
1.161	1579	27	14	4.3	7.9	3.6	7.2	NA	NA	NO		0.1	0.1	0.1	0.1	0.1	0.1	1.0	
1.076	1714	24	13	4.8	7.9	3.4	7.2	NA	NA	NO		0.01	0.01	0.1	0.1	0.1	0.1	2.0	
1.336	1925	26	14	4.0	8.0	3.2	7.2	NA	NA	NO		0.09	0.09	0.08	0.1	0.1	0.1	1.0	
1232	1722	28	14	4.0	8.1	3.6	7.2	NA	NA	NO		0.1	0.1	0.1	0.1	0.07	0.1	1.5	
1.304	1.840	31	13	4.0	8.0	3.3	7.2	NA	NA	NO		0.2	0.1	0.1	0.1	0.1	0.1	1.0	
1.078	1.465	54	14	4.4	8.0	3.4	7.2	NA	NA	NO		0.1	0.09	0.1	0.2	0.1	0.1	1.5	
1.112	1.647	39	14	5.1	8.1	3.3	7.2	NA	NA	NO		0.1	0.1	0.1	0.1	0.1	0.2	1.5	
1.210	1.698	27	14	4.0	8.2	3.6	7.1	NA	NA	NO		0.2	0.2	0.1	0.09	0.1	0.1	1.0	
1224	1.598	33	13	4.6	8.0	3.6	7.1	NA	NA	NO		0.2	0.1	0.1	0.09	0.2	0.2	0.5	
1.162	1.894	31	14	4.3	8.2	3.8	7.2	NA	NA	NO		0.1	0.1	0.09	0.08	0.09	0.1	1.5	
1.362	1.832	20	14	4.2	8.2	3.6	7.2	NA	NA	NO		0.1	0.1	0.1	0.1	0.2	0.1	0.5	
1.331	1.673	27	14	4.5	8.2	3.3	7.3	NA	NA	NO		0.1	0.1	0.2	0.3	0.3	0.3	0.5	
1.386	1.774	31	14	4.1	8.2	3.4	7.3	NA	NA	NO		0.2	0.1	0.1	0.2	0.3	0.4	1.0	
1.289	1.832	30	14	4.5	8.2	3.8	7.3	NA	NA	NO		0.2	0.1	0.1	0.1	0.09	0.1	0.5	
1.301	1.934	28	14	3.8	7.9	3.9	7.2	NA	NA	NO		0.1	0.1	0.04	0.3	0.1	0.1	1.5	
38.355	54.531	Disinfectant No. 1:				Free Cl2													
1.237	1.759	Disinfectant No. 2:				Free Cl2													
1.434	1.434	Disinfectant No. 3:																	
018	1.406	Distribution Disinfectant:																	

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

SUBMITTED BY: Roberto Contreras Certificate No. and Grade: 469-58-3074 B DATE: 2/2/98

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

WATER SYSTEM NAME: City of Raymondville, Texas

PLANT NAME OR NUMBER: Raymondville Waterworks

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

PWS ID No.: 2450001

Report for Month of: January 98

Operator's Signature: Roberto Cisneros

Certificate No. and Grade: 464-58-3074 B

Date: 2/2/98

TREATMENT PLANT PERFORMANCE

Total number of turbidity readings: 186

Number of readings above 0.5 NTU: 0

Number of readings above 1.0 NTU: 0

No. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data — Maximum turbidity reported: ____ NTU; Minimum turbidity reported: ____ NTU; Average turbidity value: ____ NTU; Standard Deviation: ____ NTU

Was a Supplemental Operating Report for CT Determination required this month? NO Was one submitted? NO

Number of days with low CT for less than 4.0 consecutive hours: ____

Number of days with a low CT for more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

Minimum disinfectant residual required leaving the plant: 0.8 mg/l (free) / total (circle one)

Number of days with a low residual for less than 4.0 consecutive hours: NONE

Number of days with a low residual for more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

Minimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

Total number of tests this month: 310

Number of readings with a low residual: 0

Number of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable levels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT requirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below acceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels for two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

No.: 2450001 Connections: 2800

Name: City of Raymondville Texas Population: 8800

Name nber: Raymondville Water Works Month/Year: Dec 97

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data						SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3		

COMPLIANCE DATA

RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA						SOR REQD?	FINISHED WATER QUALITY TURBIDITY						DISINFECTANT	
				Zone 1		Zone 2		Zone 3									Lowest Residual	Time*
		NTU	TEMP	D1	pH1	D2	pH2	D3	pH3		NTU1	NTU2	NTU3	NTU4	NTU5	NTU6		
1.337	1.789	15	19	4.3	7.9	4.0	7.1	NA	NA	NO	0.1	0.08	0.08	0.1	0.1	0.1	1.0	
1.317	1.653	10	19	5.0	7.9	4.1	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.3	0.1	1.5	
1.395	1.530	13	18	5.0	8.0	4.2	7.1	NA	NA	NO	0.1	0.1	0.09	0.1	0.1	0.1	1.5	
1.154	1.661	26	18	5.0	8.0	4.2	7.1	NA	NA	NO	0.08	0.08	0.07	0.1	0.1	0.2	1.5	
1.153	1.696	25	17	4.4	8.0	3.6	7.1	NA	NA	NO	0.1	0.07	0.08	0.08	0.1	0.1	1.5	
1.216	1.859	16	17	4.1	8.0	3.7	7.1	NA	NA	NO	0.1	0.07	0.1	0.1	0.1	0.1	1.0	
1.288	1.812	26	18	4.5	7.9	3.9	7.1	NA	NA	NO	0.1	0.08	0.1	0.1	0.1	0.1	1.0	
1.400	1.832	23	18	4.5	7.9	3.6	7.1	NA	NA	NO	0.1	0.1	0.2	0.08	0.1	0.1	1.5	
1.401	1.952	34	17	4.6	7.9	3.7	7.1	NA	NA	NO	0.1	0.08	0.09	0.2	0.09	0.1	2.0	
1.309	1.826	33	16	5.2	8.0	3.7	7.2	NA	NA	NO	0.1	0.1	0.09	0.1	0.1	0.1	0.5	
172	1.830	13	16	3.9	8.0	3.5	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.08	0.1	1.0	
1.049	1.445	10	11	4.6	8.0	3.9	7.0	NA	NA	NO	0.08	0.08	0.06	0.07	0.1	0.08	0.5	
1.293	1.610	11	11	4.2	8.0	3.9	7.2	NA	NA	NO	0.06	0.06	0.1	0.1	0.1	0.1	2.0	
1.273	1.636	12	12	5.5	8.0	4.3	7.0	NA	NA	NO	0.08	0.06	0.05	0.1	0.1	0.1	2.0	
1.343	1.843	12	12	4.5	8.2	3.4	7.3	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	2.0	
1.330	1.754	13	12	5.0	8.1	3.8	7.3	NA	NA	NO	0.09	0.07	0.06	0.1	0.1	0.09	2.0	
1.246	1.697	13	14	5.0	8.0	3.9	7.2	NA	NA	NO	0.08	0.08	0.1	0.1	0.1	0.1	1.5	
1.201	1.797	11	14	4.5	8.1	3.8	7.1	NA	NA	NO	0.09	0.1	0.09	0.09	0.09	0.1	1.5	
1.288	1.688	12	16	5.0	8.4	3.7	7.1	NA	NA	NO	0.09	0.08	0.1	0.1	0.1	0.1	2.0	
1.164	1.415	14	16	4.2	8.2	3.6	7.2	NA	NA	NO	0.09	0.09	0.1	0.1	0.2	0.1	2.0	
1.097	1.735	18	16	5.0	8.1	3.6	7.2	NA	NA	NO	0.08	0.07	0.07	0.06	0.07	0.1	2.0	
1.360	1.863	17	16	4.0	8.1	3.3	7.2	NA	NA	NO	0.1	0.09	0.09	0.1	0.1	0.07	1.0	
1.302	1.807	19	16	4.2	8.0	3.2	7.3	NA	NA	NO	0.1	0.1	0.1	0.2	0.1	0.1	1.0	
1.280	1.662	23	16	4.9	8.1	3.6	7.2	NA	NA	NO	0.1	0.1	0.09	0.1	0.1	0.09	1.5	
1.049	1451	16	16	5.0	8.0	3.5	7.3	NA	NA	NO	0.07	0.07	0.1	0.1	0.2	0.1	1.5	
1.078	1.537	15	16	5.3	8.1	3.6	7.2	NA	NA	NO	0.1	0.1	0.09	0.1	0.2	0.1	1.5	
1.190	1.566	18	16	4.3	8.1	3.4	7.2	NA	NA	NO	0.1	0.1	0.08	0.1	0.1	0.2	2.0	
1.119	1.584	19	13	5.2	8.1	3.9	7.3	NA	NA	NO	0.1	0.1	0.07	0.08	0.1	0.2	1.0	
1.092	1.666	16	12	4.9	8.1	3.8	7.1	NA	NA	NO	0.1	0.08	0.08	0.09	0.1	0.1	1.0	
1.287	1.924	15	11	4.6	7.9	3.4	7.1	NA	NA	NO	0.1	0.08	0.08	0.1	0.1	0.2	1.5	
1.226	1.600	16	12	4.6	8.1	3.3	7.2	NA	NA	NO	0.1	0.08	0.1	0.1	0.3	0.3	1.0	
38,400	52.742	Disinfectant No. 1:		Free Clz														
1.238	1.702	Disinfectant No. 2:		Free Clz														
401	1.952	Disinfectant No. 3:																
.049	1.415	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

MITTED BY: Heberto Cortez Certificate No. and Grade: 464-58-3074 B DATE: 1-2-98

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

: WATER TEM NAME: City of Raymondville Texas

PLANT NAME OR NUMBER: Raymondville Waterworks

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

S ID No.: 2450001

ort for Month of: DEC 97

Operator's Signature: Roberto Cortinas

Certificate No. and Grade: 44-58-3074 B

Date: 1-1-98

TREATMENT PLANT PERFORMANCE

otal number of turbidity readings: 186

umber of readings above 0.5 NTU: 8

umber of readings above 1.0 NTU: 0

o. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

as a Supplemental Operating Report for CT Determination required this month? NO

Was one submitted? NA

umber of days with low CT r less than 4.0 consecutive hours: ____

umber of days with a low CT r more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

linimum disinfectant residual required leaving the plant: 0.08 mg/l (free) / total (circle one)

umber of days with a low residual r less than 4.0 consecutive hours: 0

umber of days with a low residual ore than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

linimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

otal number of tests this month: 310

umber of readings with a low residual: 0

umber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
ere any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
ere more than 5.0% of the turbidity readings above acceptable vels? - see (2) above	NO		
ere there any periods when the plant failed to meet the CT equirements for more than 4.0 consecutive hours? - see (3) above	NO		
ere there any periods when the residual leaving the plant fell below ceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
id the residual in the distribution system fall below acceptable levels r two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

ID No.: 2450001 Connections: 2800

tem Name: City of Raymondville Texas Population: 8800

nt Name Number: Raymondville Water Works Month/Year: NOV 97

TREATMENT PROCESS PARAMETERS									WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data							SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3			

COMPLIANCE DATA

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA							FINISHED WATER QUALITY							
					Zone 1		Zone 2		Zone 3			TURBIDITY						DISINFECTANT	
			NTU	TEMP	D1	pH1	D2	pH2	D3	pH3	SOR REQD?	NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest Residual	Time*
1	1.596	1.963	25	22	3.4	7.4	3.8	7.1	NA	NA	NO	0.1	0.1	0.3	0.2	0.2	0.1	0.5	
2	1.226	1.806	24	23	3.2	7.5	3.4	7.1	NA	NA	NO	0.1	0.1	0.1	0.3	0.2	0.2	0.5	
3	1.426	1.749	27	22	3.7	7.5	3.5	7.1	NA	NA	NO	0.2	0.1	0.1	0.2	0.08	0.08	1.0	
4	1.559	1.945	31	22	3.4	7.5	3.7	7.1	NA	NA	NO	0.06	0.06	0.2	0.2	0.1	0.1	1.0	
5	1.358	1.781	29	22	4.6	7.5	3.9	7.0	NA	NA	NO	0.09	0.01	0.07	0.1	0.2	0.2	2.0	
6	1.263	1.717	31	21	5.4	7.6	4.1	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.2	2.0	
7	1.246	1.637	31	21	4.6	7.5	4.1	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.2	2.0	
8	1.249	1.620	26	21	4.6	7.5	4.1	7.1	NA	NA	NO	0.1	0.1	0.08	0.09	0.2	0.1	1.0	
9	1.111	1.694	30	20	5.0	7.4	4.3	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.2	1.0	
	1.237	1.651	34	18	4.8	7.5	3.2	7.3	NA	NA	NO	0.2	0.1	0.1	0.3	0.2	0.2	1.0	
	1.119	1.405	31	17	4.3	7.5	3.2	7.2	NA	NA	NO	0.2	0.1	0.1	0.1	0.2	0.1	1.0	
12	1.142	1.699	26	17	4.5	7.7	3.5	7.5	NA	NA	NO	0.2	0.1	0.1	0.2	0.20	0.1	1.5	
13	1.264	1.713	29	17	3.7	7.7	3.8	7.4	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.1	2.0	
14	1.196	1.778	25	17	3.4	7.8	3.7	7.3	NA	NA	NO	0.1	0.1	0.1	0.2	0.3	0.2	1.0	
15	1.206	1.488	46	18	3.6	7.9	3.6	7.4	NA	NA	NO	0.5	0.4	0.2	0.3	0.2	0.2	1.0	
16	1.087	1.403	43	16	4.6	7.9	3.2	7.4	NA	NA	NO	0.1	0.1	0.1	0.09	1.0	0.3	1.0	
17	1.234	1.439	34	14	3.2	8.1	3.4	7.6	NA	NA	NO	0.3	0.3	0.2	0.2	0.2	0.2	1.0	
18	1.142	1.277	4.2	15.3	3.3	8.2	3.3	7.5	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.1	1.5	
19	1.313	1.654	38	15	3.6	7.9	3.6	7.3	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.1	1.5	
20	1.214	1.406	24	17	3.5	7.7	3.5	7.1	NA	NA	NO	0.1	0.09	0.08	0.1	0.2	0.2	1.5	
21	1.236	1.730	17	17	4.1	7.8	3.2	7.1	NA	NA	NO	0.2	0.1	0.08	0.1	0.1	0.1	1.5	
22	1.180	1.386	19	17	3.5	7.8	3.6	7.1	NA	NA	NO	0.1	0.1	0.09	0.1	0.2	0.1	2.0	
23	1.175	1.729	17	18	3.8	7.7	3.6	7.0	NA	NA	NO	0.09	0.09	0.06	0.07	0.1	0.1	2.0	
24	1.271	1.874	15	17	3.4	7.8	3.5	7.1	NA	NA	NO	0.1	0.09	0.09	0.08	0.1	0.1	1.5	
25	1.267	1.927	19	18	3.5	7.8	3.4	7.1	NA	NA	NO	0.1	0.1	0.08	0.08	0.1	0.1	1.5	
26	1.490	1.909	20	20	4.2	7.8	3.7	7.0	NA	NA	NO	0.1	0.1	0.09	0.09	0.2	0.2	1.5	
27	1.245	1.817	16	20	4.0	7.9	3.3	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	1.0	
28	1.469	1.923	22	20	4.6	7.9	3.6	7.1	NA	NA	NO	0.1	0.1	0.1	0.3	0.09	0.08	1.0	
29	1.443	1.670	19	20	3.9	7.9	3.6	7.1	NA	NA	NO	0.1	0.09	0.08	0.08	0.1	0.1	1.0	
30	1.298	1.759	11	20	4.8	8.0	3.8	7.1	NA	NA	NO	0.06	0.06	0.04	0.08	0.1	0.2	1.5	
31																			
otal	38.254	50.555	Disinfectant No. 1:				Free Cl2												
VG	1.275	1.685	Disinfectant No. 2:				Free Cl2												
	1.596	1.963	Disinfectant No. 3:																
		1.214	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

