**CITY OF BRAWLEY**

**BORDER ENVIRONMENT COOPERATION COMMISSION**

**STEP II DOCUMENTATION**

# WASTEWATER TREATMENT PLANT EXPANSION AND IMPROVEMENTS TO THE WASTEWATER COLLECTION AND WATER DISTRIBUTION SYSTEMS

PDF Format

Prepared for

**CITY OF BRAWLEY**

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**Appendix 19 Wastewater Treatment Plant Master Plan**

**Appendix 20 Water Conservation Plan**

**Appendix 21 Documentation for Public Participation Process**

## EXECUTIVE SUMMARY

The City of Brawley is centrally located in the agriculturally rich Imperial Valley of Southern California. Brawley has an estimated population of 21,500 and the city covers an area of about 5.8 square miles. Brawley is located approximately 25 miles north of the International Border and 100 miles east of San Diego.

Brawley's water treatment system was established more than 70 years ago. It is operated as an enterprise fund, wherein the costs of providing potable water to the general public are funded primarily through flat-rate user charges. The City's water supply is obtained from the Colorado River, via the 80-mile-long All American Canal and an extensive downstream canal system operated by the Imperial Irrigation District (IID). There are approximately 4,700 active water accounts. Water service to most customers is presently unmetered (less than 2% are metered).

The City's current water treatment plant will be replaced upon completion of a new treatment plant that is presently in the operation start-up phase. A number of specific technical water treatment processes at the current treatment plant were ruled by the California Department of Health Services to be non-compliant with various state health statutes and regulations.

Brawley's wastewater treatment system was also established more than 70 years ago. Currently, the system is operated as an enterprise fund, wherein the costs of providing wastewater services are primarily funded through flat-rate user fees which are based upon land use. There are approximately 4,600 active wastewater accounts.

Presently, the wastewater treatment plant (WWTP) is treating effluent in excess of 85% of its maximum capacity, in violation of California Regional Water Quality Control Board requirements. The design capacity of the wastewater treatment plant is 3.9 mgd (million gallons per day). A major portion of the sewer and storm drain system is combined, producing storm flows of 8 to 12 mgd that periodically overwhelm the hydraulic processing capacity of the WWTP.

The wastewater treatment plant consists of a primary treatment facility and a secondary lagoon system that provides liquid and solid treatment processes.. The wastewater collection system also includes two lift stations and 67.3 miles of wastewater collection lines and mains.

In April 1997, Brawley submitted a Step I application to the Border Environment Cooperation Commission (BECC) for the Wastewater Treatment Plant Expansion and Improvements to the Wastewater Collection and Water Distribution Systems Project. The application was reviewed and found to conform with the BECC priorities and objectives. The Step I was accepted and authorization was granted to continue the Step II certification process.

BECC certification is sought by the City in order to have accessibility to the Border Environment Infrastructure Fund (BEIF) administered by the North American Development Bank (NADB). In addition, the City is applying for funding from the Economic Development Agency and others. Through assistance from this process, the City of Brawley will be able to plan upgrades of the existing water delivery and wastewater treatment and collection systems, and help to initiate the process of sustainable economic and community development that will reach all segments of the City's population.

### The Project

**Water Supply (Distribution).** The existing distribution system modifications will eliminate negative pressures in the water system. The modifications include the installation of larger diameter pipes and replacement of cast iron pipes with PVC pipes. This will provide a water distribution system without corrosion and negative pressure problems and properly sized for new planned development. The use of properly sized pipes for the existing and future system will improve the water pressure, reduce the potential of failures and require less maintenance. The estimated capital cost for improvements to the existing system is $18.74 million. However, certification is requested only for the Phase I improvements of the existing system in the amount of $5.61 million.

City of Brawley
Estimated Cost of Water Distribution System Improvements
(In Constant Dollars)

| Phases | Construction Years | Million Dollars |
|---|---|---|
| **1** | **1999 - 2004** | **5.61** |
| 2 | 2005 - 2009 | 4.14 |
| 3 | 2010 - 2014 | 4.81 |
| 4 | 2015 - 2019 | 4.18 |
| | | $ 18.74 |

To meet future water demand requirements, the distribution and storage systems should be upgraded to meet the needs of development to the buildout population of 42,101. The projected cost for expansion of the distribution and storage system is $29.1 million, and for the water treatment plant expansion after year 2014 is $17.2 million. Total future system cost is $46.3 million.

The proposed projects for Phase 1 entail the replacement of 39,627 linear feet of 4- and 6-inch diameter cast iron pipe with 8- and 12-inch PVC pipe. Additionally, 3,209 feet of 4- and 6-inch cast iron pipe will be replaced within City limits with 16-inch PVC pipe to provide services to Po colonia; while 10,093 feet of 8-inch asbestos-cement pipe will be replaced with 18-inch PVC pipe to serve La Colonia. Improvements to the water distribution systems for these two *colonias* outside of the City of Brawley's limits will be financed by the U.S. Department of Agriculture as part of their *colonias* program.

**Financial Feasibility of the Water Enterprise Fund**

The financial feasibility of a successful twenty-year period ending in the year 2020 for the Water Enterprise Fund is dependent upon certain assumptions:

- The current water service charge rates (in constant dollars) will be maintained;
- The City's population will maintain at least the "low growth" level to provide adequate service charge revenues;
- Grant funding will be obtained for health related conditions;
- Adequate outside funding will be obtained for future expansion to the water system;
- Final construction estimates will not be exceeded materially.

**Wastewater Treatment.**

This project will provide safe, dependable treatment of wastewater for present and future needs. The present wastewater treatment plant has deficiencies that must be addressed. Due to the combined design of the wastewater and storm drain system, large volume flows during storms result in wastewater receiving only primary treatment prior to discharge

Expanding and upgrading the WWTP will decrease the likelihood of discharging raw sewage into the New River and reduce disease transmission through casual contact with raw sewage, as has happened in the past. The proposed project will increase capacity so that the increased flows that occur during storms can receive both primary and secondary treatment prior to discharge. It will also permit discharge of wastewater effluent that has been treated to a higher degree than currently possible.

The City is required by the California Regional Water Quality Control Board (CRWQCB) to expand the plant capacity since current flows exceed 85% of the design capacity of 3.9 mgd. The plant is in need of additional capacity to accommodate existing demands and near-term development. In addition, failure to take action could result in a penalty of $10,000 per day per violation and other legal concerns/costs associated with the violations. Disinfection facilities need to be added to the treatment process in order to comply with the expected requirements of a future state permit.

The estimated wastewater flow volumes are based, in part, upon information provided in the 1995 Brawley General Plan. See Table below.

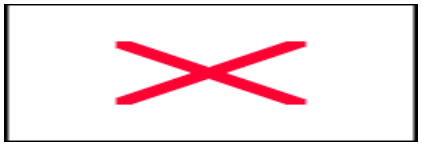
The current permitted effluent requirements are Biochemical Oxygen Demand (BOD) - 45mg/l, Total Suspended Solids (TSS) - 95mg/l, settleable matter - 0.3 mg/l, and average daily flow - 3.9 mgd.

As determined by Roy F. Weston, Inc. (WESTON® ) in the Master Plan for the Wastewater Treatment Plant, the aerated lagoon process was the most favorable alternative. All of the alternative criteria were weighed in an evaluation matrix. The aerated lagoon process scores equal to or higher than the other alternatives in all criteria. The aerated lagoon process is the system currently utilized at the WWTP. Therefore the technology is known by the current operating personnel.

There is a disinfection process requirement expected with the upcoming National Pollution Discharge Elimination System (NPDES) permit. WESTON evaluated three disinfection process alternatives and found Ultraviolet (UV) to be the most favorable, provided the UV system is reevaluated following a minimum 30 day pilot testing period. This pilot testing should be conducted during the design phase of the system. The UV scored most favorable in an evaluation matrix in "safety concerns" and "Installation and O & M costs". The table below displays the estimated capital costs for the wastewater treatment Certification is requested for the Phase 1 Expansion and Phase 1A Disinfection totaling $7,173,000.

**Wastewater Collection System**

The City's wastewater collection system was established more than 70 years ago. Approximately 1,500 acres of the City has a combined storm drain and sanitary system. The results of the analysis in the Master Plan for the Wastewater Collection System indicate that 33% of the collection system lines are undersized when the present system was simulated as the present combined storm drain/sanitary system The recommended capital cost for the collection system were segregated into two categories: (1) replacement and (2) new construction, at $5.5 million and $7.6 million respectively. BECC certification is requested only for the Phase I replacement in the congested areas of the City at an estimated cost of $772,736.



The recommended rehabilitation program includes the replacement of 6,200 linear feet of sewer lines throughout the city.

The recommended method of rehabilitation for line deficiencies that are located in congested areas within the City is removal and replacement of the existing line. Parallel lines are the recommended method of rehabilitation for areas that are predominantly undeveloped.

**Financial Feasibility of the Wastewater Enterprise Fund**

The financial feasibility of the Wastewater Enterprise Fund's success during the impending capital improvement program is dependent upon the following:

- The success of the grant funding program to fund replacement cost, environment related costs and expansion needed to support economic growth.
- The success in obtaining low interest rate financing at long-term paybacks.
- The growth of the City's population over the next 20 years to provide revenues from the wastewater service charges (minimum "low growth" level).
- The success in establishing wastewater service charge rates to obtain the maximum service revenue that is affordable and equitable for the users.
- The success in obtaining expansion dollars from future developers.
- Final construction estimates are not materially exceeded

The NADB developed an evaluation to determine the financial feasibility of the project and to make recommendations regarding the amount of grant the City could receive from such an institution. The following table summarizes the proposed financial scheme.

**Project Financial Structure**

| Available Funding | Amount (US$) | % of Total |
|---|---|---|
| ***Capital*** | | |
| City Contribution | 5,593,902 | 41.25 |
| *Subtotal Capital* | *5,593,902* | *41.25* |
| ***Grants*** | | |
| USDA/RD | 277,000 | 2.04 |
| EDA | 1,500,000 | 11.06 |
| BEIF | 6,190,736 | 45.65 |
| *Subtotal Grants* | *7,967,736* | *58.75* |
| TOTAL | 13,561,683 | 100.00 |

In addition to BEIF construction assistance funds, the NADB analyzed the possibility of providing BEIF transition assistance to allow for a more gradual increase in rates. Nonetheless, no transition funds were recommended as the required rate increase will not be unaffordable to the community, as described below.

A fee rate model was also prepared by the NADB as part of the financial analysis. This model was utilized to determine the impact on user fees of the proposed project under several combinations of grants (both construction and transition) and loans.

The current water rate is $39.25 per month, while the sewer rate is $12.40 per month. The NADB analysis concluded that the current combined water and sewer rate of $51.65 is relatively high given the economical conditions of the City of Brawley. Thus any significant increase in the combined rate will render the project financially unfeasible. The City has increased water rates from $16.00 a month in 1994 to $39.25 in 1999, or a 145% increase in five years. This increase has been the result of debt incurred by the City of $24 million to finance the construction of the water treatment plant. The only increase in rates recommended at this time will be from $12.40 to $13.00 per month for sewer rates, a 4.8% increase.

As required by the BECC, a public participation process was implemented by the project sponsor. The process included the development of a public participation plan, the formation of a steering committee composed of respected members of the community, the distribution of project information by mail-outs, and holding twelve public meetings throughout the City. Additionally, two city-wide public meetings were held on April 15 and August 4, 1999. The results of the financial evaluation were presented during the second public meeting.

The project is consistent with BECC's definition of sustainable development: "…conservation oriented social and economic development that emphasizes the protection and sustainable use of resources, while addressing both current and future needs, and present and future impacts of human actions."

All environmental parameters have been met and the increase in water demand and use is consistent with local planning documents. The expansion of the wastewater treatment plant, coupled with the upgrade of the water distribution and wastewater collection systems, will require little in the way of increased institutional capacity, as the proposed treatment technology is very similar to that already in use at Brawley.

### A. Project Type

The project types are water supply and wastewater collection and treatment. The improvements address current deficiencies to the City of Brawley's (1) water treatment, storage and distribution system and (2) the wastewater collection, treatment and disposal system.

### B. Project Title

City of Brawley Wastewater Treatment Plant Expansion and Improvements to the Wastewater Collection and Water Distribution Systems

### C. Primary Applicant Information

- Name of Organization: City of Brawley
- Name of Contact Person: Jerry Santillan, City Manager
- Address: City Hall, 400 Main Street, Brawley, CA 92227-2941
- Phone Number: 760-344-9111
- Fax: 760-344-0907

### D. Project Location

Project Location: Brawley, California, USA

Site Location: Urban Area

**Description of Project Location**

The potable water and wastewater treatment plants and conveyance systems are located within the incorporated city limits of Brawley, in central Imperial County, California, in the heart of the agriculturally rich Imperial Valley. The city is located 210 miles southeast of Los Angeles, 100 miles east of San Diego, and 25 miles north of Mexicali and the International Border (see Location Map).

**Water System** The water distribution system is comprised of approximately 75 miles of pipeline within the sphere of influence of the City of Brawley.

*Suitability of new site*. The Phase 1 improvements to the water distribution system, replacement of portions of the existing system, will occur in the existing pipe alignment which has been serviceable for up to sixty-five years.

**Wastewater Treatment Plant** The existing Wastewater Treatment Plant is located in the northeast portion of the City, at 5015 Best Canal Road, north of the intersection with Shank Road The planned wastewater treatment plant expansion will be constructed at the site of the current plant (see Site Location Wastewater Treatment Plant).

*Suitability of new site*. The site is large enough to accommodate the recommended expansion, including aerated lagoons, and is adjacent to the New River to easily accommodate the discharging of treated effluent.

**Wastewater Collection System** The wastewater collection system, a gravity flow system, approximately 65 miles long, is within the City's sphere of influence. (See Wastewater Collection System Aerial Photograph, Figure 1-2)

*Suitability of new site*. The Phase 1 improvements to the wastewater collection system, replacement of portions of the existing system, will occur in the existing pipe alignment, which has been serviceable for up to seventy years.

### E. Project Description and Work Tasks

***Project Description.*** The human health and environmental issues to be resolved by the City's planned improvements to both the water distribution system and the wastewater collection, treatment and disposal system are as follows.

**Water Supply.** The existing distribution piping is as much as 65 years old and is comprised of 39% cast iron pipe, 41% asbestos cement pipe (AC) and 20% polyvinyl chloride pipe (PVC). The City has experienced several cast iron pipe failures due to corrosion/tuberculation of the pipe. The corrosion and tuberculation on the interior of the pipes caused significant decrease in the pipe's capacity, creating excessive pressure losses. The loss of water pressure reduces the ability to deliver the water within the City and causes interruption of water service at times of pipe failures. The City has run fire hydrant tests that measure the flow and pressure at each fire hydrant in its system and has recorded negative pressures during high demand times at several locations. One isolated low pressure reading of 28 psi was recorded at a fire hydrant adjacent to a school. The existence of negative pressures in a water system can result in pipe collapse, the introduction of contaminated water into the system from cross-connections, and the inability to meet user demands.. A replacement program for these pipelines is necessary to resolve these problems.

**Wastewater Treatment.** In recent years, two citations have been issued against the City of Brawley by the California Regional Water Quality Control Board, Colorado River Basin Region. The citations resulted from the illegal discharge of raw sewage into the New River. These discharges were caused by the blockage of the entrance of the wastewater treatment plant influent line due to the accumulation of storm debris and by severe corrosion and failure of two manholes. In addition, the plant has recently experienced average daily flows in excess of the 3.9 mgd capacity. The City is required by the California Regional Water Quality Control Board (CRWQCB) to expand the plant capacity since current flows exceed 85% of the design capacity. The plant is in need of additional capacity to accommodate existing demands and projected near-term development. Failure to take action could result in a penalty of $10,000 per day per violation, as well as other legal concerns/costs associated with the violations. Disinfection facilities also need to be added to the treatment process in order to comply with the expected requirements of a future state permit.