UBMITTED BY: Robert Contreras Certificate No. and Grade: 64-58-3074 B DATE: 12/1/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

LIC WATER TEM NAME: City of Raymondville, Texas

PLANT NAME OR NUMBER: Raymondville Water Works

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

S ID No.: 2450001

ort for Month of: Nov 97

Operator's Signature: _____

Certificate No. and Grade: _____ Date: _____

TREATMENT PLANT PERFORMANCE

tal number of turbidity readings: 180

mber of readings above 0.5 NTU: 0

mber of readings above 1.0 NTU: 0

. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: _____ NTU

Minimum turbidity reported: _____ NTU

Average turbidity value: _____ NTU

Standard Deviation: _____ NTU

as a Supplemental Operating Report for CT Determination required this month? NO Was one submitted? NO

mber of days with low CT r less than 4.0 consecutive hours: _____

umber of days with a low CT r more than 4.0 consecutive hours: _____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: _____

inimum disinfectant residual required leaving the plant: 0.08 mg/l (free) total (circle one)

umber of days with a low residual ss than 4.0 consecutive hours: 0

..ber of days with a low residual r more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

inimum disinfectant residual required in the distribution system: 0.2 mg/l (free) total (circle one)

otal number of tests this month: 300

umber of readings with a low residual: 0

umber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable evels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT equirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below cceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels or two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

.D No.: 2450001 Connections: 2800

em Name: City of Raymondville, Texas Population: 8800

it Name lumber: Raymondville Waterworks Month/Year: Oct, 97

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data: Temp	D1	pH1	D2	pH2	D3	pH3	SOR REQD?	Turbidity Limit	Residual Limit

COMPLIANCE DATA

E	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES NTU	TEMP	DISINFECTION PROCESS DATA Zone 1 D1	pH1	Zone 2 D2	pH2	Zone 3 D3	pH3	SOR REQD?	FINISHED WATER QUALITY TURBIDITY NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	DISINFECTANT Lowest Residual	Time*
1	1.332	1.764	11	26	4.1	7.8	4.1	7.0	NA	NA	NO	0.3	0.1	0.1	0.3	0.1	0.1	0.5	
2	1.425	1.812	13	26	4.4	7.8	4.1	7.0	NA	NA	NO	0.1	0.2	0.3	0.2	0.2	0.2	0.5	
3	1.358	1.579	16	25	4.1	7.6	4.0	7.0	NA	NA	NO	0.2	0.2	0.3	0.2	0.2	0.1	0.7	
4	1.196	1.679	18	25	3.7	7.5	4.1	7.0	NA	NA	NO	0.1	0.1	0.2	0.2	0.1	0.1	0.5	
5	1.153	1.482	16	26	4.3	7.5	4.2	6.9	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.3	0.3	
6	1.268	1.593	15	25	3.0	7.6	3.3	6.9	NA	NA	NO	0.3	0.1	0.1	0.1	0.2	0.1	0.5	
7	1.187	1.772	11	25	3.5	7.5	3.5	6.8	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.1	0.5	
8	1.204	1.805	15	26	3.8	7.6	3.7	7.0	NA	NA	NO	0.1	0.1	0.2	0.4	0.2	0.2	1.0	
9	1.201	1.531	15	26	4.2	7.6	3.4	6.9	NA	NA	NO	0.2	0.2	0.1	0.1	0.3	0.2	0.5	
	.164	1.393	12	23	3.3	7.6	3.1	6.9	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.2	0.3	
11	1.220	1.784	16	26	3.2	7.5	3.3	7.0	NA	NA	NO	0.4	0.1	0.1	0.1	0.1	0.1	1.0	
12	1.206	1.789	11	25	3.2	7.5	3.5	6.8	NA	NA	NO	0.1	0.1	0.1	0.4	0.1	0.1	1.0	
13	1.123	1.426	15	25	4.3	7.4	3.7	7.0	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.2	0.4	
14	1.183	1.804	21	23	3.4	7.6	3.5	7.1	NA	NA	NO	0.3	0.1	0.1	0.2	0.1	0.2	0.7	
15	1.172	1.775	19	20	4.4	7.5	3.6	7.0	NA	NA	NO	0.2	0.2	0.1	0.2	0.1	0.1	0.5	
16	1.152	1.765	14	20	3.6	7.5	3.4	7.1	NA	NA	NO	0.2	0.2	0.1	0.2	0.2	0.2	1.0	
17	1.155	1.783	19	20	3.7	7.5	3.4	7.0	NA	NA	NO	0.3	0.2	0.1	0.2	0.2	0.2	1.0	
18	1.238	1.705	22	22	4.5	7.5	3.5	6.9	NA	NA	NO	0.4	0.3	0.2	0.2	0.1	0.1	1.0	
19	1.224	1.672	19	23	4.6	7.5	3.9	7.0	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.1	0.5	
20	1.375	1.754	14	23	4.6	7.6	4.5	7.1	NA	NA	NO	0.1	0.2	0.2	0.2	0.2	0.2	1.0	
21	1.229	1.704	22	23	4.6	7.7	3.6	7.1	NA	NA	NO	0.3	0.3	0.1	0.1	0.1	0.2	1.5	
22	1.233	1.790	26	23	4.0	7.8	3.5	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.3	1.0	
23	1.150	1.744	25	23	4.2	7.9	3.4	7.3	NA	NA	NO	0.3	0.2	0.1	0.1	0.1	0.3	0.6	
24	1.241	1.821	28	24	4.5	8.1	4.1	7.7	NA	NA	NO	0.3	0.2	0.2	0.1	0.1	0.3	1.0	
25	1.275	1.837	26	22	3.8	8.1	3.7	7.7	NA	NA	NO	0.3	0.2	0.1	0.1	0.2	0.1	1.5	
26	1.255	1.689	25	20	3.3	8.0	3.9	7.5	NA	NA	NO	0.3	0.2	0.2	0.2	0.3	0.4	1.0	
27	1.214	1.868	31	21	3.6	8.1	3.6	7.2	NA	NA	NO	0.4	0.3	0.2	0.2	0.2	0.2	1.0	
28	1.270	1.776	27	21	3.7	8.0	4.0	7.2	NA	NA	NO	0.3	0.2	0.1	0.1	0.2	0.2	0.7	
29	1.214	1.764	31	21	3.1	7.8	3.8	7.4	NA	NA	NO	0.3	0.2	0.2	0.2	0.2	0.2	0.7	
30	1.317	1.752	31	22	4.0	7.8	3.1	7.0	NA	NA	NO	0.1	0.1	0.09	0.2	0.3	0.3	0.5	
31	1.345	1.754	29	22	3.8	7.5	3.6	6.9	NA	NA	NO	0.2	0.1	0.1	0.1	0.2	0.1	0.5	
tal	38.913	53.169	Disinfectant No. 1: FREE CL2																
x	1.239	1.715	Disinfectant No. 2: FREE CL2																
	1.375	1.868	Disinfectant No. 3:																
-	1.123	1.393	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

BMITTED BY: Robert Martinez Certificate No. and Grade: 464-58-3074 B DATE: 11/3/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

: WATER 4 NAME: City of Raymondville, Texas

PLANT NAME OR NUMBER: Raymondville Waterworks

) No.: 2450001

for oth of: OCT 97

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: Lakeith Cantu

Certificate No. and Grade: 464-58-3074 B

Date: 11/3/97

TREATMENT PLANT PERFORMANCE

number of turbidity readings: 186

Number of 4-hour periods when plant was off-line: 0

ber of readings above 0.5 NTU: 0

ber of readings above 1.0 NTU: 0

Maximum Allowable Turbidity level: 05 NTU

f days with values above 5.0 NTU: 0 (1)

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

a Supplemental Operating Report for CT Determination required this month? NO

Was one submitted? NO

ber of days with low CT ss than 4.0 consecutive hours: ____

ber of days with a low CT ore than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

mum disinfectant residual required leaving the plant: 0.8 mg/l (free) / total (circle one)

ber of days with a low residual an 4.0 consecutive hours: 0

ber of days with a low residual ore than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

mum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

l number of tests this month: 310

ber of readings with a low residual: 0

ber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
e any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
e more than 5.0% of the turbidity readings above acceptable s? - see (2) above	NO		
e there any periods when the plant failed to meet the CT irements for more than 4.0 consecutive hours? - see (3) above	NO		
e there any periods when the residual leaving the plant fell below ptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
the residual in the distribution system fall below acceptable levels two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

D No.: 2450001 Connections: 2800

em Name: CITY of Raymondville, TEXAS Population: 8800

it Name lumber: Raymondville WATERWORKS Month/Year: SEPT 97

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data: Temp	D1	pH1	D2	pH2	D3	pH3	SOR REQD?	Turbidity Limit	Residual Limit

COMPLIANCE DATA

	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES: NTU	TEMP	DISINFECTION PROCESS DATA: Zone 1 D1	Zone 1 pH1	Zone 2 D2	Zone 2 pH2	Zone 3 D3	Zone 3 pH3	SOR REQD?	FINISHED WATER QUALITY: TURBIDITY NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	DISINFECTANT: Lowest Residual	Time*
1	1.954	2.249	19	14	3.2	7.4	4.1	6.9	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.2	0.3	
2	1.650	1.870	18	13	3.1	7.4	3.6	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.2	0.2	
3	1.672	1.921	15	26	3.5	7.4	4.1	6.9	NA	NA	NO	0.3	0.2	0.2	0.2	0.1	0.2	1.0	
4	1.654	1.875	13	26	3.8	7.5	4.5	6.9	NA	NA	NO	0.2	0.2	0.1	0.2	0.1	0.2	1.0	
5	1.418	1.822	13	27	4.2	7.6	4.5	7.0	NA	NA	NO	0.2	0.3	0.2	0.2	0.1	0.1	0.5	
6	1.244	1.768	15	26	2.9	7.5	3.7	7.1	NA	NA	NO	0.1	0.2	0.2	0.2	0.2	0.2	0.5	
7	1.259	1.566	14	26	3.5	7.4	4.0	7.1	NA	NA	NO	0.2	0.3	0.2	0.1	0.1	0.3	0.3	
8	1.455	1.781	14	26	3.1	7.5	3.6	7.1	NA	NA	NO	0.2	0.1	0.3	0.2	0.1	0.2	0.2	
9	1.448	1.710	17	24	3.8	7.5	4.5	7.2	NA	NA	NO	0.3	0.2	0.2	0.2	0.1	0.1	0.3	
10	.428	1.754	14	24	2.7	7.5	3.6	7.0	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.3	0.2	
11	1.629	1.892	17	25	3.1	7.5	3.8	7.1	NA	NA	NO	0.2	0.2	0.2	0.1	0.2	0.2	0.2	
12	1.761	2.017	21	25	3.7	7.7	3.7	7.2	NA	NA	NO	0.3	0.3	0.2	0.3	0.1	0.2	0.6	
13	1.685	1.931	17	24	2.6	7.5	3.4	7.2	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	0.4	
14	1.530	1.977	14	24	4.4	7.4	3.7	7.2	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.1	0.2	
15	1.389	1.833	16	24	3.8	7.4	3.4	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.2	0.5	
16	1.444	1.728	15	24	3.3	7.3	3.6	6.9	NA	NA	NO	0.2	0.1	0.1	0.2	0.1	0.1	0.5	
17	1.487	1.773	12	24	3.6	7.4	4.0	6.9	NA	NA	NO	0.1	0.1	0.1	0.09	0.08	0.09	0.5	
18	1.176	1.615	10	24	3.9	7.4	4.0	6.9	NA	NA	NO	0.08	0.08	0.09	0.1	0.1	0.09	0.5	
19	1.254	1.777	11	28	3.7	7.4	4.1	6.8	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	0.6	
20	1.320	1.692	12	26	3.8	7.4	4.0	6.8	NA	NA	NO	0.1	0.1	0.1	0.09	0.1	0.1	0.5	
21	1.209	1.435	12	26	4.5	7.4	3.5	6.8	NA	NA	NO	0.2	0.2	0.1	0.1	0.3	0.1	0.2	
22	1.336	1.797	12	27	4.3	7.5	4.0	6.9	NA	NA	NO	0.2	0.2	0.3	0.2	0.2	0.2	1.0	
23	1.250	1.748	16	26	4.8	7.6	3.9	7.0	NA	NA	NO	0.1	0.1	0.2	0.1	0.2	0.1	0.5	
24	1.261	1.748	68	26	3.6	7.5	3.6	6.7	NA	NA	NO	0.1	0.2	0.2	0.2	0.1	0.1	1.0	
25	1.273	1.705	13	26	3.8	7.5	3.7	6.8	NA	NA	NO	0.2	0.1	0.1	0.1	0.2	0.2	0.5	
26	1.241	1.698	9	26	4.1	7.6	4.0	6.8	NA	NA	NO	0.1	0.1	0.1	0.09	0.1	0.1	0.5	
27	1.316	1.624	12	25	3.9	7.5	4.1	6.9	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.1	0.7	
28	1.345	1.712	12	26	4.4	7.8	4.4	6.9	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.2	0.5	
29	1.334	1.744	12	26	3.1	7.7	4.1	6.9	NA	NA	NO	0.2	0.1	0.1	0.2	0.2	0.3	0.7	
30	1.354	1.733	12	25	4.0	7.7	4.0	6.9	NA	NA	NO	0.3	0.2	0.2	0.1	0.3	0.3	1.0	
31																			
ad	42.737	53.499																	
s	1.424	1.783																	
	.954	2.249																	
	1.176	1.561																	

Disinfectant No. 1: FREE Cl2

Disinfectant No. 2: FREE Cl2

Disinfectant No. 3:

Distribution Disinfectant:

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

BMITTED BY: Roberto Cortinas Certificate No. and Grade: 64-58-3014B DATE: 10/14/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

IC WATER EM NAME: City of Raymondville, Texas PLANT NAME OR NUMBER: Raymondville Waterworks

ID No.: 2450001

rt for fonth of: Sept 97

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

Operator's Signature: Roberto Contreras

Certificate No. and Grade: 464-58-3074 B Date: 10/1/97

TREATMENT PLANT PERFORMANCE

al number of turbidity readings: 180

nber of readings above 0.5 NTU: 0

nber of readings above 1.0 NTU: 0

of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

s a Supplemental Operating Report for CT Determination required this month? NO Was one submitted? NO

nber of days with low CT less than 4.0 consecutive hours: 0

nber of days with a low CT more than 4.0 consecutive hours: 0 (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: 0

nimum disinfectant residual required leaving the plant: 0.8 mg/l (free) / total (circle one)

nber of days with a low residual s than 4.0 consecutive hours: 0

nber of days with a low residual more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

nimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

tal number of tests this month: 300

nber of readings with a low residual: 0

nber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
ere any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
ere more than 5.0% of the turbidity readings above acceptable els? - see (2) above	NO		
ere there any periods when the plant failed to meet the CT quirements for more than 4.0 consecutive hours? - see (3) above	NO		
ere there any periods when the residual leaving the plant fell below ceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
d the residual in the distribution system fall below acceptable levels two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