**Wastewater Collection System**

The City's wastewater collection system, established more than 70 years ago, is primarily a gravity flow system. Approximately half of the system is a combined sanitary and storm sewer system. The system includes two lift stations, approximately 65 miles (345,000 linear feet) of wastewater collection lines ranging from 6 to 30 inches in diameter, and 1.5 miles of force main. All of the collectors and mains flow to the City's Wastewater Treatment Plant (WWTP), which discharges to the New River. The capacity of the sewers is adequate under normal dry weather flow conditions. However, since the majority of the system is combined sanitary/storm sewer, portions of the system surcharge during heavy rainstorm events

**Program of Project Work Tasks** The following table summarizes the project tasks recommended in the Water Master Plan and the Draft Wastewater Master Plans dated March 1999. The Phase 1 projects in water supply, wastewater treatment and replacement of wastewater collectors, along with estimated costs shown in constant dollars, are included in the certification.


**Description of the Community**

**Demographic Information.** The water and wastewater systems serve an estimated population of 21,000. Continued moderate growth of Brawley's population at approximately 1.7% per year is anticipated for the foreseeable future. Commercial, industrial, and residential development anticipated by the City's 1995 General Plan and 1997 Housing Element predict a 20 year buildout population of between 35,404 and 42,100. The Water and Wastewater Master Plan planned facilities to serve a buildout population of 42,100.

**Local Environmental Services.** Water and wastewater services availability and supply are provided for 100% of the population.

**Project Alternatives.**

**Water Distribution System**

The Water Master Plan evaluated the water distribution system to determine the adequacy of the existing system for serving the needs of the City of Brawley. Two alternatives were evaluated: (1) no project and (2) the replacement of pipelines on a phased basis

**No Project Alternative** The distribution system is as much as 65 years old and is comprised of cast iron pipe (CI) , asbestos cement pipe and polyvinyl chloride pipe. The CI is the oldest pipe and accounts for roughly 39% of the total pipe length. Over the years, the City has experienced several CI pipe failures due to corrosion/tuberculation of the pipe. Corrosion and tuberculation on a pipe's interior can significantly decrease a pipe's capacity, creating excessive pressure losses. Analysis of the existing distribution system indicates adequate pressures for the annual average demand and peak hour conditions, however during maximum daytime with fire conditions, many areas of the City experience negative pressures.

The existence of negative pressures in a water system can result in pipe collapse, the introduction of contaminated water into the system from cross-connections, and the inability to meet user demands. A replacement program for these pipelines is necessary to resolve these problems. The City has experienced several recent failures in the existing CI pipes due to corrosion. In some instances, when the CI pipe was removed, the pipe's interior diameter was less than half of what it was when originally installed. The difference in interior pipe diameter equates to greater pressure loss and lower reliability for peak hour and fire flows. If these conditions continue, there will be an increase in distribution failure and the low water pressure will cause stoppages in delivery of water during the emergency situations. Such conditions are not acceptable in a public water system. The Water Master Plan prepared by Pountney & Associates, Inc. (Pountney) examined existing water distribution systems and recommended replacement of the existing pipelines, recommended future expansion of the new WTP, and future construction of new water distribution system.

**System Modifications Alternative.** To provide adequate pressures during Maximum Day Plus Fire conditions, numerous modifications to the existing system need to be made. The design and construction of the proposed existing system capital improvements are proposed over the next twenty years in four phases. Phase 1 improvements are included in the current project's Step II certification, and include replacement of all the 4" diameter cast iron pipe and a portion of the 6" diameter cast iron pipes, all the highest replacement priority The following changes are included in Phase 1:

Po Colonia pipe replacement $ 447,327

La Colonia pipe replacement $ 1,520,647

4" and 6" CI replacement $ 3,615,928

Total Phase 1 Improvement $ 5,615,902

**Wastewater Treatment**

In the Wastewater Treatment Plant Master Plan dated March 1999 (WWTPMP), WESTON evaluated four treatment process alternatives. The four treatment processes evaluated were: (1) No action, (2) Aerated lagoon, (3) Combination aerated lagoon and activated sludge, and (4) Aerated lagoon with reclaimed water.

The selection of these alternatives for review was based on the overall treatment objectives and suitability for the City's needs. All process systems evaluated assumed that screening and grit removal would occur at the headworks of the WWTP prior to the influent entering the first major process equipment.

**Wastewater Treatment No Action Alternative** The "No Action" alternative was evaluated to identify the necessity of the WWTP improvements and the potential concerns which would be encountered if no action were taken. The WWTP is currently in need of additional capacity to accommodate existing flows. The average daily flow capacity of the plant is 3.9 MGD; the plant is experiencing flows near, or in excess, of this capacity. Flows experienced in September 1998 ranged from 3.91 MGD to 4.27 MGD. This excessive flow resulted in a Notice of Non-Compliance being issued by the California Regional Water Quality Control Board (CRWQCB) on 4 November 1998. The Notice is issued when violations of the City's NPDES permit occur, in this case, the flow constituent. The City is required to take corrective action addressing this concern. Failure to take action can result in a penalty of $10,000 per day per violation and other legal concerns/costs associated with the violations. Since the City is anticipating additional near-term development, the WWTP would also need additional capacity to accommodate the growth. If no action is taken, future development must be postponed until a plan for additional capacity is implemented. This would result in a loss of potential revenue from the developed property and potential fines from the USEPA and CRWQCB.

**Wastewater Treatment Aerated Lagoon Process Alternative**

The aerated lagoon treatment process is the system currently utilized at the WWTP. This system basically consists of the following steps:

- Screening and grit removal (headworks),
- Primary clarifiers,
- Aerated lagoons,
- Stabilization ponds,
- Discharge to New River.

The design of this process is based on a three phase implementation plan consisting of increased capacity increments of 2 MGD, 3 MGD, and 3 MGD to obtain an ultimate treatment capacity of 12 MGD. The Phase 1 to be certified is shown in Figure 2-1

**Wastewater Treatment Combination Aerated Lagoon and Activated Sludge Alternative**

The combination aerated lagoon and activated sludge treatment process would actually be considered two different and separate systems, and operated as such.

The activated sludge process basically consists of the following steps:

- Screening and grit removal (headworks),
- Aeration structure,
- Secondary clarifier, and
- Discharge to New River

See the WWTPMP for the design of this process (Appendix 17, Table 4-3) and a layout of the required facilities for Phase 1(Figure 4-1). These are based on a three phase implementation plan consisting of 2 MGD, 3 MGD, and 3 MGD capacity increases to obtain an ultimate 12 MGD capacity.

**Wastewater Treatment Aerated Lagoon Process with Reclaimed Water Alternative**

The aerated lagoon with reclaimed water process is identical to the aerated lagoon process described above, with the exception of the discharge location. In this process, the effluent would be discharged across the surrounding acreage rather than into New River. This effluent would also serve as irrigation for the agricultural acreage.

The public agencies involved in regulating effluent discharge are the CRWQCB and the Department of Health Services (DHS); the primary agency regulating water reclamation is DHS. The DHS and CRWQCB refer to this overland discharge of effluent as "Reclaimed Water." DHS has established regulations and guidelines for reclaimed water. Effluent parameters established by DHS for reclaimed water, based on agricultural classification, are more stringent than for effluent discharged into New River The more stringent effluent parameters required for reclaimed water will require that the process of the existing WWTP facility be converted to activated sludge. This activated sludge process must also be maintained throughout all future expansions. The capital costs and O&M costs for this alternative would therefore be significantly higher than the aerated lagoon process or combination aerated lagoon/activated sludge process. Consequently the reclaimed water alternative was eliminated from further consideration.

**Comparison of the Wastewater Treatment Process Alternatives**

The WWTPMP evaluated the treatment process alternative in an evaluation matrix in Table 4-2 of the WWTPMP (see Appendix 17). The Aerated Lagoon alternative was rated superior in technical issues, area requirements, safety to the operators, and cost related issues. Capital cost and O & M cost were calculated to be less than the other alternatives. Environmental impact potential was the most favorable for the Aerated Lagoon and Combination Aerated Lagoon and Activated Sludge Alternatives. The Aerated Lagoon Alternative is clearly the most favorable alternative. Certification is hereby sought for the first phase increment increase of capacity of 2 mgd.

**Wastewater Treatment Disinfection Alternatives**

The WWTPMP evaluated three disinfection process alternatives:

- Chlorination/Dechlorination (gas system)
- Sodium Hypochlorite (Bleach)/Sodium Bisulfite
- Ultraviolet (UV)

The UV was scored as the best alternative in an evaluation matrix. UV scored highest in safety issues, installation/structural cost, and O & M cost. UV scored lowest in reliability at TSS level of 95 mg/L. The actual TSS level discharged from the WWTP has an average monthly value of 37 mg/L, based on 2 years of data. A UV system is more reliable at this TSS level. WESTON recommended that the scoring for the UV system should be reevaluated following a minimum 30 day pilot testing period. The disinfection process considered most favorable after the 30 day UV testing will be part of the certification.

**Wastewater Collection System** The primary objective of the Wastewater Collection System Master Plan dated January 1999 (WCSMP, Appendix 16) was to evaluate the capacity of the existing sewers under present and future flow conditions. The wastewater collection system, in its current form and condition, is adequate under normal dry weather flow conditions. However, since the majority of the system is combined sanitary/storm sewer, portions of the system surcharge during heavy rainstorm events.

**Wastewater Collection System No Project Alternative**

The WCPMP observed that since a majority of Brawley's collection system is composed of combined sewers, the system is heavily impacted by direct runoff during wet-weather events. During wet weather, the combined portion of the collection system serves as drainage conduits for approximately 1,500 acres of the City. The WCPMP analysis showed that approximately 33% of the collection system lines are undersized when the system was simulated as a combined system. As a separated system, approximately 4% and 27%, of the lines modeled in year 1998 are undersized, in dry weather conditions and wet-weather conditions, respectively. Consequently, improvements to the collection system are warranted.

**Wastewater Collection System "Priority Ranking" Alternative**

The WCSMP provided a priority ranking of the replacement of the existing system based on the following assumptions:

- Dry weather deficiencies are more critical than wet weather deficiencies.
- Existing deficiencies are more important than future deficiencies.
- Projects are prioritized by the severity of the deficiency, as measured by the ratio of flow to existing capacity (percent full) for each scenario evaluated.
- A critical deficiency occurs when the flow exceeds 120% of capacity.
- System should be a separate sewer and storm system.

Based on these assumptions, three priority categories for mains were defined:

- Existing dry weather (separated system)
- Percent full, 2020 dry weather (separated system)
- Percent full, 2020 wet weather (separated system)

Each sewer rehabilitation considered was sized for 2020 wet weather flow. 2020 wet weather flow is defined as a 2 year, 5 hour storm event. The system is assumed to be separate sanitary sewer and storm sewer systems. Projects are prioritized by category and ranked by percent full. A critical deficiency occurs when the flow exceeds 120% of capacity. Projects were further ranked according to construction phases. Four construction phases are assumed as follows:

Construction phases are based on the anticipated date of construction for build-outs, or on the available capacity to convey year 2020 wet weather design flow. Rehabilitation projects impacted by new construction are included in the appropriate construction phase.

The recommended method of rehabilitation for line deficiencies that are located in congested areas within the City is removal and replacement of the existing line. Construction of parallel lines is the recommended method of rehabilitation for areas that are predominantly undeveloped.

The total cost of construction projected to the year 2020 is estimated to be $13,115,800. This amounts to an average expenditure of approximately $655,790 per year, until the year 2020. Certification is being sought only for the first phase of the rehabilitation in the amount of $772,736.

**Project Justification.**

**Water System Improvements** As noted above, the existing system during "high demand periods" experiences negative pressures in the water system which can result in pipe collapse, the introduction of contaminated water into the system from cross-connections, and the inability to meet user demand. Such conditions are not acceptable in a public water system.

**Wastewater Treatment Plant Expansion** The City is required by the California Regional Water Quality Control Board (CRWQCB) to expand the plant capacity, since current flows exceed 85% of the design capacity. The plant is in need of additional capacity to accommodate existing demands and near-term development. In addition, failure to take action could result in a penalty of $10,000 per day, per violation and other legal concerns/costs associated with the violations. Disinfection facilities need to be added to the treatment process in order to comply with expected requirements of a future state permit. In addition, discharges of untreated sewage into the New River have occurred. These events were caused by the blockage of the entrance of the wastewater treatment plant influent line due to the accumulation of storm debris and by severe corrosion and failure of two manholes. Expansion of the WWTP will remedy these potential future health and environmental threats.

**Wastewater Collection System Replacement and Expansion** Approximately 33% of the collection system lines are undersized when the system was simulated as a combined system. As a separated system, in dry weather conditions and wet weather conditions approximately 4% and 27%, respectively, of the modeled lines in year 1998 are undersized. Portions of the system surcharge during heavy rain events. Consequently, improvements to the collection system are warranted to prevent possible sewer overflows.

Improvement to all of the water and wastewater facilities infrastructure is necessary to foster economic growth and employment opportunities, as well as, to improved the quality of life in the City of Brawley.

### D. Conformance with International Treaties and Agreements.

It is not anticipated that these projects will affect any international treaties or agreements with Mexico. All discharges will be maintained exclusively within U. S. territory and hence will not impact Mexico.

### *A.* Human Health & Environmental Need

The sole purpose for the City of Brawley's Water Distribution System, the Wastewater Treatment Plant and the Wastewater Collection System existing system improvements is to address human health and safety, and environmental needs.

**Water Distribution System** In Phase 1 this project will replace portions of the existing distribution system with polyvinyl chloride (PVC) pipe to provide corrosion free, higher pressure water distribution. The existing distribution system includes cast iron pipes that are as much as 65 years old. The local alkaline soils attack these pipes from the exterior and the alkaline water attacks them from within. The pipes have become corroded and/or have extensive encrustation on the interior due to the salt buildup. This causes negative pressures in the water system which can result in pipe collapse, the introduction of contaminated water into the system from cross-connections, and the inability to meet demands. The results are:

1. Inadequate water pressure to meet the peak demand. This is dangerous situation in times of high summer temperatures or a fire emergency.
2. Intrusion of contaminated water can be a public health issue with grave consequences and demands immediate capital improvement.
3. Corrosion of pipelines can cause surface cave-ins, a public safety concern.

**Wastewater Treatment Plant**

This project will also provide safe, dependable treatment of wastewater and provide for future growth of the city. The present wastewater treatment plant has deficiencies that must be addressed. Due to the combined design of the wastewater and storm drain system, large volume flows during storms necessitates that wastewater receives only primary treatment prior to discharge. In recent years, two citations have been issued against the City of Brawley by the California Regional Water Quality Control Board (RWQCB), Colorado River Basin Region. Both citations resulted from the illegal discharge of raw sewage from the wastewater treatment system into the New River. The first citation, Administration Civil Liability Order No. 94-063, was issued on May 20, 1994 following the discharge of an estimated 1.93 million gallons of raw sewage into the New River. The second citation, Time Schedule Order No. 97-115, was issued on July 28, 1997 following the discharge of an estimated 36,000 gallons of raw sewage into the New River on June 25, 1997.

In addition, the RWQCB issued a Notice of Noncompliance on November 4, 1998 citing the City for discharging treated effluent to the New River in excess of the daily maximum allowed by the wastewater treatment plant permit. The New River flows northerly to the already polluted Salton Sea.

The existing and future discharge permits are as follows:

The Phase 1 certified project, expanding and upgrading the WWTP, will decrease the likelihood of discharging raw sewage into the New River and reduce disease transmission through casual contact with raw sewage. It will increase capacity so that the increased flows that occur during storms can receive both primary and secondary treatment prior to discharge. It will also permit discharge of wastewater effluent that has been treated to a higher degree than currently possible. The addition of disinfection to the process will further treat the effluent before discharge.

**Wastewater Collection System**

The wastewater collection system was established more than 70 years ago. Over 50% of the system is combined sanitary/storm sewer and during heavy rain storm events, portions of the system surcharge. The pipeline segments selected for replacement under Phase 1 are those that determined as undersized during dry weather conditions when tested in a sewer collection system model. These pipelines were identified as priority replacements by larger diameter pipelines to prevent future surcharging and eventual health threats to the community.

Without the water delivery system and wastewater treatment system projects, public health problems may plague the community, perpetuating the spread of disease, continued school absenteeism, increased medical expenses, and the lost productivity.

## B. Environmental Assessment

The proposed projects require an environmental assessment. The documents for the public projects were prepared as required under state and federal law by Mooney & Associates. Appendix 11 of the City of Brawley Water and Wastewater Master Plan, prepared by Mooney & Associates, dated May 20, 1999 contains the Environmental Assessment/Mitigated Negative Declaration, as well as copies of the biological and archaeological surveys reports, and a copy of the EPA Finding of No Significant Impact (FONSI).

EPA issued a FONSI for the proposed project on July 28, 1999. The document underwent a 30-day public comment period through August 26,1999 (see Appendix 11).

The Mitigation Measures identified by Mooney & Associates in the April 20, 1999 draft are as follows:

**Cultural Resources**

**1. Existing Conditions**

Archaeological evidence suggests that humans have intermittently occupied the Imperial Valley for at least 12,000 years. Camps were often established near surface water streams. Significant archaeological resources potentially occur along the undeveloped banks of the New River and on the terraces overlooking the river channel. There is little or no potential for archaeological resources on the valley floor due to the disruption of surface from intensive agriculture.

A record search was conducted for the City of Brawley in 1979 to determine if any cultural resources sites have been identified. The records search did not reveal any indication of archaeological resources in the City limits. A cultural resource sensitivity map was prepared by Imperial Valley College for the County of Imperial General Plan update. The New River corridor is one of the few areas shown as potentially having highly sensitive archaeological resources. The New River was used extensively by the Kamia, a historic Yuman group, as late as the mid-1800s. There is little or no potential for archaeological resources on the valley floor due to the disruption of surface from intensive agriculture.

A cultural resource survey of the proposed wastewater treatment facility site was conducted by Mooney & Associates archaeologists. The study area consists of the area within the existing WWTP boundary proposed for siting of two new primary clarifier tanks, per the Aerated Lagoon expansion recommendation. No archaeological resources were identified in the existing WWTP boundary. A records search with the Office of Historic Preservation (OHP), Southeast Information Center, Imperial Valley College Museum and literature review were conducted for the study area of the Wastewater Treatment Plant. Record search information revealed that, within the WWTP area, no previous archaeological surveys have been conducted, and that there are no known, recorded archaeological or historical resources within the study area boundary.

**2. Impacts of Proposed Phase 1 Project Improvements**

All of the Phase 1 pipeline improvements fall within existing street systems, and therefore, in areas that have previously been graded and paved. Potential impacts to cultural resources associated with the pipeline projects within existing roadways are not significant based on the disturbed nature of roadbeds and the small size of the pipelines to be installed.

Within the WWTP boundary, the majority of the acreage is developed. Most land forms have been graded, excavated and intensively modified. No cultural resources were determined to be on or in the vicinity of the project site. The complete Cultural Resources report is in Appendix B of the Environmental Assessment.

**Biological Resources**

In order to determine if the proposed action would have the potential to impact biological resources, a biological inventory of the WWTP site, surrounding lands, and access road was conducted. This report is included in this EA/MND as Appendix C. The purpose of this survey was: 1) to compile a list of plant and wildlife species that occur along the access road and within a one-acre area surrounding the proposed site; 2) to provide a report that could be used by the lead agencies to expedite project review; and 3) to provide recommendations to facilitate project actions in a manner that reduces the potential for directly or indirectly affecting wildlife and plants.

**1. Habitat**

The most significant biological resources in the Brawley Planning Area are associated with the desert riparian and freshwater marsh habitats along the New River. The New River is not a wild or scenic river. A substantial portion of the Planning Area is devoted to crop production. Although not considered sensitive, agricultural and other disturbed areas can provide valuable habitat to certain animal species such as large mammals, birds and raptors because they provide foraging opportunities.

**2. WWTP Site**

**Sensitive Animal Species**

A variety of sensitive animal species occur in Imperial County. The majority of these sensitive species are birds that forage in agricultural fields. Three sensitive wildlife species were either observed or considered to be potentially present.

A group of white-faced ibis was noticed flying over the WWTP property several times. This species is a State Species of Concern and is a winter migrant to Imperial Valley. A northern Harrier, which is also a State Species of Concern, was also observed flying over the northern end of the property, however, no nests were observed on site. This species feeds on small mammals, so it would not be expected to utilize the WWTP property, except possibly as a nesting site. The Northern harrier typically nests in open grassy fields, and there are currently no undisturbed fields to accommodate their habitat.

The burrowing owl is a State Species of Concern which often uses the burrows of squirrels or other small mammals. No evidence of burrowing owls was noted, although the species is known to occur within the general vicinity of Brawley. No small mammal burrows were noted during the survey, indicating an absence of rodents from the site. Without the presence of their primary food source, the potential for the burrowing owl to utilize the WWTP site is very low.

**Sensitive Plant Species**

Most of the WWTP is devoid of vegetation. Landscape material has been planted along the perimeter of the existing buildings. Offsite and to the north, the property had been recently disced as part of an agricultural operation. The offsite property to the west is primarily devoid of vegetation, except where it is adjacent to the New River. Although periodically cleared, this area is left fallow. The routine clearing of vegetation as part of the WWTP site maintenance and as part of the agricultural activities offsite has suppressed natural recruitment of native vegetation.

**3. Impacts of Proposed Water and Wastewater Master Plans**

Implementation of the Brawley Water and Wastewater Master Plans will result in the construction of new pipeline and removal and replacement of existing pipeline. This development will primarily occur on land where existing roadway exists or on land previously disturbed by agricultural uses. The majority of the projects recommended by the Master Plan are pipeline replacement projects within paved roadways.

Most of these roadways are residential streets and are lined by trees and landscaping. Adoption of the Water and Wastewater Master Plans would result in no direct impacts to biological resources.

**4. Impacts of Proposed Phase 1 Project Improvements**

No impacts to biological resources will result from the pipeline replacement projects within the existing roadways. No impacts are expected to trees lining the roadways. All construction will be confined to public rights-of-way.

No threatened or endangered or sensitive plants, were observed on the WWTP expansion site and none are expected to occur within the project area. No wetlands or sensitive or critical habitats were found on site. A buffer zone of 50 feet from the New River would be included in the WWTP plans, therefore, there would be no impact to wetlands. Since there were no threatened, endangered or sensitive plants within the study area, there will be no impacts. Expansion of the WWTP would not impact the white-faced ibis or burrowing owl due to their low potential for utilizing the site. There is a potential to impact the northern harrier if it is nesting onsite during construction

**Geology/Soils**

**1. Existing Conditions**

Imperial County can be generally divided into three geomorphic provinces: the Peninsular Range, the Salton Trough, and the Mojave Desert. The Salton Trough underlays the majority of the County including the Brawley Planning Area, and is often referred to as the Salton Sink, Salton Basin, Cahuilla Basin and the Imperial Valley. The Brawley Planning Area is underlain by a relatively thin sequence of Quaternary-aged (1.6 million years before present) lake-bed deposits. The lake bed deposits rest on a thick sequence of Tertiary age (1.6 to 63 million years before present) and older marine and non-marine sediments and volcanic rocks. Alluvial deposits are found in the New River Channel. The topography of the Planning Area is nearly flat with the exception of the bluffs along the New River Channel.

**2. Seismic Conditions**

The Salton Trough is bounded by the San Andreas Fault System on the east and the San Jacinto and Elsinore-Laguna Salada Fault Zones on the west. These fault zones mark the boundary between the North American and Pacific Plates. Ground shaking during an earthquake is the most significant seismic hazard in Brawley. The Imperial, Superstition Hills, and Superstition Faults are most likely to cause significant ground shaking in Brawley.

**3. Soils**

Alluvial soils occur in the New River channel. These lake-bed deposits consist primarily of porous and unconsolidated clay, silt, and sand with traces of gravel and salt deposits. Liquefaction may occur when loose, unconsolidated, saturated, sandy soils are subjected to ground vibrations during a seismic event. The sediments exposed in the relatively steep bluffs of the New River are susceptible to landsliding and other slope instability problems.

**4. Impacts of Proposed Water and Wastewater Master Plans**

The proposed water treatment facilities, water distribution pipeline, wastewater treatment plant and wastewater collection system are within areas where the soils have been disturbed by previous grading. All improvements will take place on already developed grounds of the existing treatment facilities. Common geologic concerns in Imperial County include earthquakes. Soil specific concerns include rates of compaction/settlement, shrink/swell, and erosional characteristics.

Available geologic information about the proposed pipeline routes indicates that there are no geologic conditions present that would preclude development along any of the proposed pipeline alternate routes. Areas of geologic instability could generally be mitigated with standard engineering practices or avoided by selecting alternative pipeline alignments. The soil and rock along the proposed pipeline routes would generally be suitable for excavation and fill. The proposed action itself would not be constrained by geologic features and would not result in significant geology or soils impacts. The proposed improvements in the Water and Wastewater Master Plans would not require extensive grading or landform alteration. The disruption and covering of existing soils would not be significant.

**5. Mitigation Measures**

Prior to implementation, each project shall be assessed by the City of Brawley for its structural stability during a geologic event and for the appropriate engineering design, given the soils and hydrologic conditions where located. The results of the investigations will be used in the final project design. No further mitigation measures are required.

**6. Impacts of Proposed Phase 1 Project Improvements**

All improvements will take place on already developed grounds of the existing treatment facilities. Common geologic concerns in Imperial County include earthquakes. Soil specific concerns include rates of compaction/settlement, shrink/swell, and erosional characteristics. There are no impacts to geology/soils from the Phase 1 Project improvements

**Air Quality/Odor**

**1. Existing Conditions**

Air quality has been monitored in Imperial County since 1976. Particulate matter ($PM_{10}$) is monitored in Brawley and both $PM_{10}$ levels and ozone are monitored in El Centro. Ozone and PM levels exceed state standards in Brawley and the City is a non-attainment district for both. The Imperial County Air Pollution Control District (APCD) has prepared a plan to reduce ozone-forming emissions and attain state ozone standards. The APCD Air Quality Attainment Plan was prepared in 1991. The following strategies are included in the APCD Air Quality Attainment Plan: use of mixed land use to reduce reliance on the automobile; balancing jobs and housing by providing employment near residential areas; and communication, coordination and monitoring to review and implement land use management programs.

The urbanized portion of the Brawley Planning Area is surrounded by land used for agricultural production. Urban uses adjacent to or downwind of agricultural areas are occasionally subject to unpleasant odors and airborne pesticides

**2. Impacts of Proposed Water and Wastewater Master Plans**

Adoption of the Water and Wastewater Master Plans would not directly impact air quality in Brawley. There are no sources of potential long term air impacts associated with the, implementation of recommendations, will however planned construction activities, could potentially result in short-term, construction-related impacts. The principal sources of potential air quality impacts associated with the proposed project are primarily associated with the construction effort, and include the following:

- Exhaust emissions from construction equipment;
- Fugitive dust from earthmoving operations;
- Fugitive dust from vehicles on paved and unpaved roads;
- Exhaust emissions from vehicles delayed by project related traffic control; and,
- Gaseous and particulate emissions from vehicles used by construction workers for commuting.

The California Air Resources Board (ARB) estimates that each acre under construction generates about eight pounds of fugitive dust per day. While no long-term air quality impacts would result from future pipeline operations, the operation of wastewater treatment facilities could result in treatment process emissions and odors. Long-term air quality impacts and corresponding mitigation measures will be assessed by the City of Brawley prior to implementation of Plan recommendations

**3. Impacts of Proposed Phase 1 Project Improvements**

The principal sources of potential air quality impacts associated with the proposed project are primarily associated with the construction effort, and include the following:

- Exhaust emissions from construction equipment;
- Fugitive dust from earthmoving operations;
- Fugitive dust from vehicles on paved and unpaved roads;
- Exhaust emissions from vehicles delayed by project related traffic control; and,
- Gaseous and particulate emissions from vehicles used by construction workers for commuting.

Odor from treatment facilities is always a primary public concern. As is true of all wastewater treatment facilities, the operations at the City-operated plant involve occasional emissions of objectional odors during either the treatment process or equipment failure. The improved treatment facilities should reduce current levels of odors, which are not considered to be significant. There are no sensitive receptors in the project areas and no significant air quality or odor impacts are expected

**4. Mitigation Measures**

Dust control measures are required by Air Pollution Control District rules. Measures such as frequent watering, paving of access roadways, and periodic street washing in construction areas can reduce the dust generation rate by approximately 50 percent.

Although the production and emission of odors resulting from wastewater treatment processes cannot be prevented entirely, the impact of odors from the proposed improvements would be minimized in the same manner as odors are currently limited at the treatment facility. Specifically, the City shall continue to limit odors by:

- Providing the capability to adequately aerate and oxygenate treated wastewater.
- Providing reliable equipment and incorporating redundant features, such as back-up pumps and stand-by generators, into project design to ensure emergency back-up capacity in the event of mechanical or system failure.
- Continuing present odor control programs which involve ventilation of structures, covered structures, the use of masking agents, the use of non-odor-causing chemical treatments, aeration and aerobic digestion of wastewater, and continued surveillance and maintenance of equipment to minimize mechanical failure or breakdown.
- Sensitive receptors will be identified prior to construction of improvement projects and air quality mitigation measures implemented where significant impacts will occur.

Emission and odor control facilities will be incorporated into the engineering design of treatment plant expansions.

## Hydrology/Water Quality

### 1. Existing Conditions

**Surface Water** The New River is the only natural surface water feature in Brawley. The New River presently flows into the Imperial Valley from Mexico with a significantly high waste load. The New River is subjected to pollution from raw and partially treated sewage and industrial waste from Mexicali, Mexico. As the river circulates through Imperial County, the flow dramatically increases as the result of drainage from the agricultural lands.

**Groundwater** Brawley is located in the Imperial hydrographic subunit. Groundwater quality in the region is generally poor, although isolated aquifers of good quality groundwater do occur. The poor groundwater quality is attributable to infiltration of agricultural runoff, and the presence of subsurface salt episodes of flooding, evaporation and subsequent deposition. Groundwater of the Imperial hydrographic subunit is generally unsuitable for domestic consumption under federal and state drinking water standards

### 2. Impacts of Proposed Action

The proposed action itself would not impact water resources. Implementation of the Master Plans however, could result in indirect impacts to water quality. The project would have a beneficial impact by improving effluent levels produced by an improved wastewater treatment facility. Additionally, local water supply will be benefited by increased water levels from improvements to pipeline. Pipe replacement will eliminate the extensive encrustation on the pipe interior, which will increase pressure levels and give greater reliability for peak hour and fire flows

### 3. Impacts of Proposed Phase 1 Project Improvements

Replacement of water and wastewater pipeline and the expansion of the Wastewater Treatment Plant would have a beneficial impact to water quality in Brawley. Replaced pipeline will provide more efficient and reliable water distribution throughout the city. An improved wastewater treatment facility will reduce effluent levels and therefore no significant negative impact is associated with the proposed action.

### 4. Mitigation Measures

No mitigation measures are required for pipeline replacement projects within existing roadways. Standard construction site erosion control measures should be required for the pipeline and wastewater treatment plant expansion projects.

## Health and Safety

### 1. Existing Conditions

Several environmental conditions pose potential threats to public health and safety in Brawley. These conditions include seismic and other geologic hazards, flooding hazards, hazardous materials, fire and airport operations.

**Flooding** The New River occasionally floods during intense precipitation events. Flooding is presently not considered hazardous in the Planning Area because little development occurs in the flood channel and the elevation of the channel is substantially lower than the valley floor.

**Hazardous Materials** Accidents can occur during the use, storage, transport and disposal of hazardous materials and result in environmental contamination and threaten public health. Hazardous materials are used at industrial and commercial operations, farms and businesses related to agricultural production, the airport, and Union Pacific Railroad, including chemicals used at Wastewater Treatment Facilities.

### 2. Impacts of Proposed Action

The City shall continue to use the standard safety practices with the proposed action, and no significant impacts to health and safety will occur. There will be no development in a floodplain, thus there will be no impacts due to flooding.

### 3. Impacts from the Proposed Phase 1 Project Improvements

As with all treatment facilities, the existing wastewater treatment facility is enclosed by fencing and is clearly marked as a restricted area. Signs are posted on the fencing that prohibit unauthorized entry and warn that wastewater should not be consumed. Standard treatment practices are maintained to insure that all facilities are in compliance with County, State and Federal treatment and discharge regulations

### 4. Mitigation Measures

For pipeline projects, all necessary barricades, traffic cones, warning signs, lights and other safety devices shall be provided.