PWS ID No.: 2450006 Connections: 2800

System Name: CITY OF RAYMONDVILLE, TEXAS Population: 8800

Plant Name or Number: RAYMONDVILLE WATER WORKS Month/Year: AUG 97

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data							SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3			

COMPLIANCE DATA

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA						SOR REQD?	FINISHED WATER QUALITY							
					Zone 1		Zone 2		Zone 3			TURBIDITY						DISINFECTANT	
			NTU	TEMP	D1	pH1	D2	pH2	D3	pH3		NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest Residual	Time*
1	2.306	2.477	30	25	3.9	7.4	4.2	7.2	NA	NA	NO	0.1	0.1	0.2	0.1	0.1	0.1	0.6	
2	1.991	2.170	27	24	4.2	7.5	4.4	7.2	NA	NA	NO	0.1	0.1	0.1	0.2	0.09	0.08	0.5	
3	1.888	2.295	33	24	3.8	7.4	4.4	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.3	1.7	
4	2.158	2.458	32	24	3.4	7.4	4.4	7.2	NA	NA	NO	0.1	0.1	0.2	0.2	0.1	0.1	1.0	
5	2.402	2.368	33	25	3.9	7.4	4.3	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.2	1.0	
6	2.487	2.461	35	25	4.3	7.5	4.7	7.2	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.1	0.5	
7	2.606	2.482	31	24	4.2	7.6	4.2	7.1	NA	NA	NO	0.2	0.2	0.2	0.1	0.1	0.1	0.7	
8	2.415	2.520	32	24	3.4	7.5	4.2	7.0	NA	NA	NO	0.1	0.1	0.1	0.09	0.1	0.1	1.0	
9	2.431	2.547	33	24	3.2	7.4	3.9	7.0	NA	NA	NO	0.1	0.1	0.1	0.2	0.1	0.1	0.5	
10	2.350	2.571	43	20	3.2	7.4	4.2	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	0.7	
11	2.351	2.492	35	22	3.8	7.4	4.4	7.1	NA	NA	NO	0.1	0.1	0.2	0.1	0.1	0.1	0.6	
12	2.464	2.238	28	20	3.1	7.5	3.1	7.1	NA	NA	NO	0.3	0.3	0.1	0.2	0.1	0.1	1.0	
13	2.367	2.451	23	20	3.1	7.7	3.6	7.2	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
14	2.423	2.312	36	20	2.9	7.6	3.7	7.1	NA	NA	NO	0.1	0.2	0.1	0.1	0.1	0.1	0.4	
15	2.466	2.327	25	20	2.8	7.5	3.4	7.0	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.2	0.4	
16	2.283	2.417	29	20	2.7	7.5	4.0	7.0	NA	NA	NO	0.2	0.2	0.2	0.1	0.1	0.1	0.2	
17	2.165	2.466	29	19	3.7	7.4	3.7	7.0	NA	NA	NO	0.1	0.09	0.09	0.08	0.1	0.1	0.2	
18	2.357	2.417	32	19	2.9	7.6	3.7	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.1	0.5	
19	2.524	2.485	28	19	3.3	7.6	4.2	7.1	NA	NA	NO	0.1	0.1	0.2	0.1	0.1	0.09	0.5	
20	2.366	2.506	23	18	3.3	7.5	3.9	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.09	0.09	0.4	
21	2.234	2.395	22	16	4.3	7.5	4.5	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.09	0.1	0.3	
22	2.182	2.349	22	17	3.2	7.5	4.3	7.1	NA	NA	NO	0.1	0.1	0.2	0.1	0.2	0.3	0.2	
23	2.352	2.448	23	16	3.7	7.5	3.7	7.1	NA	NA	NO	0.2	0.2	0.3	0.1	0.1	0.3	0.4	
24	2.116	2.349	22	16	3.8	7.6	3.5	6.9	NA	NA	NO	0.3	0.2	0.2	0.1	0.3	0.1	0.2	
25	2.129	2.819	20	14	4.2	7.5	3.7	6.9	NA	NA	NO	0.3	0.3	0.2	0.1	0.09	0.1	0.2	
26	1.942	2.259	21	15	3.8	7.5	3.4	6.9	NA	NA	NO	0.3	0.2	0.2	0.1	0.2	0.1	0.5	
27	1.752	2.068	20	14	4.0	7.6	3.5	6.9	NA	NA	NO	0.2	0.3	0.1	0.2	0.1	0.1	0.7	
28	1.957	2.256	18	14	3.2	7.5	3.3	6.9	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.3	0.3	
29	2.146	2.055	19	13	3.5	7.4	3.8	6.9	NA	NA	NO	0.3	0.3	0.1	0.1	0.3	0.4	0.4	
30	2.137	2.405	19	14	3.8	7.4	3.8	6.9	NA	NA	NO	0.3	0.3	0.2	0.2	0.2	0.2	0.7	
31	1.992	2.338	21	14	4.1	7.4	4.1	6.8	NA	NA	NO	0.1	0.1	0.1	0.3	0.3	0.3	1.0	
Total	69.739	74.101	Disinfectant No. 1: FREE CL2									* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.							
MAX	2.349	2.340	Disinfectant No. 2: FREE CL2																
	2.606	2.819	Disinfectant No. 3:																
MIN	1.752	2.055	Distribution Disinfectant:																

SUBMITTED BY: Robert D Martinez Certificate No. and Grade: 46458-3074B DATE: 9/1/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

LIC WATER EM NAME: City of Raymondville, TEX

PLANT NAME OR NUMBER: Raymondville Water works

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

S ID No.: 2450001

ort for Month of: Aug. 97

Operator's Signature: Pablo Cantu

Certificate No. and Grade: 464-58-3074

Date: 9/1/97

TREATMENT PLANT PERFORMANCE

tal number of turbidity readings: 186

mber of readings above 0.5 NTU: 0

mber of readings above 1.0 NTU: 0

. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

as a Supplemental Operating Report for CT Determination required this month? NO

Was one submitted? NO

mber of days with low CT r less than 4.0 consecutive hours: ____

mber of days with a low CT r more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

inimum disinfectant residual required leaving the plant: 0.8 mg/l (free) total (circle one)

umber of days with a low residual ss than 4.0 consecutive hours: 0

.ber of days with a low residual r more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

inimum disinfectant residual required in the distribution system: 0.2 mg/l (free) total (circle one)

otal number of tests this month: 310

umber of readings with a low residual: 0

umber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
ere any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
ere more than 5.0% of the turbidity readings above acceptable vels? - see (2) above	NO		
ere there any periods when the plant failed to meet the CT equirements for more than 4.0 consecutive hours? - see (3) above	NO		
ere there any periods when the residual leaving the plant fell below ceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
id the residual in the distribution system fall below acceptable levels r two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

D No.: 2450001 Connections: 2800

em Name: City of Raymondville, Tex Population: 8800

it Name Number: Raymondville Water Works Month/Year: July, 97

TREATMENT PROCESS PARAMETERS									WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data							SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3			
3.0	10°C	0.5	8.0	0.5	8.0	—	—		0.5	0.2

COMPLIANCE DATA

E	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA							FINISHED WATER QUALITY							
					Zone 1		Zone 2		Zone 3		SOR REQD?	TURBIDITY						DISINFECTANT	
			NTU	TEMP	D1	pH1	D2	pH2	D3	pH3		NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest DIST. Residual	Time*
1	2.059	2.417	43	28	3.2	7.4	4.7	7.0	NA	NA	NO	0.1	0.1	0.2	0.1	0.1	0.2	0.5	
2	2.038	2.441	36	28	3.2	7.3	4.3	7.0	NA	NA	NO	0.2	0.1	0.1	0.1	0.2	0.2	1.0	
3	2.062	2.376	45	27	3.2	7.3	4.0	7.1	NA	NA	NO	0.1	0.1	0.3	0.2	0.2	0.1	0.5	
4	2.135	2.425	46	28	3.5	7.2	4.4	7.0	NA	NA	NO	0.3	0.2	0.1	0.1	0.3	0.2	0.5	
5	2.069	2.442	49	27	3.3	7.3	4.4	7.0	NA	NA	NO	0.2	0.1	0.1	0.1	0.2	0.1	0.5	
6	2.049	2.214	43	27	3.9	7.5	4.4	7.1	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.1	0.6	
7	2.190	2.436	49	27	2.6	7.3	4.1	7.1	NA	NA	NO	0.3	0.2	0.2	0.1	0.2	0.2	0.5	
8	2.181	2.131	43	27	3.5	7.3	4.4	7.1	NA	NA	NO	0.2	0.1	0.1	0.2	0.1	0.1	0.7	
9	2.340	2.488	40	28	3.4	7.4	4.2	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.2	0.5	
	2.133	2.348	45	28	3.8	7.6	4.5	6.9	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.2	0.5	
11	2.355	2.369	43	28	3.3	7.4	4.3	7.1	NA	NA	NO	0.2	0.2	0.2	0.1	0.2	0.4	0.5	
12	2.385	2.496	49	28	4.3	7.2	4.3	7.1	NA	NA	NO	0.3	0.3	0.2	0.3	0.2	0.3	0.5	
13	2.286	2.217	45	28	3.5	7.2	4.8	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.3	0.2	
14	2.438	2.334	43	27	3.8	7.3	3.9	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.2	0.4	
15	2.397	1.693	45	27	3.5	7.3	4.6	6.9	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.1	0.5	
16	2.471	2.235	38	28	3.6	7.2	4.5	6.9	NA	NA	NO	0.1	0.1	0.2	0.3	0.1	0.1	0.5	
17	2.419	2.523	39	27	3.5	7.3	4.6	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.1	0.1	0.6	
18	2.359	2.470	34	27	3.4	7.4	4.6	7.1	NA	NA	NO	0.1	0.1	0.09	0.1	0.08	0.2	0.4	
19	2.360	2.343	40	27	3.6	7.3	4.8	7.1	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.1	1.0	
20	2.454	2.143	45	27	3.0	7.4	4.1	7.1	NA	NA	NO	0.2	0.2	0.3	0.3	0.1	0.1	1.0	
21	2.419	2.444	41	27	3.0	7.5	4.1	7.1	NA	NA	NO	0.2	0.2	0.2	0.2	0.1	0.2	0.5	
22	2.518	2.289	36	27	3.7	7.5	4.6	7.1	NA	NA	NO	0.2	0.1	0.1	0.2	0.3	0.1	0.5	
23	2.372	2.358	39	26	3.4	7.5	4.1	7.2	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.1	0.5	
24	2.374	2.395	39	26	3.4	7.4	3.9	7.0	NA	NA	NO	0.2	0.2	0.2	0.2	0.1	0.1	0.5	
25	2.239	2.303	34	27	3.2	7.4	4.1	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.1	0.2	
26	3.144	2.316	32	26	3.3	7.4	4.6	7.0	NA	NA	NO	0.3	0.2	0.2	0.1	0.1	0.1	0.5	
27	2.254	2.328	35	27	3.9	7.4	4.2	7.0	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.2	1.0	
28	2.294	2.584	32	26	4.2	7.4	4.0	7.1	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.2	0.5	
29	2.141	2.412	40	26	4.7	7.5	4.1	7.1	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	0.5	
30	2.438	2.554	31	26	3.8	7.5	4.0	7.1	NA	NA	NO	0.1	0.2	0.2	0.2	0.1	0.1	0.5	
31	2.315	2.492	33	26	4.0	7.5	3.8	7.1	NA	NA	NO	0.1	0.1	0.2	0.2	0.1	0.1	0.4	
tal	76.718	70.750	Disinfectant No. 1: FREE Cl2																
g	2.281	2.281	Disinfectant No. 2: FREE Cl2																
	2.518	2.584	Disinfectant No. 3:																
	2.038	1.493	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

JBMITTED BY: Robert Cortinas Certificate No. and Grade: 464-58-3014 B DATE: 8/1/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

LIC WATER TEM NAME: City of Raymondville, Texas PLANT NAME OR NUMBER: Raymondville Waterworks

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

'S ID No.: 2450001 Operator's Signature: Roberto Cortinas

port for Month of: July 97 Certificate No. and Grade: 464-58-3074 B Date: 8/1/97

TREATMENT PLANT PERFORMANCE

otal number of turbidity readings: 286
umber of readings above 0.5 NTU: 0
umber of readings above 1.0 NTU: 0
o. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: ____
Maximum Allowable Turbidity level: 0.5 NTU
Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU
Minimum turbidity reported: ____ NTU
Average turbidity value: ____ NTU
Standard Deviation: ____ NTU

Was a Supplemental Operating Report for CT Determination required this month? NO Was one submitted? NO

umber of days with low CT
r less than 4.0 consecutive hours: ____
umber of days with a low CT
r more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

inimum disinfectant residual required leaving the plant: 0.2 mg/l (free) / total (circle one)

umber of days with a low residual
ss than 4.0 consecutive hours: 0
..mber of days with a low residual
r more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

inimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)
otal number of tests this month: 310
umber of readings with a low residual: 0
umber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)
Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable evels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT equirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below cceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels or two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day
**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

D No.: 2450001 Connections: 2800

em Name: City of Raymondville Tex Population: 8800

it Name lumber: Raymondville WATER works Month/Year: 6/97

TREATMENT PROCESS PARAMETERS									WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data							SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3			