## Noise

### 1. Existing Conditions

Noise is generally defined as annoying, harmful, or unwanted sound. Community noise levels are measured in terms of intensity and duration. Intensity is average over a 24-hour period and is expressed in decibels (dB) on a logarithmic scale. Ambient noise levels in populated areas are typically measured using a weighted average of the sound energy level during specified measurement period.

Existing noise in Brawley is primarily the result of transportation activities. Three State Routes converge in Brawley and the associated car and truck traffic generates substantial noise during both the day and night. The airport and railroad also produces noise. Other sources in addition to transportation activities include commercial, industrial and agricultural operations. The existing water treatment facility and wastewater treatment plant are not located near any sensitive noise receptors.

**2. Impacts of Proposed Action**

Adoption of the Water and Wastewater Master Plans would not directly increase noise levels in Brawley. Implementation of these Plans would typically require construction activity, which would increase daytime noise levels in adjacent areas. The duration of the construction-related noise would depend on the nature of the project. For example, pipeline construction projects can result in intense, intermittent noise during the construction period.

Noise generated by construction activities for the proposed program would be a short-term adverse impact, but would generally not be significant. The noise levels would be typical of construction and improvement projects that often occur in urban areas. The increase in noise would be experienced for a limited time period, and phased over a 20-year period, therefore, the potential impact will not be significant.

**3. Impacts of Proposed Phase 1 Project Improvements**

Construction noise would most severely affect noise-sensitive residential, recreational and educational land uses that are near the construction sites, however, the project is not located near any sensitive noise receptors.

**4. Mitigation Measures**

The following measures are suggested to reduce short-term, adverse noise impacts that would result from the Wastewater Treatment Plant Expansion project:

- Select the most quiet type of equipment possible, and install factory-standard silencing equipment on power-operated equipment.
- Turn off idling equipment;
- Schedule the noisiest operations to coincide with the time of highest ambient noise levels.

Any significant noise impacts would be avoided or mitigated by compliance with the City Noise Ordinance.

**Land Use**

**1. Existing Conditions**

The City of Brawley is located in a broad desert that has been transformed into productive agricultural lands by imported irrigation water. The City of Brawley presently contains a variety of residential uses. Non-residential uses include commercial, office, industrial, school, civic and other public uses. Approximately 5.2 percent of the Planning Area is occupied by non-residential uses. Land uses along the pipeline routes include commercial, residential, etc.

State planning law requires consistency between a city's general plan and zoning ordinances. The land use designations have been revised in the updated Brawley General Plan. The Zoning Ordinance serves as the primary implementation tool for the Land Use Element policies and programs.

**2. Impacts of Proposed Action**

Adoption of the Water and Wastewater Master Plans would not directly impact land use in Brawley. According to the General Plan, as Brawley matures, additional demands will be placed on public facilities such as Water and Wastewater. Implementation of recommendations would be in accordance with the General Plan Land Use Element to alleviate infrastructure systems not currently capable of accommodating project growth areas, as well as replacement of aging portions of the system in order to maintain quality services. Recommendations in the Water and Wastewater Master Plans shall be implemented in current Public Facility Designated areas.

Short-term land use impacts caused by construction of the proposed pipelines would result from street closures, truck traffic, and disruption to local traffic using the street system to reach residences and businesses. Residential and commercial areas would also be disrupted by the noise from construction equipment.

**3. Impacts of Proposed Phase 1 Project Improvements**

All pipeline replacement projects within Phase 1 will occur in existing streets, and will not conflict with any land uses. The proposed WWTP expansion project will not substantially change the overall land use character of the area, since the project site is currently being used as the existing wastewater treatment plant. There are no residential, commercial or industrial land uses in the area.

**4. Mitigation Measures**

There are no significant impacts, and therefore no mitigation measures are required.

### Agricultural Lands

**1. Existing Conditions**

Imperial County, including the Brawley Planning Area is one of the finest agricultural areas in the world. This accomplishment is due to several environmental and cultural factors including good soils, a year-round growing season, the availability of imported water from the Colorado River, and a climate suited for raising livestock. Due to a growing public concern over farmland losses in California, the state Department of Conservation implemented a Farmland Mapping and Monitoring Program (FMMP) in 1982. The primary purpose is to monitor conversion of the state's agricultural lands. Substantial acreage of Prime Farmland and Farmland of Statewide Importance is located in the Brawley Planning Area. Both Prime Farmland and Farmland of Statewide Importance are considered Important Farmland.

**2. Impacts of Proposed Action**

The implementation of the proposed Water and Wastewater Master Plans occurs within existing developed areas, and will not impact either Prime Farmland or Farmland of Statewide Importance. Construction of the proposed pipelines would have minimal direct impacts to agricultural areas. Short-term crop damage from construction generated dust in immediately adjacent areas is not expected to be significant.

**3. Impacts of Proposed Phase 1 Project Improvements**

The Proposed Action takes place within the existing Wastewater Treatment Plant area and streets and therefore, there are no impacts to agriculture associated with the project.

**4. Mitigation Measures**

There are no impacts associated with the Proposed Action, and therefore no mitigation measures are required.

## Transportation/Traffic

**1. Existing Conditions**

The existing roadway system in the Brawley Planning Area is served by State Routes 86, 78 and 111. Major north-south roadways in the Brawley Planning Area include Best Road, Eastern Avenue, Eighth Street, Imperial Avenue, First Street, and Western Avenue. Major east-west roadways include Mead Road, Malan Street, Main Street and River Road. Brawley experiences substantial truck traffic within the urbanized area due to the fact that the agricultural sector of Imperial Valley generates a large number of local and regional truck trips.

**2. Impact of Proposed Action**

Where the proposed pipelines would be placed in open trenches within existing roadway right-of-ways, there would be short-term traffic impacts associated with construction. These impacts would include disruption to through traffic as a result of street and lane closures; truck traffic from construction; and movement of equipment operators, carpenters, laborers and other construction and supervisory personnel who will typically arrive at 7:00 a.m. and depart at 4:00 p.m. These impacts would be limited to those portions of the project where the pipeline is placed in paved roadways. Pipeline construction will occur in several existing roads throughout the City, and road closures and traffic diversions may occur. However, based on the relatively low existing and project related traffic, both during construction and following completion of the proposed pipeline replacement and wastewater treatment facility, traffic is not considered to be a significant impact with respect to total trips. Figure 7.x shows the streets that will be affected by the proposed project.

**3. Impacts of Proposed Phase 1 Project Improvements**

There will be short-term impacts to traffic during the construction period of the Phase 1 project improvements, including increased construction-related traffic from, the movement of materials and equipment as well as the construction personnel who will typically arrive at 7:00 a.m. and depart at 4:00 p.m. The traffic generated by these activities will be short-term and insignificant since there are relatively few roads surrounding the project site that will be affected. The following streets will be impacted by construction-related traffic:

| **Water Distribution System** | | |
|---|---|---|
| Cattle Call Drive | De Anza Place | S. Rio Vista |
| Andrita Place | Brawley Avenue | S. First Street |
| S. Western Avenue | Magnolia | Adler |
| D Street | E Street | A Street |
| N. Imperial Avenue | N. Fifth Street | N. Seventh Street |
| S. Fifth Street | Malan Street | S. Tenth Street |

| | | |
|---|---|---|
| S. Plam Avenue | K Street | S. First Street |
| J Street | I Street | Vine Avenue |
| K Street | S. Eastern Avenue | N. Adams |
| C Street | N. Ninth | Main Street |
| E Street | S. Sixth Street | Julia Drive |
| **Wastewater Collection System** | | |
| Central Plaza | Majorie | Sycamore |
| Rio Vista | Tenth Street | Fifth Street |
| A Street | Malan Street | Riverview |
| Shank Road | Julia | Eastern Avenue |
| C Road | Hwy 78/111 | |

**4. Mitigation Measures**

There are no significant impacts to traffic from the Proposed Action or Phase 1 Project Improvements, therefore no mitigation measures are required

**Growth Inducement**

**1. Impacts of Proposed Action**

The California Environmental Quality Act (CEQA) defines growth inducement to include projects which remove obstacles to growth and accommodate additional population or construction, such as expansion of public service facilities. While the proposed project would entail the expansions of wastewater plant improvements and new pipeline, these proposed improvements are designed to provide an adequate supply of potable water and sewer service in accordance with the City's established goals for growth and economic development, and to meet state and federal water quality standards and, therefore, are not considered growth inducing.

Adoption and implementation of the Brawley Water and Wastewater Master Plans will not cause growth but the Master Plans will enable the provision of water and sewer service to future development. The objective of the Brawley Water and Wastewater Master Plans is to anticipate the projected growth and provide a framework to manage new development projects and minimize local and regional environmental impacts.

The Brawley Water and Wastewater Master Plans, which meet state and federal standards, are not considered growth inducing since the Brawley General Plan states the City's desire to accommodate growth in designated areas while limiting development in areas of environmental sensitivity or where public safety hazards exist.

**2. Impacts of Proposed Phase 1 Project Improvements**

Phase 1 Project Improvement projects would not be considered growth inducing, as they are in response to existing conditions. The Water and Wastewater Master Plans show that existing water distribution pipeline and wastewater collection pipeline need replacement to meet existing water and wastewater demands.

The proposed project would entail construction of wastewater treatment plant improvements; however, these proposed improvements are not designed to provide wastewater treatment in excess of the City's established goals for growth and economic development. Instead, the proposed project seeks to improve the quality of the City's water so that it meets state and federal standards.

**3. Mitigation Measures**

No mitigation measures are required

**Cumulative Impacts**

NEPA 1508.7 states that: A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulative impacts have been analyzed for all subjects above. Impacts, which include the wastewater treatment plant expansion, an upgrade to the wastewater collection system, upgrades to the water distribution system and future expansion of the water treatment plant. The implementation of the Master Plans would contribute to the degradation of regional air quality and traffic conditions. These impacts would result from the proposed construction activities at the treatment facility and proposed installation of distribution pipelines along area roadways. Traffic control plans will reduce traffic congestion in roadways used for the location of distribution piping and air quality control measures will reduce impacts during construction. Based on the short-term nature of the impacts, there are no significant impacts based upon the projects recommended by the Master Plans.

**1. Significant Unavoidable Adverse Effects**

There are no significant unavoidable or adverse effects due to the Water and Wastewater Master Plans.

**2. Relationship Between Local, Short Term Use of the Environment and the Maintenance/Enhancement of Long Term Beneficial Uses**

Adoption of the Water and Wastewater Master Plans and Phase 1 project improvements would be a beneficial environmental use. Implementation of these master plans would require construction of pipelines and the expansion of water and wastewater treatment facilities. The majority of these system improvements would occur in roadways and previously disturbed land. Implementation of Plan recommendations would not restrict beneficial land uses. The Wastewater Master Plan would provide a long-term facilities and services plan to guide expansion and improvements. Adoption of the Water and Wastewater Master Plans would allow a greater number of property owners to use the water and sewer systems. This action would alleviate some of the groundwater problems and effluent levels, as discussed in the section on Impacts of Proposed Action to Hydrology/Water Quality

**3. Irreversible and Irretrievable Commitment of Resources**

Adoption of the Water and Wastewater Master Plans is an administrative action. The action would not require use of nonrenewable resources. Development would result in a long-term and possibly irreversible commitment of energy and other resources connected with site development and operations. Build-out of the proposed action represents a long-term commitment for a variety of resources, thus increasing energy demands related to project construction, lighting, heating and transportation of people to and from the site. Construction projects including Phase 1 improvements would require commitment of additional natural resources including lumber and forest products, sand and gravel, asphalt, petrochemicals, and other construction materials

**Transboundary Aspects** These projects are not believed to involve any negative transboundary environmental impacts and will contribute to a reduction of the potential health risks associated with an overloaded water system, wastewater system. The discharge from this facility flows to the Salton Sea via the New River, all of which lies within the U.S. boundary. This project will have no transboundary environmental effects.

## C. Compliance with Applicable Environmental and Cultural Resource Laws and Regulations

The approving agency for the environmental laws and regulations is the USEPA. The contact person and address are:

Mr. Carlos Quintero

Environmental Protection Agency, Region 9

75 Hawthorne Street

San Francisco, CA

The NPDES Permit Order Number 95-014, NPDES Number CA104523 (Appendix 12), presently in effect for the City of Brawley's Wastewater Treatment Plant expires March 29, 2000, five years from effective date. The City of Brawley is in the Colorado River Basin Region of the California Regional Water Quality Control Board. The contact address is:

Executive Director

California Regional Water Quality Control Board

Colorado River Basin Region

73-720 Fred Waring Drive, Suite 100

Palm Desert, CA 92260

## *A.* Appropriate Technology

***Project Specifications***. The project specifications for water supply (distribution), the wastewater treatment and collection system are detailed in the Master Plan which used the population growth and land use projections in the City of Brawley's General Plan. The existing population is estimated at 21,000 and buildout of the City to 42,000 is estimated to occur in year 2020.

The study area includes the incorporated City of Brawley as well as the surrounding area that is within the City's current Sphere of Influence, as described in the City's 1995 adopted General Plan. The total area covers 15,469 acres or 24.2 square miles. In addition to the incorporated City, this area includes the proposed Luckey Ranch Development and the special study areas such as North Airport, East Bend Road, Southeast Malan, East Highway 86, Downtown, and West Airport

**Water Supply (Distribution).**

**Water Distribution System Analysis (See Figure 3-1):**

Both the existing and future conditions have been analyzed by Pountney for average annual demand, peak hour, and maximum day plus various fire conditions. All of the system modeling computer runs were made in the Extended Period Simulation mode. For the peak hour runs, the system was analyzed for one hour. For the Average Annual Day (AAD) and Maximum Day plus fire (MDF) runs, the system was analyzed for 24 hours to verify how the pumps and tanks operate. In the 24-hour runs, a typical hourly demand chart was input into the model to simulate varying demands throughout an average day. (The hourly chart is per The American Water Works Association (AWWA) Manual M3 1, Distribution System Requirements for Fire Protection). Based on this chart, the highest demands during a 24-hour period occur at 8:00 PM and have a, factor of 1.6, while the lowest demands occur between 2:00 AM and 5:00 AM, with a 0.5 factor.

For both the existing and future conditions, demands were calculated for individual land use areas and then the demand was separated between modeled junctions that were located within that land use area. These demands were then inserted into the computer model (See Table 4-0).

Since the certification is for the Phase 1 rehabilitation of existing conditions, only the existing conditions specifications will be presented.

**Design Criteria**

The pertinent design criteria used for the Water System Master Plan are shown in Table 4-0.

*TABLE 4-0 WATER SYSTEM DESIGN CRITERIA*

| Item | Value | Reference/Source |
|---|---|---|
| *Existing Treatment Plant Flow* | *7.2 MGD* | *Existing City of Brawley Meter Data* |
| *(Average Annual Day Demand* | *to 7.4 MGD* | |
| *Peaking Factors:* | | |
| *Peak Hour* | *2.9* | *City of San Diego (1) (2)* |
| *Max Day* | *1.6* | *Existing water meter data/discussion with WTP operator* |
| *Existing Water Demand rates:* | | |
| *Residential* | *259 gpd/pers* | *Luckey Ranch EIR* |
| *Comercial* | *2,000 gpd/acre* | *See note (3).* |
| *Industrial* | *3,500 gpd/acre* | *See note (3).* |
| *Public Facility* | *2,000 gpd/acre* | *See note (3).* |

| | | |
|---|---|---|
| *Existing Land Use Densities:* | | |
| *Mobile Home Park* | *15.6 du/net ac.* | *Brawley General Plan, Land Use Element* |
| *Low Density Residential* | *6.5 du/net ac.* | *Brawley General Plan, Land Use Element* |
| *Medium Density Residential* | *33.8 du/net ac.* | *Brawley General Plan, Land Use Element* |
| *Future land Use Densities:* | | |
| *(except for Luckey Ranch)* | | |
| *Rural Residential* | *1.2 du/net ac.* | *Brawley General Plan, Land Use Element* |
| *Low Density Residential* | *5 du/net ac.* | *Brawley General Plan, Land Use Element* |
| *Medium Density Residential* | *13 du/net ac.* | *Brawley General Plan, land Use Element* |
| *Existing Population per DU* | *2.87 pers/du* | *Luckey Ranch EIR* |
| *Fire Flows:* | | |
| *Residential - single family* | *2,000 gpm* | *City of San Diego (1)* |
| *Residential - multi family* | *3,000 gpm* | *City of San Diego (1)* |
| *Commercial* | *4,000 gpm* | *City of San Diego (1)* |
| *Industrial* | *6,000 gpm* | *City of San Diego (1)* |
| *Fire Flow Duration* | *5 hrs* | *City of San Diego (1)* |
| *System Pressures* | | |
| *Peak Hour* | *40 psi, min* | *City of San Diego (1)* |
| *Maximum Day + Fire* | *20 psi, min* | *City of San Diego (1)* |
| *Static* | *60 psi, min* | *City of Brawley* |
| *Velocity:* | | |
| *Maximum Velocity During Fire* | *15 fps* | *City of San Diego (1)* |

(1) Taken from City of San Diego Water & Sewer Design Guide, September 8, 1994

(2) Peak Hour Peaking Factor was taken from City of San Diego graph with 7.4 MGD AAD and 1.6 Maximum Day Peak Factor

(3) Rate has been calculated based on the AAD of 7.4 MGD

**Existing System Calibration**

The existing water system model, which includes the existing Water Treatment Plant (WTP) pump station, was calibrated by comparing some of the pressures recorded during the City's fire hydrant testing with the pressures developed by the model. The Hazen Williams roughness coefficient C and/or the pipe diameter in areas in which the pressures did not match closely was then adjusted. A C factor of 100 (typical for cast iron pipe over 20 years old) was used for all cast iron pipes and C factors of 140 and 150 were used for the AC and PVC pipes, respectively. With these factors, the majority of the recorded pressures that were checked were within 6 psi of the modeled pressure.

Of the areas checked, there were only two that did not fall within the 6 psi range. One was at 245 Magnolia and required that pipe # P-602 be modeled as a 2" diameter pipe. (A 2" diameter is the smallest pipe that the computer can model.) The other, on Vine Street adjacent to the Miguel Hildago Grammar School, had a recorded pressure of 28 psi at one hydrant and roughly one half block away another hydrant had a recorded pressure of 44 psi. The modeled pressure at both locations was 54 psi. The cast iron pipes in the vicinity of the low pressures were changed to 2" diameter pipes but the model still could not obtain the 28 psi and 44 psi. As the conditions under which the fire hydrant pressures were recorded are unknown (i.e., time of day, peak flow, max day), the 44 psi is deemed to be within an acceptable range of the modeled pressure. As for the 28 psi, it is possible the fire hydrant and/or the pipe in the vicinity of the fire hydrant may be plugged.

**Existing System Analysis**

The existing water system analyses were made using the calibrated existing distribution piping and the 1999 water treatment pumps and reservoirs. The following presents a discussion of each of the computer runs along with minimum system pressures (excluding nodes on the suction and discharge sides of the pump stations). Maximum pressures are only given for the AAD runs, as it is a pumped system and the maximum pressure does not vary significantly.

Existing Average Annual Demand: This is the existing AAD run, which includes a total 7.5 MGD demand on the system.

Minimum Pressures:

EA-16 55.5 psi

JO-11 55.6 psi

EA-15 55.6 psi

(These junctions are on Eastern Avenue just south of the Airport.)

Maximum Pressures:

WTP-3 71.8 psi

WTP-4 71.8 psi

(These junctions are at the 1999 Water Treatment Plant.)

Existing Peak Hour Demand: This is the existing PH run, which includes a total 21.7 MGD demand on the system.

Minimum Pressures:

EA-16 42.1 psi

JO-11 42.1 psi

EA-15 42.1 psi

(These junctions are on Eastern Avenue and Duarte Street just south of the Airport.)

Existing Maximum Day Plus Fire at Junction KB-3: This is the existing MDF run, which includes a 6,000 gpm industrial fire at Junction KB-3, as well as a maximum day demand of 12.0 MGD. (The peaking factor is 1.6.) Junction KB-3 is the Brawley Municipal Airport. (Several runs were made simulating fires at various junctions and this location had some of the worst pressures.)

Pressures shown are at 8:00 PM, when demands are the highest.

Minimum Pressures:

KB-3 -337.1 psi (negative)

KB-2 -119.5 psi (negative)

KB-I - 53.3 psi

(These junctions are in Ken Bemis Drive at the Airport.)

Existing Maximum Day Plus Fire at Junction EA-1 6: This is the existing MDF run, which includes a 6,000 gpm industrial fire at Junction EA-16, as well as a maximum day demand of 12.0 MGD. (The peaking factor is 1.6.) (Several runs were made simulating fires at various junctions and this location had some of the worst pressures.) Pressures shown are at 8:00 PM, when demands are the highest.

Minimum Pressures:

EA 16 - 1,069 psi (negative)

JO-11 - 736 psi (negative)

EA-15 - 736 psi (negative)

(These junctions are on Eastern Avenue and Duarte Street, just south of the Airport.)

**Existing System Modifications**

The existence of negative pressures in a water system can result in pipe collapse, the introduction of contaminated water into the system from cross-connections, and the inability to meet user demands. Such conditions are not acceptable in a public water system. To eliminate these conditions, modifications to the system were made, and the model was rerun including the AAD, MDF, and Peak Hour (PH) conditions. The pipe modifications are shown in Appendix 13 and generally, include the following:

- Replace all existing 4", 6", and 8" cast iron pipe with 8" PVC minimum. All larger diameter cast iron pipes should be replaced with PVC pipe of the same size. The existing cast iron pipe is as much as 65 years old and has shown signs of significant tuberculation, which has decreased the capacity of the pipes and increased headloss through the pipe. The 4" and 6" pipes are replaced with 8" minimum, as 4" and 6" pipes do not typically have the capacity to provide adequate fire flows and velocities. It is typical to use 8" minimum water pipes except in unlooped, short cul-de-sacs.
- Replace all cast iron pipe which lies in a commercial or industrial zone with 12" PVC. To provide adequate fire flows and velocities in industrial and commercial areas, minimum 12" diameter pipes are used.
- Increase the existing 8" AC pipe in Malan and Best Canal Road to 12" PVC from Junction NLAL29 to BC- 1 and BCI to BC-7. Increasing the pipe to 12" allows more water to be delivered, at a higher pressure, to the area in the vicinity of the airport.
- Replace the 6" AC in River Drive near HWY 111 and in HWY 111 north of River Drive with 12" PVC from Junction 7d-3 to RIV- 14, Junction RIV- 13 to H 111-2, and Junction SH- 1 to SH-2. These pipes have been increased in diameter, as they feed industrial and commercial areas and provide additional flow and pressure to the area along Route 111.
- Replace the 6" AC (in the vicinity of the airport) with 12" PVC from Junction EA-11 to BC-7, Junction KB- 1 to KB-3, Junction KB-2 to JO- 15, Junction JO-14 to JO- 15, Junction EA-7 to EA16, Junction EA-8 to BC-6, MA-25 to BC-3, and MA-22 to MA-23. These pipes feed industrial and commercial areas and provide additional flow and pressure to the area in the vicinity of the airport.

**Existing Water System Considerations**

In general, to meet existing water demand requirements, it is proposed that the existing distribution pipe system be upgraded. These considerations include the following:

1. All cast iron pipe should be replaced with a minimum 8" diameter pipe. The cast iron pipe is roughly 40 to 60 years old and, those areas that have been replaced in the past, has shown significant tuberculation. Replacing these pipes provides increased flow capacity to help meet the existing water demand requirements.

2. Cast iron pipe located in industrial and commercial areas should be replaced with minimum 12" diameter pipe. In industrial and commercial areas, minimum 12" diameter pipes are required to provide adequate pressure and velocities during fire flow conditions. Although a few pipes supplying industrial fire areas have velocities slightly over 15 fps (17 and 18 fps), it is not proposed that these pipes be increased to diameters larger than 12", as the duration of a fire would likely be short and the difference in resulting velocity is minimal.

3. Based on the existing conditions, the existing water main in Malan from Eastern to Best Canal Road and in Best Canal Road from Malan to Jones Street should be increased in size to a 12" diameter main. To meet future demand conditions imposed by the Luckey Ranch development, this pipe, ultimately, must be increased to 18" diameter. To preclude duplicate construction, the 18" diameter pipe should be installed under the existing conditions.

4. To provide adequate fire flows, pipes in industrial/commercial areas should be replaced with 12" diameter mains. 12" diameter mains are required to provide minimum pressures of 20 psi and maximum velocities of 15 fps. A few pipes have velocities slightly over 15 fps, but are not proposed to be increased in diameter to more than 12", as the difference in resulting velocity is minimal.

5. In the residential area west of the airport (Duarte Street, Rubio Street, Jones Street and Trail Street), the existing 6" AC pipes should be considered for upsizing to 12". Although these pipes are in a residential area, a 12" diameter is required to provide adequate pressure during a fire. As an alternative to replacing these pipes, a looped system could be provided by installing a new 12" pipe from the west end of Duarte (Junction No. DU-6) south to River Drive (Junction No. RIV- 19) and then connecting the other three streets to this line.

6. The existing 6" AC in Julia Road between Junctions JU-5 and J-U-6 should be replaced with a 12" main. This section of pipe is the only 6" pipe on the 12" looped system that feeds the hospital area. As there is some question that this pipe may already be 12" and, therefore, would not require replacement, the pipe should first be potholed and the size verified.

**Existing System Reliability**

To improve system reliability, it is proposed that a portion of the new 36"/24" line from the 1999 WTP be paralleled and that additional connections from the 36"/24" line be made to the local distribution pipes. If the 36"/24" pipe is taken out of service, the only water available to supply demands is the 0.25 MG elevated tank and the 3 MG booster tank. The booster tank and pump station are not adequately sized to handle large demands and would be of limited value in an emergency. At a minimum, three connections between the existing 24" and the distribution pipes should be made, possibly one each at Junction Nos. CA- 11, K-8, and 1-3. The new parallel pipe should be 24" minimum and should parallel the 36" portion of the 36"/24" line. (From the 54" at Junction No. WTP-3 to Junction No. WTP-4 at Cattle Call Drive.)

**Existing System Operation**

To improve overall system operation, the booster tank should be operated so that it draws down and fills at least partially each day. Using this tank daily will assure that the stored water is circulated, as well as help prevent the loss of disinfectant residual. To provide the maximum amount of emergency storage in the system, this tank should be kept full when possible.

To improve flow in and out of the tank, a separate inlet pipe to the tank should be constructed. (The tank currently has a single inlet/outlet pipe.) The pipe should include an altitude valve with delayed closing. A delayed closing valve closes when the tank is full and opens when the water level in the tank reaches a preset level.

Discussions with City of Brawley personnel have indicated that they have had problems in the past with the operation of the booster facilities and continue to have low pressures in and around the airport area. If the construction of the new inlet pipe and altitude valve and operating the tank daily does not considerably improve the system operation, consideration should be given to isolating this area from the rest of the distribution system. This would typically require installation of gate valves at the edges of the newly created zone, installation of additional pumps to increase the station capacity, and installation of a back up system (i.e., diesel operated pumps or generator).

**Raw Water Supply**

Currently, the City's raw water is supplied by a single source from the Imperial Irrigation District. If this source is taken out of service for an extended length of time, the City would be without water. To remedy this situation, the City should consider obtaining a second source of raw water, possibly by constructing a secondary raw water line from the existing IID Fudge Reservoir that is located approximately 2 miles to the south of Brawley.

**Implementation Of Capital Improvements**

Design and construction of the proposed existing water system capital improvements are proposed to be phased over the next 20 years. These improvements are divided into four 5-year phases, which allow for the construction of facilities at a fairly steady pace without severely taxing the City's revenues at any one time. The Phase I improvements, to occur over the next five years, will be certified (see Appendix 13). It is proposed that the Phase 2, 3, and 4 improvements be spread over the remaining 15 years at roughly $1 million a year, except for years 6 and 7, which would have slightly lower costs of $500,000 to $600,000, respectively.

**Phase 1 (Certified) Improvements (Years 1999 Through2004)**

The proposed Phase 1 improvements should be scheduled for construction by the year 2004 (see Appendix 13). These improvements, which include replacement of all the 4"diameter cast iron pipe and a portion of the 6" diameter cast iron pipes, have been given the highest replacement priority. Even a small degree of tuberculation on small diameter pipes could significantly decrease pipe capacity, as well as create major adverse effects on system pressures and velocities. Of the cast iron pipe replacements, it is proposed that the existing 4" and 6" cast iron pipes, which are proposed to be upsized to 12", be replaced first. Because these pipes lie within or serve industrial/commercial zones, the overall system would benefit the most from their replacement.

Since there are currently plans to develop the area near the hospital, it is also proposed in this phase that the existing 6" AC in Julia Road, between Junctions JU-5 and JU-6, be replaced with a 12" main. There is some question that this pipe may already be 12" and, therefore, would not require replacement. The pipe should first be potholed and the size verified.

A 20-year capital improvements plan was developed and divide into four five-year phases to address system deficiencies. At this time, certification is being sought for the first phase only, as the actual implementation of the following phases will be based on actual City growth and development patterns. The four phases can be briefly summarizes as follows:

| PHASE | DESCRIPTION | ESTIMATED COST |
|---|---|---|
| Phase 1 | • 4- and 6-inch cast iron pipe replacement<br>• Po Colonia pipe replacement<br>• La Colonia pipe replacement | $3.65 million<br>$0.44 million<br>$1.52 million<br>Total = $5.61 million |
| Phase 2 | • Replacing of remaining 6-inch CIP | $4.2 million |
| Phase 3 | • Replacing 8- and 12-inch CIP | $4.81 million |
| Phase 4 | • Replacing 14- though 24-inch CIP<br>• Replacement of asbestos cement pipes with inadequate capacity | $4.81 million |

The proposed technology for the rehabilitation of water lines is appropriate. PVC pipe will reduce leakage in the system and will be more resistant to corrosion than other alternatives. The alternatives analyzed for pipe rehabilitation were limited to the different pipe materials that could be used. It was decided by the consultant that all new lines should be constructed with PVC pipe.

The following table summarizes the recommended improvements for Phase 1.

**Summary of Proposed Improvements to the Water Distribution System**

| Description | Length (feet) | Estimated cost ($) |
|---|---|---|
| Replace 4-inch CI pipe with 8-inch PVC | 20,174 | $1,446,476 |
| Replace 6-inch CI pipe with 8-inch PVC | 8,595 | $615,350 |
| Replace 6-inch CI pipe with 12-inch PVC | 8,627 | $833,405 |
| Replace 4-inch CI pipe with 12-inch PVC | 1,950 | $199,680 |
| Replace 6-inch AC pipe with 12-inch PVC | 281 | $27,201 |
| **Subtotal (including engineering & overhead)** | **39,627** | **$3,647,928** |
| Po Colonia replacement | 3,209 | $447,327 |
| La Colonia replacement | 10,093 | $1,520,647 |
| TOTAL | 52,929 | $5,615,902 |

Please note that the improvements for Po Colonia and La Colonia refer to the replacement of lines within the City of Brawley that are necessary to ensure adequate flow to the two mains serving the colonias. The two mains will originate at the city limits and will be financed independent of this project by USDA.

## Wastewater Treatment

### Design Criteria

WESTON evaluated various alternatives for the future Wastewater Treatment Plant (WWTP) improvements based on projections in this Master Plan. The alternatives were based on design criteria considered as good engineering practice and relative to the City's specific needs including geographic location, climate, availability of nearby resources and discussions with nearby cities and their WWTP operations experience. Discussions were conducted with the cities of El Centro, Calexico, Calipatria, and Niland. WESTON also discussed the future NPDES permit requirements with Mr. Narendra Khilnani, the CRWQCB's engineer assigned to the City. Design criteria established for the alternatives analysis are summarized in Table 4-1.