COMPLIANCE DATA

E	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA							FINISHED WATER QUALITY							
					Zone 1		Zone 2		Zone 3			TURBIDITY						DISINFECTANT	
			NTU	TEMP	D1	pH1	D2	pH2	D3	pH3	SOR REQD?	NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest Residual	Time*
1	1.452	1.772	47	27	3.3	7.3	3.2	6.7	NA	NA	NO	0.4	0.4	0.2	0.1	0.1	0.1	0.5	
2	1.728	2.018	45	28	2.6	7.5	3.8	6.6	NA	NA	NO	0.3	0.3	0.2	0.3	0.4	0.4	0.5	
3	1.632	1.978	48	27	2.1	7.3	3.8	6.7	NA	NA	NO	0.4	0.3	0.1	0.1	0.1	0.2	0.2	
4	1.742	1.954	55	26	2.7	7.4	4.0	6.8	NA	NA	NO	0.2	0.2	0.1	0.1	0.5	0.4	0.2	
5	1.820	1.671	45	29	2.5	7.5	3.8	6.9	NA	NA	NO	0.1	0.2	0.3	0.2	0.3	0.4	0.2	
6	2.020	2.231	35	25	2.2	7.3	3.9	6.7	NA	NA	NO	0.3	0.1	0.3	0.4	0.3	0.4	0.2	
7	1.878	2.283	40	29	3.1	7.3	4.1	6.8	NA	NA	NO	0.3	0.3	0.2	0.2	0.3	0.1	0.2	
8	1.869	2.222	33	27	3.3	7.0	4.3	6.7	NA	NA	NO	0.2	0.2	0.1	0.1	0.3	0.3	0.2	
9	1.927	2.253	53	29	2.9	7.3	4.0	6.8	NA	NA	NO	0.3	0.2	0.2	0.3	0.4	0.5	0.5	
	1.979	2.220	45	29	3.0	7.3	4.0	6.8	NA	NA	NO	0.4	0.1	0.1	0.1	0.3	0.4	0.2	
	1.940	2.233	53	29	3.0	7.1	4.2	6.6	NA	NA	NO	0.3	0.1	0.1	0.2	0.2	0.4	0.5	
12	1.901	2.148	40	29	3.4	7.5	4.1	6.7	NA	NA	NO	0.5	0.4	0.3	0.1	0.2	0.3	0.2	
13	1.916	2.164	44	29	2.1	7.2	4.2	6.7	NA	NA	NO	0.3	0.2	0.2	0.1	0.2	0.1	0.5	
14	1.923	2.196	38	29	2.8	7.4	3.9	6.6	NA	NA	NO	0.1	0.1	0.1	0.1	0.2	0.3	0.5	
15	1.776	2.223	47	29	2.6	7.4	4.3	6.6	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.2	0.2	
16	1.943	2.254	59	28	2.3	7.4	3.9	6.7	NA	NA	NO	0.4	0.2	0.1	0.2	0.1	0.1	0.5	
17	2.108	2.203	37	29	2.5	7.4	4.1	6.5	NA	NA	NO	0.2	0.1	0.1	0.1	0.1	0.1	0.2	
18	1.832	1.589	45	29	3.1	7.2	4.1	6.6	NA	NA	NO	0.1	0.1	0.3	0.1	0.1	0.1	0.5	
19	1.591	2.552	39	29	3.8	7.3	4.6	6.6	NA	NA	NO	0.1	0.1	0.4	0.5	0.1	0.1	0.5	
20	1.790	2.272	38	29	2.8	7.3	3.9	6.6	NA	NA	NO	0.1	0.1	0.2	0.2	0.3	0.2	0.2	
21	1.653	2.047	32	28	3.5	7.3	4.0	7.0	NA	NA	NO	0.1	0.2	0.2	0.1	0.1	0.1	0.5	
22	1.751	2.044	30	29	3.6	7.3	4.0	7.0	NA	NA	NO	0.1	0.08	0.07	0.1	0.2	0.1	0.2	
23	1.621	1.896	44	29	4.1	7.2	4.5	6.9	NA	NA	NO	0.09	0.06	0.06	0.1	0.1	0.2	0.5	
24	1.429	1.847	44	28	4.3	7.2	4.8	6.9	NA	NA	NO	0.1	0.08	0.1	0.1	0.1	0.1	0.5	
25	1.501	1.810	30	28	3.9	7.4	4.5	7.1	NA	NA	NO	0.1	0.1	0.1	0.2	0.1	0.1	0.2	
26	1.469	1.885	43	29	3.9	7.4	4.4	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.1	0.2	0.5	
27	1.450	1.772	30	28	4.2	7.4	4.5	7.0	NA	NA	NO	0.1	0.1	0.1	0.2	0.2	0.1	0.2	
28	1.608	2.014	28	28	3.7	7.3	4.5	7.0	NA	NA	NO	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
29	1.624	2.006	30	27	3.9	7.4	4.4	7.0	NA	NA	NO	0.2	0.2	0.1	0.1	0.2	0.2	0.5	
30	1.927	2.280	37	28	3.3	7.2	4.2	7.0	NA	NA	NO	0.2	0.2	0.2	0.1	0.1	0.1	0.5	
31																			
1	52.806	62.020	Disinfectant No. 1: FREE CL2																
2	1.760	2.067	Disinfectant No. 2: FREE CL2																
	2.108	2.283	Disinfectant No. 3:																
	1.429	1.589	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

SUBMITTED BY: Roland Cortinas Certificate No. and Grade: 64-58-3074 B DATE: 7/1/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

BLIC WATER STEM NAME: City of Raymondville, Tex

PLANT NAME OR NUMBER: Raymondville Waterwor

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

VS ID No.: 2450001

Operator's Signature: Roberto Salinas

port for a Month of: Jun-e 97

Certificate No. and Grade: 464-58-3074 B

Date: 7/1/97

TREATMENT PLANT PERFORMANCE

otal number of turbidity readings: 180

Number of 4-hour periods when plant was off-line: 0

lumber of readings above 0.5 NTU: 1

lumber of readings above 1.0 NTU: 0

Maximum Allowable Turbidity level: 0.5 NTU

lo. of days with values above 5.0 NTU: 0 (1)

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

Was a Supplemental Operating Report for CT Determination required this month? NO

Was one submitted? NO

lumber of days with low CT or less than 4.0 consecutive hours: ____

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

lumber of days with a low CT or more than 4.0 consecutive hours: ____ (3)

Minimum disinfectant residual required leaving the plant: 0.2 mg/l (free) / total (circle one)

lumber of days with a low residual less than 4.0 consecutive hours: 0

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

umber of days with a low residual or more than 4.0 consecutive hours: 0 (4)

DISTRIBUTION SYSTEM

Minimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

Total number of tests this month: 300

Percentage of readings which had low residuals this month: 0 % (5A)

Number of readings with a low residual: 0

Percentage of readings which had low residuals last month: 0 % (5B)

Number of readings with no detectable residual: ____

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable levels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT requirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below acceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels for two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

D No.: 2450001 Connections: 2800

em Name: City of Raymondville, Tex Population: 8800

it Name Number: Raymondville Water Works Month/Year: MAY 97

TREATMENT PROCESS PARAMETERS								WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data: Temp	D1	pH1	D2	pH2	D3	pH3	SOR REQD?	Turbidity Limit	Residual Limit

E	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES NTU	TEMP	DISINFECTION PROCESS DATA Zone 1 D1	pH1	Zone 2 D2	pH2	Zone 3 D3	pH3	SOR REQD?	FINISHED WATER QUALITY TURBIDITY NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	DISINFECTANT Lowest Residual	Time*
1	1.281	2.081	46	24	2.6	7.9	2.4	7.0	ND	ND	ND	0.2	0.1	0.1	0.1	0.2	0.1	0.5	
2	1.440	1655	52	25	3.0	7.9	2.9	7.1	NO	NO	NA	0.2	0.1	0.1	0.3	0.2	0.3	0.5	
3	1.364	1.857	53	24	3.0	7.7	2.9	7.1	NO	NO	NA	0.3	0.2	0.1	0.1	0.1	0.1	1.0	
4	1.363	1803	53	26	3.4	7.9	3.0	7.1	NO	NO	NA	0.2	0.2	0.2	0.3	0.1	0.3	0.5	
5	1.548	2028	40	25	3.8	7.6	2.8	7.1	NO	NO	NA	0.5	0.4	0.3	0.2	0.1	0.3	0.5	
6	1.515	1.864	50	26	4.7	7.9	3.8	7.3	NO	NO	NA	0.3	0.2	0.1	0.2	0.1	0.2	1.0	
7	1.477	1.792	50	24	3.8	7.9	3.8	7.3	NO	NO	NA	0.3	0.3	0.2	0.2	0.2	0.2	1.0	
8	1.153	1.638	37	24	3.2	8.1	2.9	7.3	NO	NO	NA	0.2	0.2	0.3	0.3	0.2	0.3	0.5	
9	1.440	1.850	56	26	3.2	7.9	3.4	7.2	NO	NO	NA	0.3	0.2	0.2	0.3	0.2	0.1	0.5	
	1029	1.381	50	22	3.9	7.5	3.5	7.0	NO	NO	ND	0.2	0.2	0.3	0.5	0.4	0.1	0.5	
11	1.044	1.581	51	22	3.9	7.7	3.4	7.0	NO	NO	NA	0.09	0.1	0.1	0.1	0.4	0.1	0.2	
12	1.444	1.768	53	23	3.1	7.8	3.2	6.9	NO	NO	NA	0.1	0.1	0.2	0.2	0.1	0.1	0.5	
13	1.166	1.523	60	23	2.5	7.7	3.1	6.9	NO	NO	NA	0.2	0.2	0.2	0.1	0.3	0.3	1.0	
14	1.413	1.444	69	24	4.0	7.6	4.0	6.8	NO	NO	ND	0.4	0.1	0.1	0.1	0.2	0.2	0.5	
15	1.336	1.734	54	26	4.3	7.4	3.9	6.7	NO	NO	NA	0.2	0.2	0.2	0.1	0.4	0.3	0.5	
16	1.199	1.820	52	24	3.8	7.4	3.6	6.8	NO	NO	ND	0.2	0.2	0.1	0.1	0.1	0.1	0.2	
17	1.151	1.652	54	24	3.4	7.5	3.4	6.7	NO	NO	NA	0.1	0.1	0.2	0.2	0.1	0.2	0.5	
18	1.168	1.597	51	26	3.4	7.5	3.4	6.8	NO	NO	NA	0.2	0.1	0.1	3.2	0.2	0.3	0.5	
19	1.446	2.050	57	27	3.4	7.4	3.5	6.7	NO	NO	NA	0.2	0.1	0.1	0.1	0.2	0.2	1.0	
20	1.155	1.634	47	25	2.4	7.5	3.5	6.7	NO	NO	NA	0.2	0.1	0.2	0.2	0.1	0.1	1.0	
21	1.174	1.666	70	25	2.5	7.5	3.5	6.8	NO	NO	NA	0.1	0.1	0.2	0.3	0.1	0.3	0.5	
22	1.148	1.705	43	29	3.3	7.5	3.9	6.8	NO	NO	NA	0.1	0.1	0.2	0.2	0.2	0.2	0.5	
23	1.139	1.736	41	24	3.3	7.5	4.2	6.8	NO	NO	NA	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
24	1.148	1.726	71	26	3.0	7.5	3.7	7.0	NO	NO	NA	0.1	0.1	0.1	0.3	0.2	0.1	0.5	
25	1.291	1.769	79	27	2.8	7.5	3.5	6.9	NO	NO	NA	0.1	0.1	0.1	0.2	0.4	0.3	0.2	
26	1.447	1.717	74	27	3.1	7.4	3.6	6.8	NO	NO	NA	0.1	0.1	0.3	0.2	0.2	0.4	0.5	
27	1.496	1.893	58	28	2.7	7.4	4.0	6.9	NO	NO	ND	0.4	0.2	0.1	0.2	0.3	0.2	0.5	
28	1.277	1.763	51	28	2.8	7.5	4.3	6.8	NO	NO	NA	0.2	0.2	0.1	0.1	0.2	0.1	0.5	
29	1.452	1.901	46	27	3.0	7.2	3.9	6.6	NO	NO	NA	0.1	0.1	0.2	0.3	0.4	0.3	1.0	
30	1.488	2.043	44	27	2.0	7.2	3.5	6.6	NO	NO	NA	0.3	0.3	0.1	0.2	0.3	0.3	0.2	
31	1.476	1.865	48	28	3.0	7.3	3.7	6.7	NO	NO	NA	0.2	0.1	0.1	0.3	0.2	0.1	0.5	
tal	40.368	54.976																	
E	1.302	1.773																	
	1.548	2.081																	
	1.029	1.381																	

Disinfectant No. 1: FREE Clz

Disinfectant No. 2: FREE Clz

Disinfectant No. 3:

Distribution Disinfectant:

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

JBMITTED BY: Kenneth Martinez Certificate No. and Grade: 464-58-3074 B-Surface DATE: 6/2/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

IC WATER EM NAME: City of Raymondville, Texas

PLANT NAME OR NUMBER: Raymondville Water Work

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

3 ID No.: 2450001

ort for Month of: MAY 97

Operator's Signature: Roberto Contreras

Certificate No. and Grade: B-SUF. 464-58-3074 Date: 6/2/97

TREATMENT PLANT PERFORMANCE

tal number of turbidity readings: 186

mber of readings above 0.5 NTU: 0

mber of readings above 1.0 NTU: 0

. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

as a Supplemental Operating Report for CT Determination required this month? NO Was one submitted? NO

mber of days with low CT r less than 4.0 consecutive hours: ____

mber of days with a low CT r more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

inimum disinfectant residual required leaving the plant: 0.2 mg/l (free) / total (circle one)

umber of days with a low residual s than 4.0 consecutive hours: 0

ber of days with a low residual r more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

linimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

otal number of tests this month: 8

umber of readings with a low residual: 0

umber of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable evels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT equirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below cceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels or two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR SURFACE WATER TREATMENT PLANTS (cont)

) No.: 2450001 — Connections: 2800

em Name: City of Raymondville, Texas — Population: 8800

it Name / lumber: Raymondville Water Works — Month/Year: APRIL 97

TREATMENT PROCESS PARAMETERS									WATER QUALITY LIMITS	
Peak Flow (MGD)	Disinfection Process Data							SOR REQD?	Turbidity Limit	Residual Limit
	Temp	D1	pH1	D2	pH2	D3	pH3			

E	COMPLIANCE DATA											FINISHED WATER QUALITY							
	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES		DISINFECTION PROCESS DATA							TURBIDITY						DISINFECTANT	
					Zone 1		Zone 2		Zone 3		SOR REQD?	NTU1	NTU2	NTU3	NTU4	NTU5	NTU6	Lowest Residual	Time*
			NTU	TEMP	D1	pH1	D2	pH2	D3	pH3									
1	1.169	1.493	40	21	4.4	7.6	3.6	7.1	NO	NO	NA	0.3	0.1	0.1	0.1	0.1	0.2	0.5	
2	1.167	1.319	41	22	3.7	7.7	3.3	7.0	NO	NO	NA	0.2	0.09	0.08	0.1	0.1	0.2	1.0	
3	1.124	1.385	42	22	3.1	7.7	3.0	7.0	NO	NO	NA	0.1	0.1	0.1	0.1	0.2	0.2	0.5	
4	1.135	1.386	43	22	3.5	7.7	3.3	7.0	NO	NO	NA	0.2	0.1	0.2	0.1	0.3	0.3	1.0	
5	1.271	1.854	38	22	3.6	7.9	3.4	7.2	NO	NO	NA	0.2	0.1	0.1	0.1	0.2	0.2	0.5	
6	1.095	1.612	43	23	3.7	7.8	3.5	7.0	NO	NO	NA	0.1	0.1	0.1	0.2	0.1	0.1	0.5	
7	1.185	1.764	34	22	3.5	7.8	3.5	7.0	NO	NO	NA	0.2	0.1	0.1	0.2	0.1	0.1	1.0	
8	1093	1.394	32	23	4.1	7.8	3.9	7.0	NO	NO	NA	0.2	0.1	0.1	0.1	0.2	0.1	0.5	
9	1.144	1.503	37	23	4.6	7.8	3.7	6.9	NO	NO	NA	0.1	0.1	0.09	0.1	0.1	0.2	1.0	
10	1.059	1.369	37	23	3.7	7.8	3.4	6.9	NO	NO	NA	0.1	0.1	0.1	0.2	0.2	0.2	0.5	
11	1.152	1.656	43	23	3.0	7.8	3.4	6.9	NO	NO	NA	0.1	0.2	0.2	0.2	0.1	0.1	0.5	
12	1.041	1.363	34	21	4.5	7.8	3.6	6.8	NO	NO	NA	0.1	0.1	0.1	0.1	0.1	0.2	1.0	
13	1013	1.351	34	20	5.0	7.8	3.8	6.9	NO	NO	NA	0.1	0.1	0.1	0.1	0.1	0.1	1.0	
14	.997	1.355	31	20	4.3	7.9	3.6	7.0	NO	NO	NA	0.1	0.1	0.1	0.08	0.08	0.06	1.0	
15	1.131	1.448	36	21	4.3	8.1	3.2	7.2	NO	NO	NA	0.07	0.1	0.1	0.1	0.09	0.1	0.5	
16	1.057	1.367	30	20	3.8	8.1	3.0	7.2	NO	NO	NA	0.1	0.1	0.2	0.1	0.1	0.1	0.5	
17	1.107	1.350	32	20	4.0	8.1	3.4	7.3	NO	NO	NA	0.1	0.1	0.1	0.1	0.2	0.1	1.0	
18	1.017	1.317	31	20	3.8	8.1	3.3	7.3	NO	NO	NA	0.1	0.1	0.1	0.09	0.1	0.2	1.0	
19	1.127	1.749	33	21	4.1	8.2	3.3	7.3	NO	NO	NA	0.1	0.1	0.1	0.1	0.1	0.3	0.5	
20	1.153	1.490	37	22	3.5	8.0	3.5	7.3	NO	NO	NA	0.2	0.1	0.1	0.1	0.2	0.3	1.0	
21	1.188	1.925	36	22	3.7	7.7	3.2	7.1	NO	NO	NA	0.2	0.2	0.1	0.1	0.1	0.2	1.0	
22	1.330	1.794	37	24	3.0	7.6	3.2	7.0	NO	NO	NA	0.2	0.1	0.1	0.1	0.09	0.09	0.5	
23	1.157	1.677	22	22	3.5	7.7	3.0	6.8	NO	NO	NA	0.1	0.09	0.1	0.1	0.1	0.1	1.0	
24	1.257	1.740	33	23	4.3	7.9	4.0	6.9	NO	NO	NA	0.1	0.1	0.1	0.1	0.2	0.2	0.5	
25	1.219	1.818	48	22	3.9	7.8	3.7	6.9	NO	NO	NA	0.1	0.09	0.08	0.1	0.09	0.2	0.2	
26	1.156	1.867	44	20	3.5	7.8	3.4	6.9	NO	NO	NA	0.1	0.1	0.1	0.09	0.1	0.1	0.5	
27	1.080	1.554	44	20	4.0	7.7	3.4	6.9	NO	NO	NA	0.1	0.1	0.1	0.1	0.1	0.1	0.5	
28	1.151	1.600	43	20	4.2	8.0	3.5	7.0	NO	NO	NA	0.1	0.1	0.1	0.1	0.1	0.2	1.0	
29	1.425	1.938	42	21	2.7	8.6	3.0	7.1	NO	NO	NA	0.1	0.1	0.1	0.2	0.3	0.1	0.5	
30	1.409	1.814	46	23	3.3	7.9	3.0	7.1	NO	NO	NA	0.1	0.1	0.1	0.3	0.3	0.1	1.0	
31																			
tal	34.608	46.652	Disinfectant No. 1: FREE CL2																
g	1.153	1.555	Disinfectant No. 2: FREE CL2																
	.425	1.938	Disinfectant No. 3:																
	1.017	1.317	Distribution Disinfectant:																