**Table 4-1**

**Design Criteria**

| | *Year Projections* | | | |
|---|---|---|---|---|
| *Design Criteria* | *1999 (Current)* | *2000* | *2010* | *2020* |
| *1. NPDES Permit Requirements* | | | | |
| *a. Flow Rate (MGD)* | *3.9* | *N/A* | *N/A* | *N/A* |
| *b. Effluent BOD (mg/1)* | *45* | *45* | *45* | *45* |
| *c. Effluent TSS (mg/1)* | *95* | *95* | *95* | *95* |
| *d. Settleable matter (ml/1)* | *0.3* | *0.3* | *0.3* | *0.3* |
| *e. Disinfection (Fecal Coliforms, per 100 ml)* | *N/A* | *200* | *200* | *200* |
| *2. Influent Flow* | | | | |
| *a. Design ADF (MGD)* | *3.9* | *4.5* | *7.5* | *12.0* |
| *b. Peak Wet-Weather (MGD)* | *12.9* | *13.8* | *18.1* | *24.0* |
| *c. BOD (mg/1)* | | | | |
| *Average Month* | *130* | *130* | *130* | *130* |
| *Design Criteria* | *1999 (Current)* | *2000* | *2010* | *2020* |
| *Maximum Month (July)* | *170* | *170* | *170* | *170* |
| *d. TSS (mg(l)* | | | | |
| *Average Month* | *150* | *150* | *150* | *150* |
| *Maximum Month (July)* | *230* | *230* | *230* | *230* |
| *3. Sludge Production* | | | | |
| *a. Dry Weight (ppd)* | | | | |
| *Average Month* | *4,530* | | | |
| *Maximum Month (July)* | *6,910* | | | |
| *b. At 5% solids (gpd)* | | | | |
| *Average Month* | *10,900* | | | |
| *Maximum Month* | *16,600* | | | |

### Phasing of Improvements

The ultimate flow projection developed in the Wastewater Master Plan for the City is 12.0 MGD Average Daily Flow. Since the existing WWTP capacity is 3.9 MGD, the plant capacity must be increased 8.1 MGD (12.0 MGD - 3.9 MGD) over this 20 year period. This expansion will be constructed in "phases", rather than at a single time, to be cost-effective by coinciding increased plant capacity with the actual development and growth of the City. For construction phasing evaluation, WESTON focused on increments of capacity increase which are standard in the industry. The phasing alternative considered most favorable was the three phases alternative. BECC certification will be pursued only for Phase 1 of the proposed improvements.

### Process Alternatives For Ultimate Facilities

WESTON evaluated four treatment process alternatives for this WWTP Master Plan. The four treatment processes evaluated were: no action, aerated lagoon, combination aerated lagoon and activated sludge, and aerated lagoon with reclaimed water. WESTON selected these alternatives for review based on the overall treatment objectives and suitability for the City's needs. An evaluation matrix is provided in Table 4-2 below.

**Table 4-2**

**Process Alternatives Evaluation Matrix**

| *Item* | *Criteria* | | *Process And Scoring* | | |
|---|---|---|---|---|---|
| | | *Weighting Factor* | *Aerated Lagoon* | *Lagoon/ Act Sludge* | *Lagoon/ Rec. Water* |

| | | | | | |
|---|---|---|---|---|---|
| *1.* | *Reliability of system and components* | *2* | *8* | *6* | *6* |
| *2.* | *Flexibility to operate under changes in flow or upset conditions* | *2* | *8* | *6* | *4* |
| *3.* | *Complexity in maintaining/controlling process* | *2* | *8* | *6* | *6* |
| *4.* | *Area requirements* | *1* | *3* | *3* | *1* |
| *5.* | *Safety to operators* | *2* | *8* | *6* | *6* |
| *6.* | *Constructability* | *1* | *4* | *3* | *2* |
| *7.* | *Staffing requirements* | *1* | *4* | *3* | *3* |
| *8.* | *Power requirements* | *1* | *5* | *3* | *2* |
| *9.* | *Capital Costs* | *2* | *10* | *6* | *2* |
| *10.* | *0 & M costs* | *2* | *8* | *4* | *2* |
| *11.* | *Environmental impact potential* | *2* | *8* | *8* | *2* |
| *TOTAL SCORE* | | | *74* | *54* | *36* |

*NOTE: Scoring based on a scale from I to 5 with 5 being "most favorable" and 1 being "least favorable." Score is multiplied by the weighting factor.*

**Aerated Lagoon Process Alternative: The "Most Favorable" Alternative**

The aerated lagoon treatment process is the system currently utilized at the WWTP. This system basically consists of the following steps:

Screening and grit removal (headworks),

Primary clarifiers,

Aerated lagoons,

Stabilization ponds, and

Discharge to New River.

The design of this process is summarized in Table 4-3 and is based on a three phase implementation plan consisting of 2 MGD, 3 MGD, and 3 MGD to obtain the ultimate 12 MGD capacity. The certification phase is Phase 1, expansion of the treatment process by 2 MGD. A layout of these required facilities is shown in Figure 4-1.

**Table 4-3**

**Required Facilities - Aerated Lagoon Process Alternative**

| **Phase I - 2 MGD Expansion (6 MGD Total Capacity)** | | | |
|---|---|---|---|
| *Item* | *I Component/Equipment* | *I Description* | *Comment* |
| *1. ,* | *Headworks* | *One structure* | |
| | | *Demolish existing structure* | |
| | | *One manual trash rack 3-inch* | |
| | | *Openings* | |
| | | *One traveling band screen,* | |
| | | *6 mm opening, I BP* | |
| *2.* | *Grit Basin* | *One new structure, 15-foot long* | |
| | | *by 15-foot wide by 9 foot deep.* | |
| *3.* | *Primary Clarifiers* | *2 at 70-foot diameters with* | *Consider installing one clarifier at* |
| | | *12-foot Side Water* | *90 foot diameter with 12-foot SWD.* |
| | | *Depth (SWD)* | *Evaluate dual weirs to reduce weir* |
| | | *4 sludge pumps, 500 gpm* | *loading during design.* |
| *4.* | *Capital Cost* | *a $6,500,000* | |

**Disinfection Alternative (Phase 1A Certificaton Project)**

WESTON evaluated three disinfection process alternatives for this WWTP Master Plan. They are:

- Chlorination/Dechlorination (gas system)
- Sodium Hypochlorite (bleach)/Sodium Bisulfite,
- Ultraviolet

WESTON selected these alternatives for review based on the overall treatment objectives and suitability for the City's needs. Each process evaluation is described in more detail below. An evaluation matrix is provided in Table 4-4 which summarizes the comparison of these alternatives.

**Ultraviolet (UV) The "Most Favorable" Disinfection Alternative**

This type of disinfection utilizes ultraviolet light to disinfect wastewater. The following design parameters were used:

- ADF of 6, 9, and 12 MGD
- Peak flows of 16, 20, and 24 MGD, and
- Wastewater effluent stream with a total suspended solids (TSS) of 95 mg/L and BOD of 45 mg/L.

It is important to point out that the 95 mg/L concentration for TSS is based on the effluent limit required by the NPDES permit, and does not correspond to observed values, which varied from 22 to 66 mg/L from January 1997 to October 1998, with an average monthly value of 37 mg/L.

WESTON contacted David Schwartzel with Trojan Technologies UV Systems to aid in the evaluation of ultraviolet systems for disinfection. The concern with using this type of disinfection is the high TSS in the wastewater. At such a high TSS, UV manufacturers were concerned that their systems would not be able to disinfect the wastewater. All contacted manufacturers suggested field tests be performed before making a final recommendation.

Generally, most UV systems are designed to handle TSS in the range of 30 mg/L or less. The higher suspended solids provides shelter from ultraviolet light for the infectious organisms. In most cases, however, this 30 mg/L or less is designed for an effluent quality of 2 fecal coliforms/100 ml or less to meet California's Title 22 Regulation. The City will not have to meet Title 22 and therefore its effluent discharge limit is 200 fecal coliform/100 ml or less .

The required discharge limit for coliforms is approximately 100 times higher than most effluent discharge limits and, according to Mr. Scwhartzel, has logarithmic effects on the design of the UV system. Mr. Schwartzel, has experience with lagoon systems and was one of the researchers in the Calexico WWTP's UV investigation. In his opinion, meeting the 200 fecal coliform/100 ml should not be a problem, but field tests on Brawley's WWTP influent and effluent must be conducted to confirm this. The Calexico WWTP differed from Brawley's in that instead of being strictly an aerated lagoon system, it contained both an activated sludge and an aerated lagoon system. The discharge limits for this plant were set at 126 fecal coliform/100ml.

The major advantages of an ultraviolet disinfection system is safety in operation, no chemicals requirements, and relatively low capital and O&M costs.

However, there are major disadvantages to all ultraviolet disinfection system:

Reliability at high TSS is still in question (field tests required),

Sensitivity to variances in the characteristics of the wastewater,

Handling of the lamp apparatus,

Must contract current applications of UV System for disinfection in aerated lagoon systems,

Amount of money spent on the power to operate this disinfection system.

Results from the evaluation matrix (Table 4-4) indicate that utilizing the UV system would be the "most favorable' alternative. However, scoring for the UV system should be reevaluated following a minimum 30 day pilot testing period. Actual field conditions and field results should confirm the effectiveness of the UV system on the City of Brawley's effluent stream. This pilot testing should be conducted during the design phase of the system.

The capital cost for UV disinfection are estimated at $673,000, while the present worth cost for the next 20 years was estimated at $1,134,131. These figures can be compared to the capital cost for gas chlorine disinfection (plus dechlorination) of $1,150,000, and a present worth of $6,571,251. Cost for hypochloride disinfection are even greater. The substantial potential savings of UV over chlorination, (in the order of $5.4 million over the life of the project,) make the recommendation of this alternative, pending pilot testing, acceptable. Table 4-5 shows a comparison of cost estimates for the three disinfection alternatives.

**Table 4-4**

**Disinfection Alternatives Evaluation Matrix**

| | | *Disinfection alternatives* | | |
|---|---|---|---|---|
| *Consideration* | *Weighting Factor* | *Chlor./Dechlor. (Gas System)* | *Sod. Hyp. (Bleach)/ Sod. Bisult* | *Ultraviolet* |
| *1. Effectiveness of Disinfection System (ability to achieve target levels)* | *1* | *5* | *5* | *5* |
| *2. Equipment Reliability* | *2* | *10* | *10* | *8* |
| *3. Reliability at TSS=95* | *2* | *8* | *8* | *2* |
| *4. Flow Proportional* | *1* | *4* | *4* | *4* |
| *5. Complexity of Technology* | *1* | *4* | *4* | *4* |
| *6. Safety Concerns* | *2* | *2* | *4* | *8* |
| *7. Sensitivity to Fluctuations in Effluent Stream (changes in BOD, TSS, chemical constituents, etc.)* | *1* | *5* | *5* | *2* |
| *8. Adjustability to meet Fluctuations in Effluent Stream* | *2* | *8* | *8* | *4* |
| *9. Chemical/Lamp Handling* | *1* | *3* | *3* | *3* |
| *10. Similar Process Application (References)* | *1* | *5* | *5* | *3* |
| *11. O&M Requirement* | *2* | *6* | *6* | *6* |
| *12. Fish Toxicity* | *1* | *4* | *4* | *5* |
| *13. Chemical Transportation to Site* | *1* | *3* | *3* | *5* |
| *14. Corrosive* | *1* | *2* | *3* | *5* |
| *15. Power Use* | *2* | *8* | *8* | *6* |
| *16. Equipment Cost* | *2* | *8* | *8* | *8* |
| *17. Installation/Structural Cost* | *2* | *2* | *4* | *8* |
| *18. Annual O&M Costs* | *3* | *6* | *3* | *12* |
| *TOTALSCORE* | | *93* | *95* | *98* |

*NOTE: Scoring based on a scale from 1 to 5 with 5 being "most favorable' and I being "least favorable." Score is multiplied by the weighting factor.*

**Table 4-5**

**Cost Comparison for Disinfection Alternatives**

| Alternative | Capital Cost | Present Worth (20 years) |
|---|---|---|
| UV | $767,637 | $1,134,131 |
| Chlorination/Dechlorination | $1,150,010 | $6,571,251 |
| Sodium hypochlorite/Sodium Bisulfite | $527,385 | $7,174,323 |

**Wastewater Collection System**

The City's wastewater collection system was established more than 70 years ago. Approximately 1,500 acres of the City have a combined storm drain and sanitary system. A summary of the wastewater collection line follows:

**Wastewater Collection Line Summary**

| *Line Size (inches)* | *Total Length (feet)* |
|---|---|
| *6* | *7,696* |
| *8* | *224,040* |

| | |
|---|---|
| *10* | *14,398* |
| *12* | *10,998* |
| *14* | *1,763* |
| *15* | *31,741* |
| *18* | *21,008* |
| *21* | *29,838* |
| *30* | *398* |
| *Total Linear Footage* | *341,880* |
| *10 inch Force Main* | *7,998* |

As part of the wastewater collection system master plan developed by WESTON, a computerized hydraulic model of the sewer system was developed to identify deficiencies under several scenarios: existing dry weather, existing wet weather, future dry weather, future wet weather, and future wet weather assuming the sanitary and storm sewers will be completely saturated.

Based on the results of the model runs and other tasks, the master plan identifies system deficiencies for these five scenarios. Deficiencies were then prioritized based on the following criteria: dry weather deficiencies are more critical than wet weather deficiencies, existing deficiencies are more important than future deficiencies, projects are prioritized by the severity of the deficiency (ratio of flow to design capacity), critical deficiencies occur when flow exceeds 120% of capacity, system is a separate sanitary and storm system. A more detailed description of the evaluation process is provided below.

A capital improvements plan was then developed for the identified deficiencies. The 20-year plan was divided into four 5-year phases. The proposed improvements include both rehabilitation of existing lines and construction of new lines to serve future growth areas. Nonetheless, at this time only certification for the first phase is being sought, which comprises only the rehabilitation of existing lines.

Two alternatives were evaluated for the rehabilitation of lines. The rehabilitation method for lines located in congested areas within the City will be accomplished by removal and replacement of the existing line. The rehabilitation method for lines in areas predominantly undeveloped will be by means of parallel lines.

Phase 1 includes the replacement of 21 lines with a total length of 6,200 feet. The replacement lines will have diameters ranging from 12 to 18 inches. The following table summarizes the recommended improvements for Phase 1.

**Summary of Proposed Improvements to the Wastewater Collection System**

| | | | | |
|---|---|---|---|---|
| DescriptionCentral Plaza | 1 | 210 | 8 | 18 |
| Central Plaza | 4 | 920 | 8 | 15 |
| Central Plaza | 4 | 1,160 | 8 | 12 |
| Central Plaza | 2 | 970 | 10 | 15 |
| Oakley Canal | 1 | 70 | 21 | 30 (parallel line) |
| Rio Vista | 1 | 150 | 12 | 18 |
| Rio Vista and West Main | 1 | 490 | 8 | 18 |
| Tenth St. | 7 | 2,230 | 10 | 18 |
| TOTAL | 21 | 6,200 | | |

The total cost of the rehabilitation program for phase 1 has been estimated at $772,736.

The proposed wastewater collection technology (i.e. gravity PVC pipe) is appropriate for the conditions of Brawley as it will reduce leaks or infiltration into the system. The replacement methods proposed are also of an appropriate technology level and cost effective.

**Methodology**

The collection system capacity analysis consisted of the following major steps:

1. Develop Computer Model. The computer model on which collection system improvement recommendations were based was developed using the 2020 ultimate flow of 12 mgd. The model was developed assuming that the sanitary and storm sewers will ultimately be separate systems.

2. Identify Capacity Deficiencies in Existing Sewers. Using the future land use maps (from the General Plan), new sewer alignments at build-out (year 2020) were estimated. The model was used to simulate year 2020 flows from existing service areas and future build-out areas.

    - 1998 Dry weather Analysis Results - existing pipes.
    - 1998 Wet weather Analysis Results - calibrated to WWTP peak Q=12.9 mgd and existing pipes.

- 2020 Dry weather - existing pipes.
- 2020 Wet weather Combined and Separated System - existing pipes (2 year, 5 hour storm event).
- 2020 Wet weather Separated System - existing pipes (2 year, 5 hour storm event).
- 2020 Wet weather Separated System - designed pipes.