* NOTE: ONLY use the time column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.

BMITTED BY: Richard Gutierrez — Certificate No. and Grade: 4668-58-3074-B — DATE: 5/1/97

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

WATER UTILITIES DIVISION

MONTHLY OPERATIONAL REPORT FOR PUBLIC WATER SYSTEMS WHICH ARE USING SURFACE WATER SOURCES OR GROUNDWATER SOURCES WHICH ARE UNDER THE INFLUENCE OF SURFACE WATER

BLIC WATER STEM NAME: City of Raymondville, Texas

PLANT NAME OR NUMBER: Raymondville Waterworks

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, the information is true, complete, and accurate.

VS ID No.: 2450001

Operator's Signature:

:port for e Month of: APRIL 97

Certificate No. and Grade: 46458-3074 - B

Date: 5/1/97

TREATMENT PLANT PERFORMANCE

otal number of turbidity readings: 180

lumber of readings above 0.5 NTU: 0

lumber of readings above 1.0 NTU: 0

lo. of days with values above 5.0 NTU: 0 (1)

Number of 4-hour periods when plant was off-line: 0

Maximum Allowable Turbidity level: 0.5 NTU

Percentage of readings above this limit: 0 % (2)

Optional Turbidity Data

Maximum turbidity reported: ____ NTU

Minimum turbidity reported: ____ NTU

Average turbidity value: ____ NTU

Standard Deviation: ____ NTU

Was a Supplemental Operating Report for CT Determination required this month? NO

Was one submitted? NO

lumber of days with low CT or less than 4.0 consecutive hours: ____

lumber of days with a low CT or more than 4.0 consecutive hours: ____ (3)

Number of days when the plant was on-line but all the Disinfection Process Data was not collected: ____

linimum disinfectant residual required leaving the plant: 0.2 mg/l (free) / total (circle one)

lumber of days with a low residual less than 4.0 consecutive hours: 0

lber of days with a low residual or more than 4.0 consecutive hours: 0 (4)

Number of days when the disinfectant residual leaving the plant was not properly monitored: 0

DISTRIBUTION SYSTEM

linimum disinfectant residual required in the distribution system: 0.2 mg/l (free) / total (circle one)

otal number of tests this month: 300

lumber of readings with a low residual: 0

Number of readings with no detectable residual: 0

Percentage of readings which had low residuals this month: 0 % (5A)

Percentage of readings which had low residuals last month: 0 % (5B)

PUBLIC NOTIFICATION

TREATMENT TECHNIQUE VIOLATIONS	Yes/No	If YES, date when notice was given to the: Commission*	Customers**
Were any days with a turbidity reading above 5.0 NTU? - see (1) above	NO		
Were more than 5.0% of the turbidity readings above acceptable levels? - see (2) above	NO		
Were there any periods when the plant failed to meet the CT requirements for more than 4.0 consecutive hours? - see (3) above	NO		
Were there any periods when the residual leaving the plant fell below acceptable levels for more than 4.0 consecutive hours? - see (4) above	NO		
Did the residual in the distribution system fall below acceptable levels for two months in a row? - see (5A) and (5B) above	NO		

* Due by the end of the next business day

**Copies of each Public Notice must accompany this report

Submit Report to the TNRCC/Water Utilities Division (MC-155), P.O. Box 13087, Austin, TX 78711-3087 by the 15th of the month following the reporting period

WATER TANK INSPECTION, INC.

3782 DOUGLAS FIR ROAD/ JOPLIN, MO. 64804/ 417-659-8966

SYSTEM NAME: Raymondville, Tx. CONTACT: Yogi
STREET: TITLE: City Mgr.
CITY: Raymond STATE: Texas PHONE: 689-3669
ZIP CODE: FAX:
DATE: 3-5-98

TANK LOCATION: (park)
TYPE OF TANK: welded sphere
DIAMETER: HEIGHT: 100' VOLUME: 200000gal

CONDITION OF PROTECTIVE COATING:(4=GOOD, 3=FAIR, 2=POOR, 1=BAD)

EXTERIOR	RATING	SIZE	EXPLANATION
FOUNDATION	4		
LEGS	2		a lot of chipping and minimal rust
RISER	4	10"	
HATCH			
STRUTS			
SWAY RODS			
NEEDLE RODS			
OVERFLOW	3	8"	
LADDER	2		loosing a lot of paint and no safety device
BOWL	3		
SHELL	3		thinning in areas
ROOF MANWAY	4	24"&30"	
SHELL MANWAY	4	12"x18"	
CATWALK			
VENTS	4	16"	
ROOF	2-3		chalking, blistering, and peling in areas

INTERIOR	RATING	SIZE	EXPLANATION
WATER QUALITY	4		
CEILING	4		
SHELL	4		
FLOOR	4		
BEAMS	4		
LADDER	4		

COMMENTS: the exterior is in need of a new coat of paint. the interior looks to be in real good shape

TYPE of COATING :

WATER TANK INSPECTION, INC.

BY: Jason K. Rowland TITLE: Inspector DATE: 3-4-98

15 Apr 98

WATER TANK INSPECTION, INC.

3782 DOUGLAS FIR ROAD/ JOPLIN, MO. 64804/ 417-659-8966

SYSTEM NAME: Raymondville, Tx. CONTACT: Yogi
STREET: TITLE: City Mgr.
CITY: Raymond STATE: Texas PHONE: 689-3669
ZIP CODE: FAX:
DATE: 3-5-98

TANK LOCATION: prison
TYPE OF TANK: welded elevated
DIAMETER: HEIGHT: 160' to bot VOLUME: 150000gal

CONDITION OF PROTECTIVE COATING:(4=GOOD, 3=FAIR, 2=POOR, 1=BAD)

EXTERIOR	RATING	SIZE	EXPLANATION
FOUNDATION	4		
LEGS	4		
RISER	4	30"	
HATCH	4	18"x24"	
STRUTS	4		
SWAY RODS	4		
NEEDLE RODS	3		
OVERFLOW	3	6"	not flapped or angled properly
LADDER	2		safety device is loose loosing paint on topside of rungs
BOWL	4		
SHELL	4		
ROOF MANWAY	3	30"	not locked
SHELL MANWAY	4	20"	
CATWALK	2-3		some bleeding and minor blistering
VENTS	2	24"	does not have the correct screen
ROOF	3		some chalking of the paint

INTERIOR	RATING	SIZE	EXPLANATION
WATER QUALITY	3		
CEILING	4		minor bleeding on the seams
SHELL	4		
FLOOR	4		minimal sediment
BEAMS			
LADDER	4		

COMMENTS: overall this tank is in good shape

TYPE of COATING :

WATER TANK INSPECTION, INC.

BY: Jason K. Rowland TITLE: Inspector DATE: 3-4-98

15 Apr 98

1998

WATER TANK INSPECTION, INC.

3782 DOUGLAS FIR ROAD/ JOPLIN, MO. 64804/ 417-659-8966

SYSTEM NAME: Raymondville, Tx. CONTACT: Yogi
STREET: TITLE: City Mgr.
CITY: Raymond STATE: Texas PHONE: 689-3669
ZIP CODE: FAX:
DATE: 3-5-98

TANK LOCATION: school
TYPE OF TANK: welded elevated
DIAMETER: HEIGHT: 80' to bott VOLUME: 200,000

CONDITION OF PROTECTIVE COATING: (4=GOOD, 3=FAIR, 2=POOR, 1=BAD)

EXTERIOR	RATING	SIZE	EXPLANATION
FOUNDATION	4		
LEGS	1		almost no paint, and minimal rust and chipping
RISER	1	36"	several leaks in riser, some rust as well
HATCH	2	12"x16"	must have a 24" hatch on that size of riser
STRUTS	2-3		rusting badly at the top
SWAY RODS	2-3		rusting badly at the top
NEEDLE RODS	2-3		rusting badly at the top
OVERFLOW	3	6"	
LADDER	1		no safety device, and rusting on the rungs
BOWL	2-3		missing some paint
SHELL	3		minimal chipping
ROOF MANWAY	1	24"	rusted out and not 30"
SHELL MANWAY			
CATWALK	2-3		a lot of thinning and pooling, and seperation on the railing
VENTS	1	12"	rusting out
ROOF	3		

INTERIOR	RATING	SIZE	EXPLANATION
WATER QUALITY	4		
CEILING	3		some bleeding and surface rust
SHELL	1-2		a lot of blistering
FLOOR	2		a lot of sediment and blistering
BEAMS			
LADDER	2		bolts are rusting out and blistering

COMMENTS: the exterior needs to be recoated as soon as funds alow to prevent further damage to the tank
the interior looks about like the exterior

TYPE of COATING :

WATER TANK INSPECTION, INC.

BY: Jason K. Rowland TITLE: Inspector DATE: 3-5-98

15 Apr 98

Water Main Cost Estimates - Raymondville, Texas

Piping Costs

Diameter	Material Specification	Unit Quantity	Matrial Unit Cost	Installation Cost @ 25% material cost	Total Cost
6 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$15,500.00	$3,875.00	$19,375.00
8 Inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$22,000.00	$5,500.00	$27,500.00
10 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$27,500.00	$6,875.00	$34,375.00
12 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$34,500.00	$8,625.00	$43,125.00
14 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$43,500.00	$10,875.00	$54,375.00
16 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$51,500.00	$12,875.00	$64,375.00
18 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$65,500.00	$16,375.00	$81,875.00
20 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$74,000.00	$18,500.00	$92,500.00
24 inch	Ductile Iron Pipe Cement lined (min 1000 ft)	1000 ft	$83,000.00	$20,750.00	$103,750.00

Fittings

Diameter	Material Specification	Unit Quantity	Matrial Unit Cost	Installation Cost @ 25% material cost	Total Cost
	Ductile Iron	1 pound	$2.00	$0.50	$2.50

Improvements to Address Existing Deficiencies
(shown in red on figure 6-1 of report)

16" Main

Segment No.	Length (ft)	Unit cost	Cost
1	1600	$64	$103,000
Subtotal			$103,000

12" Main

Segment No.	Length (ft)	Unit cost	Cost
1	1500	$43	$64,688
2	400	$43	$17,250
3	2500	$43	$107,813
4	2000	$43	$86,250
5	4000	$43	$172,500
6	2700	$43	$116,438
7	4800	$43	$207,000
8	3700	$43	$159,563
9	6600	$43	$284,625
10	2500	$43	$107,813
11	1700	$43	$73,313
12	1200	$43	$51,750
Subtotal	33600		$1,449,000
Total			$1,552,000
Eng. & Cont.			$465,600 30%
TOTAL			$2,100,000

Short-term Growth and Deficiency Improvements
(shown in purple on figure 6-1 of report)

16" Main

Segment No.	Length (ft)	Unit cost	Cost
1	650	$64	$41,844
2	2700	$64	$173,813
3	2700	$64	$173,813
4	2700	$64	$173,813
Subtotal	8750		$563,281

12" Main

Segment No.	Length (ft)	Unit cost	Cost
1	3600	$43	$155,250
2	2700	$43	$116,438
3	2700	$43	$116,438
4	4300	$43	$185,438
5	4200	$43	$181,125
6	2700	$43	$116,438
7	2700	$43	$116,438
8	2700	$43	$116,438
9	1000	$43	$43,125
10	2700	$43	$116,438
11	2700	$43	$116,438
12	2700	$43	$116,438
13	2700	$43	$116,438
14	1300	$43	$56,063
15	1700	$43	$73,313
16	2700	$43	$116,438
17	3900	$43	$168,188
Subtotal	47000		$2,026,875
Total			$2,590,156
Eng & Cont.			$777,047 30%
TOTAL			$3,400,000

Intermediate-term Growth
(shown in blue on figure 6-1 of report)

16" Main

Segment No.	Length (ft)	Unit cost	Cost
1	5300	$64	$341,188
2	3400	$64	$218,875
3	2800	$64	$180,250
4	3400	$64	$218,875
5	3900	$64	$251,063
6	3950	$64	$254,281
7	5400	$64	$347,625
8	5350	$64	$344,406
9	2550	$64	$164,156
10	3950	$64	$254,281
11	3450	$64	$222,094
12	2200	$64	$141,625
13	2650	$64	$170,594
Subtotal	48300		$3,109,313

12" Main

Segment No.	Length (ft)	Unit cost	Cost
1	1400	$43	$60,375
2	1500	$43	$64,688
3	1700	$43	$73,313
4	2700	$43	$116,438
5	2550	$43	$109,969
6	2550	$43	$109,969
7	2550	$43	$109,969
8	2550	$43	$109,969
9	1400	$43	$60,375
10	2700	$43	$116,438
11	3900	$43	$168,188
12	2700	$43	$116,438
13	3300	$43	$142,313
14	1400	$43	$60,375
15	4700	$43	$202,688

16	2000	$43	$86,250	
17	3400	$43	$146,625	
18	3600	$43	$155,250	
19	3350	$43	$144,469	
20	1950	$43	$84,094	
21	2200	$43	$94,875	
Subtotal	54100		$2,333,063	
Total			$5,442,375	
Eng & Cont.			$1,632,713	30%
TOTAL			$7,100,000	

Long-term Growth
(shown in green on figure 6-1 of report)

16" Main

Segment No.	Length (ft)	Unit cost	Cost
1		$64	$0
2		$64	$0
3		$64	$0
4		$64	$0
Subtotal			$0

12" Main

Segment No.	Length (ft)	Unit cost	Cost
1	2800	$43	$120,750
2	2200	$43	$94,875
3	2800	$43	$120,750
4	3850	$43	$166,031
5	2800	$43	$120,750
6	3500	$43	$150,938
7	2800	$43	$120,750
8	2550	$43	$109,969
9	2800	$43	$120,750
10	2000	$43	$86,250
11	2000	$43	$86,250
12	2800	$43	$120,750
13	2700	$43	$116,438
14	2000	$43	$86,250
15	2700	$43	$116,438
16	2000	$43	$86,250
17	2700	$43	$116,438
18	1500	$43	$64,688
19	2700	$43	$116,438
20	1500	$43	$64,688
21	2500	$43	$107,813
22	1560	$43	$67,275
23	3050	$43	$131,531
24	3900	$43	$168,188
25	3900	$43	$168,188

26	3950	$43	$170,344	
27	3900	$43	$168,188	
28	3900	$43	$168,188	
29	3900	$43	$168,188	
30	8100	$43	$349,313	
31	8100	$43	$349,313	
32	5200	$43	$224,250	
33	5200	$43	$224,250	
34	5200	$43	$224,250	
35	5200	$43	$224,250	
36	5200	$43	$224,250	
37	5300	$43	$228,563	
38	5300	$43	$228,563	
39	5200	$43	$224,250	
40	2700	$43	$116,438	
41	2700	$43	$116,438	
42	5200	$43	$224,250	
43	2700	$43	$116,438	
44	2700	$43	$116,438	
45	5200	$43	$224,250	
46	8200	$43	$353,625	
47	2700	$43	$116,438	
48	2700	$43	$116,438	
49	5200	$43	$224,250	
50	2700	$43	$116,438	
51	2700	$43	$116,438	
52	3900	$43	$168,188	

Subtotal	188560	$8,131,650	
Total		$8,131,650	
Eng & Cont.		$2,439,495	30%
TOTAL		$10,600,000	

19 46	Monthly Flow			CBOD			CBOD Lbs./			TSS			TSS Lbs./ Day			H		
ONTH	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MYHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MYHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW
AN,	.568	.614	.435	8.18	11.08	5.71	41.63	57.01	29.23	14.64	18.0	9.66	74.77	92.62	54.30		7.57	7.06
EB.	.578	.680	.458	7.18	15.0	5.0	36.47	74.55	24.43	22.38	44.0	12.83	113.81	218.70	63.56		7.5	7.11
ARCH	.512	.693	.108	15.7	26.0	5.0	73.56	124.89	22.76	20.0	26.0	9.0	95.63	135.74	4098		7.7	6.0
PRIL	.605	.761	.505	10.5	14.0	7.0	56.06	77.99	33.69	16.75	27.0	9.0	87.76	113.71	44.81		7.4	7.0
AY	.716	1.232	.501	10.77	26.0	6.0	68.28	164.58	30.52	14.77	27.0	8.0	94.02	169.71	41.63		7.7	7.2
UNE	.763	.973	.460	8.33	15.0	4.0	56.74	121.72	26.78	17.0	32.0	7.0	115.38	259.67	48.22		7.5	7.0
ULY	.682	.845	.561	7.75	19.0	4.0	48.52	115.99	22.68	12.3	15.0	8.0	72.28	73.07	52.17		7.3	7.0
UGUST	.717	.893	.465	7.90	15.0	4.0	50.70	85.56	26.08	10.80	15.0	6.0	69.45	90.60	39.13		7.4	6.9
EPT.	.641	.790	517	14.87	18.0	12.0	90.61	117.31	66.89	14.87	19.0	9.0	85.65	108.54	49.53		7.4	7.2
CT.	.697	1.037	.773	10.6	17.0	5.0	62.71	77.67	32.47	18.0	34.0	6.0	104.07	211.81	37.12		7.4	7.1
OV.	.941	1,187,400	602,500	7.3	13.0	3.0	58.15	111.98	27.77	11.9	17.0	7.0	97.36	148.11	50.57		7.9	7.5
EC.	.902	1,026,500	704,200	8.63	17.0	4.0	65.24	132.61	24.42	18.36	26.0	9.0	138.63	221.18	73.04		7.7	7.6
OTAL	8.371			117.65						191.77								

1996	Monthly Flow			CBOD			CBOD Lbs./ D			TSS			TSS Lbs./ Day					
NTH	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MYHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MYHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW
N.	.811	1,019,000	.672	14.11	18.0	6.0	94.18	126.10	43.08	25.33	40.0	16.0	172.02	311.58	104.06		7.7	7.5
B.	.737	.918	.564	46.0	123.0	4.0	256	704	28.45	60.0	272.0	18.0	345.0	1558	106.41		7.7	7.4
RCH	.710	.789	.533	24.0	34.0	14.0	137.95	206.14	87.68	15.62	33.0	7.0	91.62	192.88	44.36		8.77	7.4
RIL	.695	.339	.500	26.75	53.0	15.0	158.79	348.75	96.95	16.62	30.0	12.0	98.50	155.61	73.44		7.4	7.4
Y	.725	.883	.518	21.4	43.0	12.0	135.91	280.14	62.34	10.20	12.0	7.0	64.49	90.63	43.60		7.5	7.2
NE	.703	.837	.568	13.12	27.0	5.0	74.55	145.84	28.39	8.37	18.0	4.0	47.78	90.52	22.71		7.4	7.2
LY	.665	.860	.518	10.22	19.0	6.0	55.95	100.38	32.22	11.27	27.0	4.0	66.08	91.30	20.91		7.7	7.1
GUST	.748	.775	.529	19.77	42.0	10.0	121.76	279.52	55.87	14.44	27.0	7.0	89.82	166.40	39.11		7.4	7.1
PT.	.797	1.047	.536	17.17	22.0	13.0	116.22	135.04	72.37	14.75	24.0	9.0	99.86	146.66	60.46		7.7	6.8
T.	.907	1.169	.693	14.30	20.0	5.0	10.61	153.97	41.32	17.20	26.0	11.0	132.01	220.09	71.00		7.7	7.1
V.	.970	1.154	.751	15.25	20.0	8.0	124.43	153.98	64.38	13.62	17.0	9.0	113.10	148.30	72.43		7.6	7.4
C.	.711	1.229	.665	14.62	24.0	7.0	110.25	171.13	63.63	9.0	12.0	7.0	72.89	104.12	42.50		7.6	7.3
TAL	6.189			136.66			1398.6			216.92			1394.20					

ONTH	Monthly Flow MTHLY AVG.	MTHLY HIGH	MTHLY LOW	CBOD mg/l MTHLY AVG.	MTHLY HIGH	MTHLY LOW	CBOD Lbs./Day MYHLY AVG.	MTHLY HIGH	MTHLY LOW	TSS mg/l MTHLY AVG.	MTHLY HIGH	MTHLY LOW	TSS Lbs./ Day MTHLY AVG.	MTHLY HIGH	MYHLY LOW	pH MTHLY AVG.	MTHLY HIGH	MTHLY LOW
AN.	.857	1.067	.542	20.5	30.0	13.0	154.27	248.69	88.50	11.3	17.0	8.0	84.85	131.85	62.78		7.6	7.1
EB.	.551	1.114	.201	19.87	30.0	16.0	154.73	221.17	115.02	10.12	12.0	8.0	79.12	97.90	58.11		7.7	7.3
ARCH	1.138	1.521	.611	15.12	25.0	6.0	137.11	268.13	66.20	13.12	22.0	9.0	125.54	216.78	64.15		7.6	7.2
PRIL	1.183	1.447	.938	17.22	27.0	13.0	195.87	299.45	111.45	14.33	25.0	4.0	150.44	271.05	32.19		7.6	7.2
AY	1.028	1.236	.781	12.55	17.0	10.0	115.25	157.94	87.15	12.44	20.0	9.0	106.75	185.81	73.13		7.5	7.3
UNE	.783	1.121	.364	23.0	33.0	14.0	194.38	278.62	125.40	21.75	37.0	12.0	184.03	307.03	107.48		7.4	7.0
ULY	.776	1086	.504	13.90	25.0	7.0	114.72	196.82	54.70	16.5	23.0	11.0	136.81	199.25	93.57		7.3	7.1
UGUST	.928	1.052	.780	8.5	12.0	5.0	68.73	100.78	40.44	30.37	66.0	18.0	240.25	498.69	145.61		7.4	6.6
EPT.	.864	1.110	.502	10.62	17.0	6.0	85.34	153.26	40.48	14.37	30.0	4.0	114.50	253.20	28.80		7.4	7.1
CT.	.947	1.218	.696	8.2	14.0	3.0	60.48	110.33	23.89	19.1	64.0	6.0	148.89	484.45	47.97		7.5	7.1
OV.	.789	1.025	.598	16.12	30.0	7.0	108.41	166.73	46.52	19.1	28.0	8.0	128.40	174.43	59.44		7.4	7.2
EC.	.679	.985	.466	8.90	12.0	6.0	48.73	70.85	32.37	15.60	22.0	8.0	85.56	129.90	48.97		6.9	7.8
OTAL	11.249																	

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MONTH	Monthly Flow MTHLY AVG.	MTHLY HIGH	MTHLY LOW	CBOD MTHLY AVG.	MTHLY HIGH	MTHLY LOW	CBOD Lbs/ day MYHLY AVG.	MTHLY HIGH	MTHLY LOW	TSS MTHLY AVG.	MTHLY HIGH	MTHLY LOW	TSS Lbs./ Day MTHLY AVG.	MTHLY HIGH	MYHLY LOW	pH MTHLY AVG.	MTHLY HIGH	MTHLY LOW
JAN,	.523851	.646	.276	10.80	19.42	6.29	45.76	96.70	16.57	19.41	22.8	15.50	85.76	104.59	40.86		7.62	7.3
FEB.	.593	.724	.467	8.06	11.49	4.80	39.50	53.86	25.63	17.96	23.50	13.51	88.53	114.94	60.85		7.87	7.19
MARCH	.660	.932	.467	5.22	6.89	2.34	30.56	44.90	11.71	16.58	18.17	8.84	89.02	117.30	58.40		7.83	7.01
APRIL	.670	.778	.520	7.47	15.09	4.40	42.59	74.89	23.23	15.00	16.84	13.17	86.75	99.89	69.53		7.51	7.2
MAY	.698	.812	.584	6.22	7.19	3.99	37.17	40.60	24.56	16.26	20.67	10.67	97.16	127.23	70.22		7.59	7.26
JUNE	.632	.755	.521	6.55	10.69	4.36	36.04	64.64	21.82	13.69	20.84	9.01	74.08	119.58	51.08		7.49	7.0
JULY	.631	.733	.486	6.15	8.16	4.40	33.98	47.44	22.94	15.26	20.51	10.67	84.22	113.35	54.82		7.52	7.2
AUGUST	.625	.714	.535	4.69	6.70	2.59	25.44	36.72	13.83	13.64	17.0	10.34	74.05	92.73	54.25		7.75	7.0
SEPT.	.608	.765	.472	7.70	10.73	5.84	40.99	55.04	30.30	14.69	20.5	10.34	78.25	108.57	54.23		7.41	7.02
OCT.	.620	.864	.518	7.41	10.49	5.26	39.04	53.25	27.21	12.29	17.33	7.50	65.03	102.20	44.04		7.47	7.1
NOV.	.580	.722	.452	8.38	10.71	4.44	40.56	57.38	20.69	16.81	19.16	14.83	81.43	93.71	62.16		7.68	7.2
DEC.																		
TOTAL																		

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= 9 PPM 0 1,387 ONTH LIMIT	Monthly Flow			BOD			BOD Lbs./ Day			TSS			TSS Lbs./ Day			pH		
	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MYHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW	MTHLY AVG.	MTHLY HIGH	MYHLY LOW	MTHLY AVG.	MTHLY HIGH	MTHLY LOW
AN.	.673	920 cfm 1-22-93 .747	.592	14.8	26	8.39	82	128.37	47.07	24	33.5	16.5	134.56	199.49	93.44		7.65	7.48
EB.	.670	805 cfm 2-3-93 .800	.531	9.82	13.17	5.5	56.15	74.62	30.05	19.7	26.5	16.2	113.63	176.81	88.10		7.76	7.48
ARCH	.691	.783	.543	14.98	26.4	8.45	91.88	161.83	48.14	19.7	25.0	17.8	119.21	147.00	101.99		7.60	7.47
PRIL	.678	.817	.530	8.09	9.39	6.50	49.14	60.38	37.14	17.84	22.8	13.7	107.90	146.61	88.89		7.70	7.47
AY	.858	1.321	.633	7.37	9.23	5.58	54.14	75.57	40.73	25.44	38.5	16.1	192.98	361.87	100.31		7.83	7.46
UNE	1.002	1.486	.545	6.07	9.88	1.80	46.12	62.61	19.72	20.00	26.2	13.84	160.77	215.40	114.91		7.66	7.16
ULY	.976	1.206	.775	4.51	13.2	2.94	37.15	107.45	21.17	20.8	26.3	14.5	172.72	214.08	119.47		7.74	7.53
UGUST	.758	.904	.643	5.15	12.25	1.67	32.15	65.70	11.24	17.66	19.9	12.7	115.23	133.94	95.75		7.87	7.46
EPT.	.660	.760	.506	8.0	8.75	7.24	45.60	49.77	41.43	23.53	25.1	21.95	134.18	125.59	142.77		7.45	7.29
CT.	.577	.745	.426	9.87	18.46	5.0	53.45	114.70	25.36	18.18	22.1	12.17	95.96	118.52	60.40		7.77	7.14
OV.	.589	.688	.463	9.03	11.04	6.66	47.10	56.98	31.11	17.86	20.8	12.84	90.05	110.98	67.25		7.67	7.3
EC.	.560	.686	.428	6.48	9.40	3.83	32.00	16.84	50.02	18.56	22.1	14.95	90.59	107.20	75.02		7.25	7.8
OTAL																		