3. The results of the analysis identify sewers having inadequate capacities

4. Evaluate Alternatives and Future Considerations. Alternatives were evaluated as follows:

- Alternatives evaluated assume that the sanitary sewer and the storm sewer will be separate systems in year 2020.
- Deficiencies for each flow scenario evaluated were prioritized according to the degree of need for repair/rehabilitation. The severity of the deficiency is measured by the ratio of flow to allowable capacity (percent full).
- Repair/rehabilitation considerations were phased according to need and anticipated date of construction for new build-outs. Existing Dry weather deficiencies identified are considered to be in immediate need of repair/rehabilitation. Deficiencies identified in lines impacted by future Dry weather flow and future wet weather are phased, respectively.
- Alternatives were also evaluated in terms of estimated capital costs.

5. Identify Capacity Deficiencies and Size Improvements. The HYDRA model was utilized to identify capacity deficiencies in the system and to assist in sizing required improvements and in analyzing the impact of future sewer extensions.

**Capacity Analysis**

Based on the selected sanitary sewer layouts, the assumption that the storm sewer and the sanitary sewer systems would be separated, and that all wastewater would be routed to the City's WWTP, a detailed capacity analysis of the existing sewers was performed. The HYDRA model was run for existing dry conditions and future (year 2020) dry and wet weather conditions. Wherever the design flow exceeded the existing full pipe capacity, a deficiency was indicated, and relief or replacement sewers were sized and priced. The severity of the deficiency was quantified in terms of the "percent full," the ratio of the projected design flow to the maximum allowable pipe capacity at 3/4of a full pipe (d/D=0.75). The program also calculated the required size of the new sewers.

For existing development conditions, the analyses shows that approximately 33% of the modeled collection system lines are undersized when the system was simulated as a combined system calibrated to peak diurnal flow (5.1 mgd) plus 7.8 mgd. Assuming the system to be a separate sanitary and storm sewer, the following analyses were simulated and reflected the following results:

- Dry Weather Flow - approximately 4% of the modeled lines are undersized.
- 1998 Wet Weather Flow -approximately 27% of the modeled lines are undersized.
- 2020 Dry Weather Flow - approximately 16% of the modeled lines are undersized.
- 2020 Wet Weather Flow - approximately 32% of the modeled lines are undersized.

**Summary of Capacity Analysis and Relief Sewer**

As part of the capacity analysis, relief and replacement sewers were sized and their costs estimated for all deficiencies identified (i.e., pipes that the design flow exceeds the maximum allowable capacity [d/D of 0.75]). The following information was obtained for each of the pipe segments modeled.

- Priority Ranking
- Collection Sewer Name
- Manhole Information
- Line Size
- Length of Deficient Sewer
- Percent Full (ratio of flow to capacity)
- New Line Information
- Considered Method of Rehabilitation
- Cost of Repair/Rehabilitation Information

**Capital Improvement Program Consideration**

A capital improvements program was developed based on the results of the hydraulic model using the following criteria.

1. Dry weather deficiencies are more critical than wet weather deficiencies.
2. Existing deficiencies are more important than future deficiencies.
3. Projects are prioritized on the severity of the deficiency, as measured by the ratio of design flow to existing maximum allowable capacity (percent full) for each scenario evaluated.

4. A critical deficiency occurs when the flow exceeds 120% of capacity.

5. Collection system is a separate sanitary sewer and storm sewer system.

6. Recommendations are based on year 2020 wet weather flows.

Based on these assumptions, three priority categories for sewer collector mains were defined:

1. Existing Dry weather (separated system)

2. Percent full 2020 Dry weather (separated system)

1. Percent full 2020 wet weather (separated system

Rehabilitation costs include repair/rehabilitation, removal and replacement of an existing line, or construction of a parallel relief line. The certified, first phase of projects should include projects that are currently planned by the City and Construction Phase I projects. Phase I projects are existing lines that are currently undersized (over 120% full capacity). Phase I includes 21 lines in the following areas:

- Central Plaza
- Marjorie/Sycamore/Rio Vista
- Ten to Fifth Street
- A to Malan Street
- Riverview/Shank to Julia
- Eastern Ave

**Project Selection and Verification**

Projects are prioritized by Phase and ranked by percent full as shown in Appendix 14. A critical deficiency occurs when the flow exceeds 120% of capacity. Construction Phase I sewer lines include Priority I sewer lines, existing lines that are undersized for current dry weather flows. Priority I lines are currently flowing greater than 120% of maximum capacity. The Phase I priority I lines that will be certified are identified in Appendix 14.

## B. Operation and Maintenance Plan

The operation and maintenance (O&M) manual will be prepared by the design engineer upon the completion of the expansion of the wastewater treatment plant. Development of the manual is not possible at this time since the as-built equipment needs to be known. Nonetheless, this section discusses in some detail the elements that must be included in the manual. This manual will include data on each of the treatment process units and their operation and maintenance. Also included in this effort will be plant personnel training as required to ensure the system is operated properly and as designed. The operation and maintenance plan for the City of Brawley Wastewater Treatment Plant will be similar to that already employed by the plant personnel.

Operation and maintenance manuals for each piece of equipment will continue to be maintained at the plant site. These manuals contain the specifications and cut sheet drawings for each system component. Additional information includes maintenance schedules for each item and a replacement parts list. The manuals will continue to contain a schedule for equipment checkups and routine maintenance that is followed by each operator

**Start-up Operation Plan**

Traditionally, the contractor and the equipment supplier jointly conduct the initial start-up of plant equipment. This helps to ensure that the equipment is installed correctly and that the equipment is not started improperly, thus voiding the product warranty. This procedure helps protect the City from claims by the manufacturer that the equipment was not installed or started up properly.

The design engineer will submit for review, detailed information (shop drawings) on each piece of equipment chosen for this project. The review will determine if the equipment meets the requirements of the specifications. Equipment that does not meet the specifications will be rejected and the contractor will be required to submit a suitable replacement unit.

Although some defects in the equipment may not be detected during the shop drawing review phase of the construction project, the start-up phase will typically identify such deficiencies. If the equipment fails to operate properly either at start-up or during the warranty period, the manufacturer and the contractor will be responsible for removing and replacing the equipment with a satisfactory unit. This work is normally undertaken at no additional cost to the City. If the warranty period for a particular piece of equipment has expired, it is normally the responsibility of the City to arrange for its repair and/or replacement, including the costs associated with removing the unit from service.

The construction of the new plant and the installation of equipment is to be accomplished while the existing plant remains in operation. Prior to the initiation of the construction activities, the contractor will submit a sequencing plan to the District for its approval. This plan will account for the continued operation of the current treatment facility and will address the environmental concerns of the construction.

**Contingency Plan**

The contractor will be required to submit an emergency response and contingency plan upon the issuance of contract award notice. This plan will detail actions to be taken should an emergency arise during the construction or start-up of the plant. This plan will include emergency numbers, contact personnel, and evacuation procedures.

This information will be updated and maintained by City after construction and start-up is completed so that should an emergency occur during normal operation, a response plan is in place and can be implemented quickly. The plant operations personnel will be trained in emergency response procedures.

**Safety Plan**

An operational safety program will be developed and implemented for use by City plant personnel involved with plant operation or maintenance. This plan will be reviewed periodically for relevance and updated as required for currency. Necessary safety equipment will be obtained and maintained at the plant site for use by the operators.

**Quality Assurance Plan**

The primary course to ensure that the quality of the project's output meets the predetermined standards is to review the engineering design. This review will focus on the type of treatment system proposed and the determination that the design is based on generally accepted engineering criteria. The responsibility for this determination lies with the project's design engineer.

### C. Compliance with Applicable Design Regulations and Standards

The following requirements are being met.

Environmental Assessment - Included in Appendix 11.

NPDES Discharge Permit - Will be submitted for approval by March 2000. Copies of the existing and proposed interim permits are included in Appendix 12

The designs will be reviewed by the California State Regional Water Quality Control Board (SWRCB) at the 30%, 60% and 90% stage submittals. The local regional office address is:

Executive Director

California Regional Water Quality Control Board

Colorado River Basin Region

73-720 Fred Waring Drive, Suite 100

Palm Desert, CA 92260

### *A.* Financial Feasibility

This section provides the financial considerations of the proposed Water and Wastewater projects presented in the Water and Wastewater Master Plans. For the sake of clarity, The Financial Feasibility and Fee /Rate Model are in separate subsections for the Water Enterprise Fund and the Wastewater Enterprise Fund

**Financial Statements - Historical**

Audited financial statements for the years ended June 30, 1991 through 1998 are provided in Appendix 5.

**Financial Statements - Pro Forma**

Pro forma financial statements are included in the subsequent sections for the Water Enterprise Fund and the Wastewater Enterprise Fund.

**Financial Structure**

The NADB has performed a financial evaluation to determine the financial feasibility of the project. The evaluation determine the impact on user fees resulting from the implementation of the project under different grant/loan arrangements. The NADB recommended the amount of BEIF the city could receive to make the project feasible. The findings of the analysis were presented to the community during the second public participation meeting, which took place on August 5, 1999.

The following table summarizes the estimated construction cost of the proposed projects.

| Estimated Capital Cost | |
|---|---|
| ITEM | USD |
| **Wastewater Treatment Plant Expansion** | **$6,500,000** |
| **Disinfection Facilities** | **$673,000** |
| **Improvements to the Wastewater System** | **$772,736** |
| **Improvements to the Water System** | **$5,615,902** |
| TOTAL | $13,561,638 |

In addition to pursuing BEIF funds, the City has applied for funding from the Economic Development Agency (EDA) for a total amount of $1,500,000. Furthermore, USDA has committed funds to finance part of the improvements necessary to serve the needs of Po Colonia and La Colonia. It is important to point out that the actual mains from the city limits to the two colonias will be paid for by USDA and are not included in this cost estimate.

The following table summarizes the financial structure recommended by NADB.

**Project Financial Structure**

| Available Funding | Amount (US$) | % of Total |
|---|---|---|
| ***Capital*** | | |
| City Contribution | 5,593,902 | 41.25 |
| *Subtotal Capital* | *5,593,902* | *41.25* |
| ***Grants*** | | |
| USDA/RD | 277,000 | 2.04 |
| EDA | 1,500,000 | 11.06 |
| BEIF | 6,190,736 | 45.65 |
| *Subtotal Grants* | *7,967,736* | *58.75* |
| TOTAL | 13,561,683 | 100.00 |

In addition to BEIF construction assistance , NADB analyzed the possibility of providing BEIF transition assistance to allow for a more gradual increase in rates. Nonetheless, no transition funds were recommended as the required rate increase will not be unaffordable to the community.

**Water Enterprise Fund**

**Capital Improvements**

The improvements are divided into four 5-year phases, which allows for the construction of the distribution infrastructure at a fairly steady pace without severely taxing the City's revenues at any one time. Certificates of Participation have been issued to cover the cost of the new water treatment facility. Of the four distribution phases, **Phase 1 is the phase to be certified in this document.** According to Pountney & Associates, Pipeline replacements costing as estimated $5.17 million in Phase 1 are for halth related reasons. The Phases 2, 3, and 4 improvements be constructed over the remaining 15 years at roughly $1 million a year, except for years 2005 and 2006, which will be $500,000 and $600,000, respectively.

The existing water treatment plant will need to be expanded when the average demand exceeds 15 mgd. The WMP recommends the next plant expansion to 30 mgd capacity at an estimated cost of $17.2 million.

To meet future water demand requirements, the distribution system and storage system should be upgraded to meet the needs of development to the buildout population of 42,101. The projected cost for the distribution system and storage is $29.1 million. Total Future system cost is $46.3 million. Table 5-2 is a schedule of construction until year 2020, under a low growth case. BECC certification is being sought only the Phase 1 facilities for the existing system. See "population" in section 5.4.

**Water Service Charges**

Water rates for the Water Enterprise Fund have been established by an ordinance of the City Council of the City of Brawley.

The City Ordinances passed by the Brawley City Council established the water and wastewater rates over the past five years are included in Appendix 4.

**Service Fee Collection**

The City of Brawley requires a two month deposit to start water and wastewater service. Because the City is collecting two months in advance, the staff has ample time to collect any monthly charges or shut off the service. Consequently, uncollectable accounts are less than $1,000 in any one year.

**Financial Feasibility**

The financial feasibility of a successful twenty year period ending in the year 2020 for the Water Enterprise Fund is dependent upon certain assumptions:

- Maintaining the current water service charge rates (in constant dollars);
- The growth of the City's population should maintain at least the "low growth" level to provide adequate service charge revenues;
- The success in obtaining grant funding to improve the health related conditions through capital improvement.
- The ability to obtain adequate outside funding for future expansion to the water system;
- Final construction estimates are not exceeded materially.

**Population Growth**

The WMP was developed based on an assumption that within the next twenty years the population of the City will grow from 21,023 to 42,101. This assumption was needed to show the capital improvement necessary in the twenty year period to place Brawley at a buildout ready capital level. The annual growth rate in the buildout growth case averages 3.2% annual growth. This level of growth Berryman & Henigar will call "buildout growth" for the purposes of this report. In an effort to show a more conservative service charge revenue in determining financial feasibility, Berryman & Henigar have incorporated a "low growth" case which assumes a gradual 1.0 percent annual increase in population in the early years to a 2.0 percent annual increase in the later years, a growth from 21,023 to 28,397.

**Operations and Maintenance Expenses (O&M)**

The cost to operate and maintain the existing system is recorded in the audited financial statements in Appendix 5. The costs are detailed as (1) salaries and benefits, (2) supplies and services and (3) administration. The O&M for the existing system was determined to be $1,717,618, 4% above year 1998 total cost and within $1,000 of the annual budget. The O&M cost for the future was estimated at a cost per estimated gallon of flow per year based on the current cost per gallon for treatment and distribution. Operations staff has indicated that the O&M costs at the new water treatment plant will be equal to or less than the old plant because improved operating efficiency. Consequently, the O&M cost will be projected at the same cost per gallon treated and distributed in the current operations. The calculations of the O&M cost are based on flow.

**Water Demand Forecast**

The average water volume forecast is based on the low population growth used in this analysis to the year 2007 by user category. A forecast of the total average water demand each year to the year 2020 is in the Flow and O&M summary Table 5-4a schedule above.

**Existing Financing**

The City of Brawley entered into financing arrangements as follows:

Water District Bonds Payable

On June 1, 1977 the Brawley County Water District issued Bonds totalling $368,200. Subsequently, the Brawley County Water District was annexed by the City at which time these outstanding bonds became an obligation of the City. All funds to pay the outstanding bonds are collected by the County of Imperial. The bonds bear interest at the rate of 5% with a final maturity date of June 1, 2017. The balance as of June 30, 1998 is $261,700. Debt service requirements to maturity on the Water District bonds, including interest of $149,390, are as follows:

Contracts Payable

On August 25, 1995, the California Department of Water Resources (DOWR) agreed to loan the City $5,000,000 toward the cost of a new water treatment plant. The terms of the contract provide a 30 year repayment period at an interest rate of 3.0315 percent. As of June 30, 1998, the City had been advanced $3,996,480 under the contract. Debt service requirements will be set when all advances have been made.

Certificates of Participation

On May 5, 1998, the City of Brawley Public Improvement Corporation sold Certificates of Participation in the amount of $17,450,000 with an average interest rate of 4.77% to advance refund $17,755,000 of outstanding 1996 Certificates of Participation with an average interest rate of 6.27%. The net proceeds of $16,566,301, along with $2,738,700 of prior construction proceeds and $187,259 reserve requirements, were used to purchase U.S. government securities. These securities were deposited in an irrevocable trust with an escrow agent to provide for all future debt service payments on the 1996 Certificates. As a result, the 1996 Certificates are considered to be defeased and the liability for those certificates has been removed from the Water Enterprise Fund.

The advance refunding resulted in a difference between the reacquisition price and the net carrying amount of the old debt of $2,154,125. This difference, in addition to $509,624 in unamortized discount from the 1996 issue, is being charged to operations through the year 2024 using the straight-line method. The City completed the advance refunding to reduce its total debt service payments over the next 26 years by $4,371,751 despite incurring an economic loss (difference between the present values of the old and new debt service payments) of $84,384. The City also benefited by lower coverage requirements (ratio of net revenues to debt service expense) on the new issue.