Table 5.2
Proposed Lift Stations

Lift Station	Location	Deliver to	Size (in.)	Length of FM (ft)	Year
PS 31	West of US Highway 77-South of Emma Rd.	MH 10	6	1600	2003
PS 32	On Highway 490 and US Highway 77	MH 9	6	1350	2003
PS 801	On US Highway 77 and FM 3186	PS 810	12	9800	2003
PS 81	North of Saoz Ave.-West of First St.	WWTP	16	7100	2003
PS 810	On San Francisco Ave.	WWTP	16	1450	2003
PS 827	East of Spence Rd.-On Highway 186	MH 24	8	1350	2003
PS 828	East of Spence Rd.-On Highway 186	MH 25	8	2200	2003
PS 829	On King St. and Highway 186	MH 26	12	750	2003
PS 832	Block of FM 1762-First St.	MH 15	6	2200	2028
PS 802	On Thirteenth St.- South of Highway 490	MH 2/MH 3	8	2100	2028
PS 803	East of Fifteenth St.-South of Emma Ross Rd.	MH 7	6	2600	2028
PS 804	East of Fifteenth St.-South of Emma Ross Rd.	MH 8	10	2600	2028
PS 805	On Thirteenth St.- South of Highway 490	MH 4/MH 5	8	2800	2028
PS 806	East of Highway 877-South of Highway 490	MH 1	6	2450	2028
PS 809	East of US Highway	MH 14	8	2200	2028
PS 812	On Highway 490 and King St.	MH 38	8	1350	2028
PS 813	On King St.- South of FM 3168	MH 32	10	1650	2028
PS 814	On FM 3468 and King St.	MH 30	12	1400	2028
PS 816	West of King Rd.- South of Highway 490	MH 41	6	2550	2028
PS 817	East of Spence Rd.-South of Highway 490	MH 40	6	2050	2028
PS 818	East of Spence Rd.-South of Highway 490	MH 40	6	1300	2028
PS 820	West of King St.-North of Highway 490	MH 37	8	1300	2028
PS 821	East of Spence Rd. South of FM 3168	MH 36	6	1450	2028
PS 822	East of Spence Rd.-South of FM 3168	MH 31	6	650	2028
PS 823	East of Spence Rd.-South of FM 3168	MH 31	6	3300	2028
PS 824	East of Spence Rd.-On Wood Ave.	MH 28	8	1850	2028
PS 825	East of Spence Rd.-On Wood Ave.	MH 27	6	1600	2028
PS 826	On highway 186-West of Spence Rd.	MH 23	8	3350	2028
PS 830	West of First St.-South of FM 1762	MH 22	6	2000	2028
PS 833	Block of FM 1762-HWY 877	MH 16	6	1000	2028
PS 834	US 77 off ramp	MH 18	8	1450	2028
PS 835	Block of FM 1762-US 77 of ramp	MH 17	6	2050	2028
PS 836	US 77 off ramp	MH 20	6	450	2028
PS 837	1/2 block north of S. FO	MH 19	6	2050	2028
PS 838	Norh of San Francisco Ave.-South of FM 1762	MH 21	6	1300	2028
PS 807	North of FM 3168 - East of US Highway 77	MH 12	6	1450	2028
PS 808	On Gem Ave.-East of Highway 77	MH 13	8	1950	2028
PS 815	On King St. and Wood Ave.	MH 29	12	1050	2028
PS 831	On First Street-South of FM 1762	Exist. 10"	6	2200	2028

Table 5.3
Future Wastewater Collection System

Year	Line Segment (MH # - MH #)	Size	Length	Unit Cost	Unit	Total Cost
2003	PS 831- Exist 10" (San Francisco @ 1st St.)	6	2200	$9	lf	$19,800
2003	PS 827-MH 24	8	1350	$15	lf	$20,250
2003	PS 828-MH 25	8	2200	$15	lf	$33,000
2003	MH 7-MH 8	10	1800	$20	lf	$36,000
2003	PS 801-PS 810	12	9800	$25	lf	$245,000
2003	MH 23-PS 827	12	850	$25	lf	$21,250
2003	MH 24-PS 828	12	1300	$25	lf	$32,500
2003	MH 25-PS 829	12	500	$25	lf	$12,500
2003	PS 829-MH 26	12	750	$25	lf	$18,750
2003	PS 810-Exist WWTP	16	1450	$32	lf	$46,400
2003	MH 26-PS 81	16	1100	$32	lf	$35,200
2003	PS 81 to Exist WWTP	16	7100	$32	lf	$227,200
2003	MH 8-PS 801	?	1000		lf	$0
2028	PS 832-MH 15	6	2200	$9	lf	$19,800
2028	PS 833-MH 16	6	1000	$9	lf	$9,000
2028	PS 835-MH 17	6	2050	$9	lf	$18,450
2028	PS 838-MH 21	6	1300	$9	lf	$11,700
2028	PS 830-MH 22	6	2000	$9	lf	$18,000
2028	PS 837-MH 19	6	2050	$9	lf	$18,450
2028	PS 836-MH 20	6	450	$9	lf	$4,050
2028	PS 803-MH 7	6	2600	$9	lf	$23,400
2028	PS 806-MH 1	6	2450	$9	lf	$22,050
2028	PS 31-MH 10	6	1600	$9	lf	$14,400
2028	PS 32-MH9	6	1350	$9	lf	$12,150
2028	PS 816-MH 41	6	2550	$9	lf	$22,950
2028	PS 818-MH 40	6	1300	$9	lf	$11,700
2028	PS 819-MH 41	6	1300	$9	lf	$11,700
2028	PS 821-MH 36	6	1450	$9	lf	$13,050
2028	PS 817-MH 40	6	2050	$9	lf	$18,450
2028	PS 823-MH 31	6	3300	$9	lf	$29,700
2028	PS 822-MH 31	6	650	$9	lf	$5,850
2028	PS 825-MH 27	6	1600	$9	lf	$14,400
2028	PS 807-MH 12	6	1450	$9	lf	$13,050
2028	MH 15-PS 833	8	1650	$15	lf	$24,750
2028	MH 16-PS 834	8	1200	$15	lf	$18,000
2028	MH 17-PS 834	8	1550	$15	lf	$23,250
2028	MH 21-PS 830	8	1300	$15	lf	$19,500
2028	PS 834-MH 18	8	1450	$15	lf	$21,750
2028	MH 1-PS 802	8	1900	$15	lf	$28,500
2028	PS 802-MH 2	8	2100	$15	lf	$31,500
2028	PS 805-MH 4	8	2800	$15	lf	$42,000
2028	MH 9-MH 10	8	1100	$15	lf	$16,500
2028	PS 826-MH 23	8	3350	$15	lf	$50,250
2028	PS 812-MH 38	8	1350	$15	lf	$20,250
2028	MH 40-PS 819	8	1300	$15	lf	$19,500
2028	PS 820-MH 37	8	1300	$15	lf	$19,500
2028	MH 27-PS 824	8	1050	$15	lf	$15,750
2028	500' South of FM 3168-PS 807	8	1700	$15	lf	$25,500
2028	PS 808-MH 13	8	1950	$15	lf	$29,250

Table 5.3-*Continued*

2028	PS 809-MH 14	8	2200	$15	lf	$33,000
2028	MH 6-MH 7	8	2200	$15	lf	$33,000
2028	PS 824-MH 28	8	1850	$15	lf	$27,750
2028	MH 28-PS 815	8	950	$15	lf	$14,250
2028	MH 18-PS 836	10	1300	$20	lf	$26,000
2028	MH 19-PS 836	10	1500	$20	lf	$30,000
2028	MH 2-MH 3	10	900	$20	lf	$18,000
2028	PS 804-MH 8	10	2600	$20	lf	$52,000
2028	MH 41-MH 39	10	1350	$20	lf	$27,000
2028	MH 39-PS 812	10	1600	$20	lf	$32,000
2028	PS 813-MH 32	10	1650	$20	lf	$33,000
2028	MH 32-PS 814	10	1150	$20	lf	$23,000
2028	MH 36-PS 820	10	1200	$20	lf	$24,000
2028	MH 37-MH 38	10	1600	$20	lf	$32,000
2028	MH 31-PS 814	10	2850	$20	lf	$57,000
2028	MH 22-PS 81	10	2700	$20	lf	$54,000
2028	MH 12-PS 808	10	1000	$20	lf	$20,000
2028	MH 10-MH 11	10	3050	$20	lf	$61,000
2028	MH 11-PS 801	10	500	$20	lf	$10,000
2028	MH 3-PS 805	12	100	$25	lf	$2,500
2028	MH 4-MH 5	12	1150	$25	lf	$28,750
2028	MH 38-PS 813	12	1100	$25	lf	$27,500
2028	PS 814-MH 30	12	1400	$25	lf	$35,000
2028	MH 20-PS 810	12	750	$25	lf	$18,750
2028	MH 13-PS 809	12	1350	$25	lf	$33,750
2028	MH 14-PS 810	12	1500	$25	lf	$37,500
2028	PS 815-MH 29	12	1050	$25	lf	$26,250
2028	MH 5-PS 804	15	100	$30	lf	$3,000
2028	MH 29-PS 829	16	1150	$32	lf	$36,800
2028	MH 30-PS 815	18	1300	$37	lf	$48,100

Table 5.4
Proposed Manholes

YR	MH #	Total # of MH
2003	9	**6**
2003	10	
2003	11	
2003	24	
2003	25	
2003	26	
2028	1	**32**
2028	2	
2028	3	
2028	4	
2028	5	
2028	6	
2028	7	
2028	8	
2028	14	
2028	15	
2028	16	
2028	17	
2028	18	
2028	19	
2028	20	
2028	21	
2028	22	
2028	23	
2028	27	
2028	28	
2028	30	
2028	31	
2028	32	
2028	36	
2028	37	
2028	38	
2028	39	
2028	40	
2028	41	
2028	12	
2028	13	
2028	29	

Table 5.5
Summary of Wastewater System Improvements Costs

Year	Item	Quantity	Unit Cost	Unit	Total Cost
2003	Lift Station	8	$100,000	ea	$ 800,000
2003	Manhole	6	$ 1,300	ea	$ 7,800
2003	16-inch PVC Pipe	9650	$32	lf	$308,800
2003	12-inch PVC Pipe	13200	$25	lf	$330,000
2003	10-inch PVC Pipe	1800	$20	lf	$36,000
2003	8-inch PVC Pipe	3550	$15	lf	$53,250
2003	6-inch PVC Pipe	2200	$9	lf	$19,800
				Sub-Total	$1,555,650
				20 % Contingency	$ 311,130
				Total Estimated Construction Cost	$ 1,866,780

Year	Item	Quantity	Unit Cost	Unit	Total Cost
2028	Lift Station	31	$100,000	ea	$ 3,100,000
2028	Manhole	32	$ 1,300	ea	$ 41,600
2028	18-inch PVC Pipe	1300	$37	lf	$48,100
2028	15-inch PVC Pipe	1250	$30	lf	$37,500
2028	12-inch PVC Pipe	8400	$25	lf	$210,000
2028	10-inch PVC Pipe	24950	$20	lf	$499,000
2028	8-inch PVC Pipe	34250	$15	lf	$513,750
2028	6-inch PVC Pipe	34700	$9	lf	$312,300
				Sub-Total	$ 4,762,250
				20 % Contingency	$ 952,450
				Total Estimated Construction Cost	$ 5,714,700

* Adquisition right of way and administrative costs not included.

Total Estimated Construction Cost for 2003 and 2028 = $ 7,581,480

REGULATORY REQUIREMENTS

Raymondville City water system is governed by the Rules and Regulations for Public Water Systems implemented by the Texas Natural Resources Conservation Commission (TNRCC). 30 TAC §290.38 to §290.47. Relevant provisions of these regulations relative to Raymondville water system are listed in italics. The status of compliance by the City of Raymondville is briefly discussed in the following paragraphs to present minimum regulatory requirements to assist in prioritizing of capital improvement decisions and areas of need for further study.

§290.41(b) *Water Quantity. Sources of supply, both ground and surface, shall have a safe yield capable of supplying the maximum daily demands of the distribution system during extended periods of peak usage and critical hydrologic conditions.*

Major source of water supply for the City of Raymondville is the surface water supply from the Rio Grande River in accordance with the water rights possessed by the City. Delta Irrigation District conveys adjudicated quantity of water from the River to the City raw water storage ponds. The City also owned a water well that has been inactive due to high salinity and nitrate contents and hence unavailable as a water source. Melden & Hunt, Inc studied reactivation of this well in May 1996 and it was recommended that the water from the well be treated with reverse osmosis process. High cost of treatment prevented the City to implement this option.

The quantity of surface water supply from the Delta Irrigation District is sufficient at the present time and during the long term planning period (until 2028). The present study included a task to investigate alternate sources of supply to increase the reliability of supply during maximum day demands.

Raw water storage is a factor that can influence the reliability of the source water supply. City currently owns and operates four raw water storage ponds each of 3.0 million gallons capacity to a total of 12.0 MG. At the current treatment plant capacity of 2.5 mgd, these unlined storage serves for 4.8 days of average demand. At the present time, two of the ponds are almost filled with silt reducing the effective storage capacity. Additional storage requirement depends on the lengths of supply outages affected by the Delta Irrigation District. The reliability of raw water supply is jeopardized, if the District turns off supply for maintenance of its conveyance facilities.

§290.45(b)(2)(A) *a raw water pump capacity of 0.6 gallon per connection with the largest pump out of service.*

The number of connections the City served in the month of December 1998 is 2659. Therefore, firm capacity of raw water pumps is 1595 gpm. There are three raw water pumps RW Pump #1, #2, and #3 of capacities 750, 750, and 1150 gpm, respectively. Therefore, when the largest pump is out of service, the firm capacity is probably less than 1500 gpm due to system losses. Therefore, addition of an 1150-gpm raw water pump is

necessary to the raw water pumping capability. Alternatively, construction of a new raw water pump station with the required firm capacity at the proposed water treatment plant may be considered.

§290.45(d)(3) *a treatment plant capacity of 0.6 gallon per minute per connection under normal rated design flow.*

The existing plant capacity is 2.5 mgd and therefore, meets the minimum per connection capacity requirement of 2.3 mgd per TNRCC. However, section 290.45(d)(3) requires that each surface water system regardless of its size, shall provide treatment capacity for the system maximum daily demand. Further discussion on the treatment capacity is presented in paragraphs that follow.

§290.45(b)(2)(C) *transfer pumps (where applicable) with a capacity if 0.6 gallons per minute per connection with the largest pump out of service.*

High service pumps at the treatment plant are listed as follows:

High Service Pump #1	350 gpm	
High Service Pump #2	600 gpm	at 50 psi system pressure
High Service Pump #3	600 gpm	at 50 psi system pressure
High Service Pump #4	1000 gpm	at 50 psi system pressure
High Service Pump #5	2000 gpm	can be used only in high demand

Although the firm capacity of high service pumps is greater than minimum required by the regulations, available high service pumping capacity and pressure are not sufficient to provide necessary fire flows to parts of the City. Further discussion is included in distribution system analysis section.

§290.45(b)(2)(D) Covered *clearwell storage capacity at the treatment plant of 50 gallons per connection, or 5% of the daily plant capacity*

The plant clearwell capacities are 500,000, 250,000, and 90,000 gallons and are directly connected to pump #5, #3, and 1&4 respectively. The total storage capacity of all three clearwells is in excess of the minimum required storage capacity required by the TNRCC.

§290.45(b)(2)(G) *An elevated storage capacity of 100 gallons per connection.*

The City distribution system includes two elevated storage tanks of 200,000 each and one of 150,000 gallons. The smaller tank is dedicated to the prison distribution system. This available storage capacity satisfies the minimum regulatory requirement.

Existing Lift Station Characteristics

Lift Station Number	Location	Number of Pumps	Pump Horsepower	Capacity Gallons/min.	Type of Lift Station
1	Treatment Plant	2	7.5/10/15	450/500/900	W/DW
2	N. 10th & Sauz (Mel Pak)	3	5/7.5	400/450	SP
3	N. 9th & Main	1	5	400	W/DW
4	N. 10th & Main	2	5/5	400/400	W/DW
5	Kimball & 10th	2	7.5/5	450/400	SUB
6	E. Hidalgo, Dollar Store	2	5/5	400/400	SUB
7	S. 16th & Harris	2	5/5	400/400	SUB
8	Expressway & Gem	2	5/5	400/400	SUB
9	Expressway & Mall	2	5/5	400/400	SUB
10	Expressway & San Francisco	2	7/5	400/400	SUB
11	Expressway & Wood	2	5/5	400/400	SUB
12	S. Expressway	2	5/5	400/400	SUB
13	FM 3168 & 10th	2	3/5	300/400	SUB
14	9th & Monroe	2	5/5	400/400	SUB
15	S. 10th & Wood	2	5/5	400/400	SP
16	S. 3rd & Gem	2	2/5	200/400	SP
17	King & Durham	2	5/7.5	300/400	SUB
18	Hidalgo & Rail Road	2	5/7.5	400/450	W/DW & SP
19	San Francisco & 5th	2	5/5	400/400	W/DW & SP
20	Expressway & County Prison	2			

Legend: W/DW = Wet Well/Dry Well
SP = Self Priming
SUB = Submersible

Existing Lift Stations

LS1: LS1 is new and has no requirements for major repairs or improvements.

LS2: LS2 is new and has no requirements for major repairs or improvements.

LS3: LS3 has concrete corrosion. The mechanical and electrical systems are old and worn. The wet well component is located in the traffic area of the street and is difficult to maintain. The station is serviced with one pump; hence there is no redundancy in emergency conditions.

LS4: LS4 has concrete corrosion. LS3 and LS4, together, may be eliminated entirely. The two lift stations will be replaced with one new station in the same general area.

LS5: LS5 is currently being replaced. The work is not included in the improvements of this Master Plan.

LS6: LS6 is currently undergoing engineering review and may be eliminated entirely. This work is not included in the improvements of this Master Plan.

LS7: LS7 has no requirements for major repairs or improvements.

LS8: LS8 has no requirements for major repairs or improvements.

LS9: LS9 has no current requirements for major repairs or improvements. The concrete structure may need future repairs.

LS10: LS10 has an adequate concrete structure, although it may need future repairs. The mechanical system should be replaced within 5 years.

LS11: LS11 is currently under engineering study for replacement. This work is not included in the improvements of this Master Plan.

LS12: LS12 is new and has no requirements for major repairs.

LS13: The force main serving LS13 is currently under engineering study. Pending the force main selection, new pumps may be required. This work is not included in the improvements of this Master Plan.

LS14: LS14 has no requirements for major repairs or improvements.

LS15: LS15's wet well component is located in the traffic area of the street and is difficult to maintain. The station should be replaced within 5 years.

LS16: LS16's wet well component is located in the traffic area of the street and is difficult to maintain. The station should be replaced within 5 years.

LS17: LS17 has no requirements for major repairs or improvements.

LS18: LS18 has no requirements for major repairs or improvements.

LS19: LS19 has concrete corrosion and should be replaced within 5 years.

LS20: LS20 has no requirements for major repairs or improvements.

Task 3.17 Water Conservation Plan

3.17.1 Scope

Task 3.17 of the Scope of Services states the following:
"A water conservation and emergency water demand management plan will be prepared according to Texas Water Development Board requirements". Water conservation plan is presented in paragraph 3.17.2 of this section. Discussion on emergency water demand management plan and associated capital improvements are presented in paragraphs 4.4.7 and 6.2.1 of this Master Plan.

3.17.2 Water Conservation Plan

City of Raymondville water conservation program focuses on the objective of reducing water consumption in the service area. Water conservation measures can extend the time period in which additional water and wastewater treatment capacity must be provided to the service area. In addition, a benefit of water conserved is associated with the reduction in amount of wastewater needing treatment and disposal and hence lowers operation costs.

The following eleven water conservation methods are delineated as part of the proposed water conservation plan. These are discussed in detail in the following paragraphs.

3.17.2.1 Education and Information

This is the most readily available and low cost method of promoting water conservation to inform the customers of water saving measures inside of their homes, yards, lawns, and other buildings. There are several brochures and other educational materials available through American Water Works Association (AWWA), Environmental Protection Agency (EPA) and Texas Water Development Board (TWDB). An effective program of distribution of materials can be developed to coincide with the high water demand summer periods can be designed.

3.17.2.2 Conservation Oriented Water Rate Structure

An effective rate structure that includes a lower rate for the first 10,000 gallons followed by a premium rate for every 1,000 gallons over and above the base amount would encourage the customers to limit their consumption to the base amount. City of Raymondville conducted a water rate study that recommended in an overall increase in water rates.

3.17.2.3 Meter Testing, Repair and Replacement

TWDB recommends a meter maintenance program that includes annual testing and replacement all meters larger than 1½ inches. A replacement of all meters - 1½ inches and smaller - every 10 years coupled with computerized billing and leak detection program is an effective way to minimize water loss. The universal metering concept, which requires metering of all water users including all public service connections, promotes integrity of leak detection and loss monitoring program.

3.17.2.4 Water Audits and Leak Detection

A continuous leak detection and repair program is key to minimizing unaccounted for system water losses. Through the billing program, the City of Raymondville should audit billings to identify excessive usage and then take steps to identify and repair if there is a source for leak.

3.17.2.5 Periodic Review and Evaluation

A periodic review program to evaluate the effectiveness of the conservation plan, at least biannually, will be required to identify if there is an evidence of an increased system loss or if there is a pattern of increased per capita usage.

3.17.2.6 Water Conserving Landscaping

An information and education program promoting the following garden watering practices will encourage customers to incorporate water saving practices.

- Xeriscaping landscape programs
- The use of drip irrigation systems and sprinklers that are designed with water conservation in mind.
- Design of ornamental fountains that use minimal quantities of water and include water recycling.
- Use of drought resistant plants and grasses efficient watering devices.
- Establish a landscape water audit program, demonstration gardens and related programs.
- Identify other outdoor conservation practices such as covering pools and spas to reduce evaporation.

3.17.2.7 Distribution System Pressure Control

Though not applicable to Raymondville distribution system, an evaluation of excessive pressures in areas of distribution system and reducing pressures to lower values can help a utility minimize water leaks, lower mechanical stress on pipe joints, and appliances and improve life of the equipment. Reduced operating pressures will also reduce operating costs of the utility operation.

3.17.2.8 Recycling and Reuse

Conversion of customers that currently use fresh water to treated wastewater effluent is known as water reclamation program. Potential applications of reclaimed water include industries that use large quantities of fresh water for cooling towers, golf courses and lawn irrigation systems.

3.17.2.9 Water Conservation Retrofit Program

An aggressive retrofit program can have dramatic impact on water system demands. Some of the free retrofit features may include low flow showerheads, toilet bags, dye tablets for leak detection in toilet flush, and toilet dams. Toilet bags and low flow showerheads are proven to be popular and are well received in several cities that offered these options to their customers.

3.17.2.10 Plumbing Code Water Conservation

Legislation, passed by the 72nd Texas Legislature, requires that plumbing fixtures sold in Texas after January 1, 1992 must meet the following standards.

- Showers shall be equipped with approved flow control devices to limit total flow to a maximum of 2.75 gpm at 80 psi of pressure.
- Sink faucets shall deliver water at a reduced rate not to exceed 2.2 gpm at 60 psi of pressure.
- Wall mounted Flushometer toilets shall use a maximum of 2.0 gallons per flush.
- All other toilets shall use a maximum of 1.6 gallons per flush.
- Urinals shall use a maximum of 1.0 gallons per flush.
- Drinking water fountains must be self-closing.

3.17.2.11 Implementation and Enforcement

The City of Raymondville can develop a new implementation and enforcement plan by adopting the following measures.

- Water service taps will not be provided to customers unless they meet the plan requirements;
- The adoption of rate structure that will encourage retrofitting of old plumbing fixtures that use large quantities of water; and
- Withhold meter installation to new construction that fails to meet plan requirements.

Task 4.14 Sludge Management Plan

4.14.1 Scope

Task 4.14 of the Scope of Services states the following:
"The current sludge management plan will be reviewed to check compliance with the RCRA Section 503 regulations and related capital improvements identified." The current sludge management plan and its compliance status with the RCRA are discussed in paragraphs 4.14.1 and 4.14.2 of this section.

4.14.1 Current Sludge Management Plan

The City currently owns an activated sludge wastewater treatment plant on San Francisco Avenue near US Highway 77 in northern part of the City. This plant has a design capacity of 1.0 MGD and has been in operation for several years. In the recent years the performance of this plant has been unreliable and in some instances has violated the permit requirements. Aeration basin in the old plant is operated in extended aeration mode.

Onsite sludge digester is used to achieve 38 percent volatile solids reduction by aerobic digestion of sludge generated from the extended aeration process as per RCRA Section 503. The on-site sludge drying beds are used to de-water and dry the digested sludge. A contract services company disposes off dried sludge cakes at an approved landfill disposal site.
The City obtained grants from a federal program (FHA) to fund construction of a new wastewater

treatment plant. The new plant is under construction at the old plant site. It is designed for 1.5-MGD design capacity using extended aeration process. The construction completion is scheduled for the end of March 1999. The current sludge disposal method will be continued once the new plant is operational.

4.14.2 Recommended Improvements

Section 503 of 40 CFR Chapter I prescribes that for a Class B vector attraction reduction (permit requirement) is accomplished, if the process used for sludge digestion is a Process to Significantly Reduce Pathogens. A digester volume that provides 40-day mean cell residence time (MCRT) at 20-degree Celsius temperature is deemed to meet this requirement.

Once the new plant is operational, the existing aeration basin and digester need to be rehabilitated and used for aerobic sludge digestion. The combined volume of the existing digester and aeration basin is estimated to provide adequate volume for volatile solids reduction per 40 CFR Section 503 plus additional sludge processing demand of the next expansion train.

Additional capital improvements needed are piping modification for sludge diversion, a set of sludge transfer pumps, and new aeration equipment compatible with the existing digester equipment. Exact sequencing of the rehabilitation work should be determined after the new plant is on line.

As discussed in **Section 5.3**, the maximum monthly flows will increase to 3.0 MGD by the year 2024 and 3.5 MGD by the year 2028. The plant site on San Francisco Avenue, where the new plant is currently under construction, has room for addition of an additional treatment module of 1.5 MGD. It is recommended that the planning work for the second module be started immediately. With the construction of the second module, the City will meet its wastewater treatment needs till the year 2024. The aeration basin and aerobic digester of the existing old plant will be rehabilitated to function as aerobic digesters for the new plant under construction. This aerobic digestion capacity may be adequate for processing of the sludge from the combined 3.0-MGD plant. However, additional sludge drying beds may be necessary to process digested sludge from the second plant. For the years beyond 2024, it is recommended that the additional wastewater treatment plants and sludge processing facilities be located at an alternate site.

5.1 EDAP Eligibility Survey

Economically Distressed Areas Program (EDAP) eligibility survey was performed as part of the scope of services with the objective of establishing the qualifications of the subject colonias to meet the eligibility criteria set by the (EDAP). This financial assistance program was established by the 71st Texas Legislature (1989) by a legislation that designated Texas Water Development Board (TWDB) as the administering agency. Under the program, financial assistance is provided to bring water and wastewater services to economically distressed areas where the present water and wastewater facilities are inadequate to meet the minimal needs of the residents. Under the law, projects must be located in economically distressed areas within the affected counties. Affected counties are determined and declared by the TWDB periodically based on the economic indicators and the proximity to the international borders. An area within 64 miles (100 kilometers) of the international border between the US and Mexico whose per capita income is 25 percent below the state average

and unemployment rate is 25 percent above the state average for the last three years is considered to be an affected county. Willacy County is one of 37 affected counties in Texas.

There are three subdivisions outside of Raymondville city limits that were identified to be potentially eligible to receive financial assistance. Located outside of the northern city limit, Los Angeles Subdivision is situated on the extension of Monterey road between the irrigation canal. Ranchette Estates Subdivision is located outside the City limits on the westerly extension of highway 186.

5.1.2 Survey Results

The Business Services Company based in Lyford, Texas provided professional services in conducting a physical survey including contacting residents of the specified colonias to obtain information about the living conditions. A copy of the survey form is included in the appendix of this report. Blank survey form was obtained from Texas Water Development Board.

Table 5-1 presents a summary of survey results for the Ranchette Estates Colonias. There are 25 households registered in the colonia Ranchette Estates and all households have been surveyed. With an average of 4.68 persons per household, the average percapita income is computed to be $ 3,907.56. All houses are on septic tanks. All households except one indicated their interest to connect to a wastewater disposal system, if provided.

Table 5-2 presents a summary of survey results for the Los Angeles Colonia. There are 8 households registered in the colonia Los Angeles and all households have been surveyed. The average percapita income is calculated as $6,452.20. The average number of persons per household is 3.88. Of the eight households surveyed, seven houses have septic tanks and one house uses an open pit. All eight households expressed their willingness to connect to a wastewater system, if provided.

5.1.3 Summary Statement

In summary, Earth Tech is of the opinion that the residents of Los Angeles and Ranchette Estates households live in poor economic conditions and can not support any organized effort to bring wastewater services to their colonias. Extension of financial support under EDAP program to provide wastewater services to the colonia Ranchette Estates and colonia Los Angeles would greately improve environment and quality of life in the Raymondville vicinity; and therefore, conform to one of the prime goals of the EDAP program.

A countywide - study performed in 1991 by Michael Sullivan and Associates for Willacy County documented several facts representing the living conditions in these colonias at that time. Some of the exhibits and documentation are included in the Appendix M.

Table 5.2

Summary of Survey Results: Ranchette Estates Colonia

Item Description	Item Units	Survey Results
Colonia Households	Number	25
Households surveyed	Number	25
Percentage surveyed	Percentage	100
Total residents in colonia	Number	117
Avg. residents per household	Number	4.68
Average Household Income	Dollars per year	$18,287.36
Per Capita Income	Dollars per year	$3,907.56
Water Source	-	North Alamo Water Supply Co.
Existing Sewer Connections	Number of Households	0
Existing Septic Tanks	Number of Households	25
Complete Indoor Plumbing	Number of Households	25
Water problems	Number of "Yes" Responses	6
Water problems	Number of "No" Responses	19
Wastewater problems	Number of "Yes" Responses	8
Wastewater problems	Number of "No" Responses	17
Willing to Connect to sewer	Number of "Yes" Responses	24
Willing to Connect to sewer	Number of "No" Responses	1

Table 5.3

Summary of Survey Results: Los Angeles Colonia

Item Description	Item Units	Survey Results
Colonia Households	Number	8
Households surveyed	Number	8
Percentage surveyed	Percentage	100
Total residents in colonia	Number	31
Avg. residents per household	Number	3.88
Average Household Income	Dollars per year	25,002.25
Per Capita Income	Dollars per year	$6,452.20
Water Source	-	City of Raymondville
Existing Sewer Connections	Number of Households	0
Existing Septic Tanks	Number of Households	7
Existing Open Pits	Number of Households	1
Complete Indoor Plumbing	Number of Households	8
Water problems	Number of "Yes" Responses	0
Water problems	Number of "No" Responses	8
Wastewater problems	Number of "Yes" Responses	3
Wastewater problems	Number of "No" Responses	5
Willing to Connect to sewer	Number of "Yes" Responses	8
Willing to Connect to sewer	Number of "No" Responses	0

City of Raymondville
Water/Wastewater Master Plan
Contract No. 98-483-248

The following maps are not attached to this report. Due to their size, they could not be copied. They are located in the official file and may be copied upon request.

Land Use Map For Years 2003 and 2028
Map No. 1
Job No. 202796
May 1998

Existing Water Distribution System
Map No. 2-B.
Job. 202796
May 1998

Projected Water Distribution System - Yrs. 2003 and 2028
Map No. 2-A
Job No. 202796
May 1998

Existing Wastewater
Collection System
Map No. 3-B
Job No. 202796
May 1998

Projected Wastewater Collection System
Yrs. 2003 and 2028
Job No. 202796
May 1998

Please contact Research and Planning Fund Grants Management Division at (512) 463-7926 for copies.