The Certificates are payable solely from lease payments pursuant to a lease agreement between the City and the Public Improvement Corporation. The City is required under the lease agreement to make lease payments as rental for use and possession of the water treatment plant which are equal to the debt service requirements of the Certificates. The balance payable as of June 30, 1998, net of unamortized discount of $2,647,047, is $14,802,953. Debt service requirements to maturity on the Certificates of Participation, including interest of $13,572,444, are as follows:

**Reserve Requirements**

In accordance with the covenants of the Certificates of Participation dated May 1998, the City is required to maintain certain reserves. These reserves include an operating reserve fund, a renewal and replacement fund for major capital non-recurring repairs or replacement required from occurrence of uncontrollable circumstances and a system improvement fund for capital improvements to the system. At June 30, 1998 the City had a reserve balance of $487,000 from retained earnings and $1,154,250 is for certificate of participation reserves.

**Financial Projection Low Growth Case**

The low growth rate case forecasts that population will grow an average of 1.4 percent, with existing annual debt service of $1.4 million and the existing water service charge rates (at constant dollars) will remain in place for the twenty year planning period. Under these conditions the debt service coverage ratio, reserve requirements and ending cash flow balances will be adequate over the twenty year planning period.

Revenue, Expenditures & Net Revenue Statement (Appendix 9) displays the calculation of the debt service coverage ratio. The revenue increase is due to the steady, moderate increase in population without a rate change in a non inflationary economy. The debt service coverage ratio shows a steady increase from 1.43 in 1999 to 1.72 in 2020. The earnings remaining after payment of the debt service are applied against the replacement of existing aging capital. These earnings average higher than $500,000 per year for the twenty years.

The annual cash flow projections as displayed in Appendix 9, Revenue and Expenditures Statement including grant funds and capital expenditures carry adequate cash balance at year-end throughout the twenty year period. Assumptions for this table include that the expansion related capital cost is paid by the new users via the Development Impact Fees or other outside source. All revenues and other cash inflow is included and all O&M expenditures, capital cost and debt service are identified in the cash outflows.

The Sources and Uses for Capital Improvements of the Water System are displayed in either existing system or expansion of the system in Appendix 9. In the existing system, the source for funding is the annual replacement reserve generated by the annual operations each year. The capital use is the four phase capital improvement program in the Water Master Plan. The primary source of funding for the expansion of the system is the developer. The uses are the new distribution system. In the low growth case, the treatment plant expansion with occur beyond year 2020.

**Breakeven Analysis**

The operating breakeven includes the O&M cost and the expected depreciation over the twenty year period. The depreciation includes straight-line depreciation with a fifty year life and 10 percent salvage value and it is a recognition of the need for a replacement reserve. The breakeven is approximately 60% of revenue in the early years to 70% of the generated revenue in the latter years, as shown in the Figure below.

**Wastewater Enterprise Fund**

**Capital Improvements**

The wastewater treatment plant (WWTP) recommended capital improvements are in the following phases:

The current WWTP capacity is 3.9 mgd. Phases 1 and 1A will increase the capacity to a needed 5.9 mgd and add disinfection process. This will prevent the occurrence of raw sewage discharge and improve the quality of treated effluent into the New River.

The phases 1 through 3 will expand the capacity to 12 mgd which is the ultimate capacity for the estimated buildout population of 42,101 for the City. The Phase 1 and 1A are the certified phases. All the estimated capital costs to the WWTP are on the existing site as improvements to or expansion of the existing WWTP.

The recommended capital cost to the collection system were segregated into two categories: (1) rehabilitation cost and (2) new construction.

See Table 5-8 for the collection system phasing cost and scheduled start dates:

The phase 1 rehabilitation cost of $772,736 is to replace infrastructure with severe deficiencies according to Weston. This phase is part of the Step II Certification. Requested funding for Phase 1 collection system from the Border Environmental Infrastructure Fund is $273,000. The projected twenty-year implementation schedules are displayed in Appendix 3.

**Wastewater Service Charges**

The monthly residential service charges increased from $8.61 prior to September 1994 to $12.40 in January 1996. Table 5-9 has the detail of the historic wastewater service charges.

The City Ordinances passed by the Brawley City Council establishing the water and wastewater rates over the past five year are included in Appendix 4.

**Pro Forma Rate**

The pro forma wastewater service charges rate structure, a modified flat rate, has been developed based upon the premise that the rate structure must provide the revenue required by the City for operation and maintenance of the wastewater system and cover debt requirements. In addition, the recommended rate structure must be equitable to the City's wastewater system customers.

Since the City of Brawley's water system is 98% unmetered, monitoring of flow is not a consideration in determining Brawley's rate charge system. The recommended rate charge schedule is established based on other districts and municipalities' user charge systems. The service charge standard loadings, that is, flow, chemical oxygen demand and suspended solids have been in development since the 1980s, refined over the years and accepted by the State Water Resources Control Board (SWRCB). The Los Angeles Sanitation District 1 and the City of San Diego user charge systems were examined in detail during the development of the City of Brawley's recommended rate schedule. In addition, other cities in Imperial County, other Southern California and Central Valley cities were reviewed for comparison purposes. Our recommendation is to establish this new rate charge structure as a precursor to the flow metered rate charge system. In summary, the recommended rate charge system will contain the following elements:

1. Residential customers rates will contain two tiers: (a) single family home and (b) reduced single family home and multi-family / mobilehomes. The (b) customer charges are charged the greater of the current rate ($12.40 / Month) or 75% of the (a) customer charge (SFD).
2. Commercial customer categories are reduced by a net seven categories with churches, public administration as new categories.
3. Some commercial users, such as bakeries, car washes, laundries, and restaurants, with high strength and/or high flow effluent will be charged a significant increase.
4. Hotels, rooming houses & motels will be charged based on the number of rooms.
5. Grocery stores, public administration, service shops, warehouses, churches and other commercials will be charged based on frontage.
6. Pioneer Hospital and convalescent hospitals will be charged based on a per bed basis.
7. School charges will be based on the number of students on the rolls.

Table 6-4 shows the recommended wastewater service charges (charges) to be used in a "low growth rate case" to be analyzed below in the financial feasibility analysis. The charges will change based on the City population and operations and maintenance expenditures however the rate structure will remain the same.

A fee rate model was also prepared by the NADB as part of the financial analysis. This model was utilized to determine the impact on user fees of the proposed project under several combinations of grants (both construction and transition) and loans.

The current water rate is $39.25 per month, while the sewer rate is $12.40 per month. The NADB analysis concluded that the current combined water and sewer rate of $51.65 is relatively high given the economical conditions of the City of Brawley. Thus any significant increase in the combined rate will render the project financially unfeasible. The City has increased water rates from $16.00 a month in 1994 to $39.25 in 1999, or a 145% increase in five years. This increase has been the result of debt incurred by the City for $24 million to finance the construction of the water treatment plant. The only increase in rates recommended at this time will be from $12.40 to $13.00 per month for sewer rates, a 4.8% increase.

**Service Fee Collection**

The City of Brawley requires a two month deposit to start water and wastewater service. Consequently, uncollectable accounts are less than $1,000 in any one year.

**Financial Feasibility**

The financial feasibility of the Wastewater Enterprise Fund's success during the impeding capital improvement program is depend upon the following:

- The success of the grant funding program to fund replacement cost, environment related costs and expansion needed to ensure economic growth.

- The success of obtaining low interest rate financing at long-term paybacks.
- The growth of the City's population over the next 20 years to provide revenues from the wastewater service charges (minimum "low growth" level).
- The success in establishing wastewater service charge rates to obtain maximum service revenue that is affordable to the users.
- The success in obtaining expansion dollars from future developers.
- Final construction estimates are not materially exceeded

**Grant Funding**

Anticipated funding for the Phase 1 of the WWTP consists of $3 million grant from the Border Environmental Infrastructure Fund of the North American Development Bank and a $1.5 million grant from U. S. EDA (see Table 5-11) . Grant funding at the beginning of the capital improvement effort has a significant effect on the level of service charge increase. For example, an additional $2.5 million grant for the phase 1 capital improvement results in a $5.00 less SFD charge by the year 2006.

**Table 5-11**

**Population Growth**

The WW Master Plans were developed based on an assumption that within the next twenty years the population of the City will grow from 21,023 to 35,164. This assumption was needed to show the capital improvement necessary in the twenty year period to place Brawley at a buildout ready capital level. This level of growth Berryman & Henigar will call "high growth" for the purposes of this report. The annual growth rate in the high growth case starts at 1.5 percent and continues at 3.6 percent for the last ten years. In an effort to show a more conservative service charge revenue in determining financial feasibility, Berryman & Henigar have incorporated a "low growth" case which assumes a gradual 1.0 percent annual increase in population in the early years to a 2.0 percent annual increase in the later years, a growth from 21,023 to 28,397.

**Operations and Maintenance Expenses**

The cost to operate and maintain the existing system is recorded in the audited financial statements in Appendix 5. The costs are detailed as (1) salaries and benefits, (2) supplies and services and (3) administration. The O&M for the existing system was determined to be $623,467, 2% above year 1998 total cost and a mid-year estimate of this year's cost. The O&M cost for the future capital enhanced WWTP was estimated at a cost per estimated gallon of flow per year based on the current cost per gallon for treatment. Since the treatment process is not changed significantly, the cost per gallon of O&M should not differ materially, with the exception of the Ultraviolet Disinfection (UV). The additional O&M cost for UV was estimated by Weston in the WW Master Plans at $28,900 per year. This cost was added in year 2003. Collection system O&M was separated by Weston as a $1 per linear foot of pipeline and this was included the O&M calculation. See Appendix 8 for Projected O&M calculations. Depreciation of fixed assets is not included in the O&M cost. However a "set aside" for replacement capital cost is recognized each year and it is assumed that this will be continued after year 2020. See Table 5-13 for a summary of projected O&M cost.

**The Rate Case**

Rate cases were used to examined the effect other revenues, capital construction cost estimates and related O&M have on the service charges (rates). During the financial analysis one case was determined as the most likely case to occur given the present circumstances. The case is the **low growth with grant funding case (Case 2)** and will be compared to other considered cases to demonstrate the effect of the critical variables of population growth, available grant funding and financing on the financial outcome. The assumptions in the cases are:

1. Low growth population;
2. $2.5 million and $6.7 million in grant funding of phase 1 capital cost in case 1 and case 2 respectively.
3. Financing of remaining phase 1 capital cost, $3 million at 6% interest for 20 years (case 1 only);
4. All expansion related capital expenditures will be paid by (a) new users via development impact fees, other financing methods or (b) other funding;
5. A replacement reserve will be maintained to provide annual pay-as-you-go ability.
6. The WWTP expansion is delayed for phase 2 by one year and phase 3 by as much as four years because of an assumed delayed demand (low growth).

In Case 1 revenue generation is derived from $4.5 million in grant funding in year 2000, financing $3.0 million of the projects by year 2001 and four service charge rate changes from year 2000 to the year 2006. The service charge rate increases from $12.40 to $18.80, a 50 percent increase over eight years. The financial statements for this case are displayed in Appendix 10. Revenue, Expenditures & Net Revenue Statement shows a minimum 1.31 annual debt service coverage ratio and an annual replacement reserve minimum of $153,000 in one year (year 2008). The Revenue and Expenditures Statement Including Grant Funds and Capital Expenditures shows a year end annual positive cash balance minimum of $728,000 in year 2014. This statement displays cash flow from operations, financing activities and capital outlays. Sources and Uses for Capital Improvements of the Wastewater System has two separate accountings for (1) existing system capital costs and (2) expansion of capital costs. The existing system cumulative balance drops to a low of $190,000 in one year (year 2015). The expansion of capital cost is paid out of new user's fees or financing. This could also be assumed to be funded from some other economic source. However, service charges are not considered as a revenue source for expansion capital.

In **Case 2**, assumes all grant funding in place of the financing which results in the service charge rate for SFD increases from $12.40 to $15.00 after eleven years, a 21 percent increase or a 2 percent average annual increase. The debt service coverage ratio remains above 1.50 as displayed in Appendix 10 and the annual year end cash balances remain above $500,000 each year. Existing system capital outlay source, also shown in Appendix 10, Sources and Uses For Capital Improvements, also remains strong above $300,000.

Case 3 provides us a look at the effect community population growth has on the Wastewater Enterprise Fund during the next twenty years. In this case $4.5 million in grant funding and $3.0 million in financing are again assumed. The effect on service charge rates is an increase by year 2006 for SFD to $17.80 or $1.00 less than in Case 1. The indicators of financial strength and stability such as the debt service coverage ratio remain at the 1.30 to 1.40 level for about twelve years and the cash balance drops to $146,000 and remain low for the period 2011 to 2014. Even though more income is generated in Case 3, the high growth case, it is not as significant an increase to warrant a material change in the service charge rate in comparison with Case 1. See Table 5-14.

Given the present conditions, Case 2, low growth with $6.7 million grants is the best financial projection and provides a positive effect on the service charge rate level because the twenty years annual debt service for $3 million in case 1 is not required. This will lessen the financial burden on the rate payers for the health related improvements to the wastewater system

**Breakeven for Case 2**

The operating breakeven for Case 2 includes the O&M cost and the expected depreciation over the twenty year period. The depreciation includes straight-line depreciation with a sixty year life is a recognition of the need for a replacement reserve. The breakeven remains between 73% to 83% of the generated revenue until phase 2 expansion of the treatment plant is completed. After the Phase 2 expansion is completed, the revenue level necessary to just cover costs is at 90% to 99% of revenue and remains at this level through year 2020. See Figure 5-1 below.

Figure 5-1

**Projected Financing**

New financing is projected in year 2001. The terms are 6 percent financing of $3 million for a 20 year term. The financing costs and debt service amounts are detailed below.

**Demographic and Economic Information of the Proposed Service Area**

The water and wastewater systems serve an estimated population of 21,000. Continued moderate growth of Brawley's population at approximately 1.7% per year is anticipated for the foreseeable future. Commercial, industrial, and residential development anticipated by the City's 1995 General Plan and 1997 Housing Element predict a 20 year buildout population of between 35,404 and 42,100.

Source: City of Brawley 1995 General Plan, Land Use Element

Notwithstanding the recent upturn in the overall national economy and low unemployment, the City of Brawley continues to experience over 24% unemployment. Based upon projected development within the area it is not anticipated that a sufficient number of new jobs will be created to significantly decrease chronic levels of high unemployment. With a large segment of Brawley's population in the very low and low household income levels and with approximately 25% unemployment the fee rate setters need to be sensitive to rate pricing the low users of the utilities when the rates are established.

Growth in Brawley is not only measured by population and household income but also property assessed value. The assessed and estimated values of taxable properties in the City of Brawley for the last ten years have increased over 87 percent from $242 million dollars to $454 million dollars.

The City of Brawley's annual revenue has increase consistently for the past ten years from $5.9 million to $9.3 million. The City's Fund Equity has more than doubled from 1992 to 1998 from $12 million to $27 million dollars.

Retail sales dropped during the 1980s but have shown an increase in the early 1990s according to the City's General Plan dated January 1995. Brawley's strongest retail market is in building materials and farm implements.

The City of Brawley Economic Development Goals and Policies are detailed in the Economic Development Element of the City's General Plan and address its long-range economic growth in the following issues:

- *Fiscal strength and stability.* Included in this issue is "implementing an infrastructure improvement program to enable the City to offer fully served industrial and commercial sites tied to multi-modal transportation".
- *Business promotion. "*Included in this issue is promote economic opportunities associated with regional and international markets to stimulate business for the City …such as NAFTA business opportunities".
- *Promotion of downtown business district.* "Promote recreational and retail opportunities."

*Balanced employment and housing.* "Achieve a balance between housing and employment opportunities." The proposed 740 acre project area (including Luckey Ranch) within Brawley's sphere of influence prezoned for residential, commercial and industrial is an example of addressing this issue

**Project Management**

**Organizational Structure**

The organization chart of the City's lines of authority for the administration and operation of the water and wastewater enterprise funds and facilities is displayed on the following page. The job descriptions and resumes of the key management and functional department heads are in Appendix 2 of this report.

The City of Brawley is a general law city organized under the Constitution and laws of the State of California. Dennis H. Morita of Horton, Knox, Carter & Foote Attorneys At Law, who represents the City as the City Attorney, addressed the following issues in a letter dated February 5, 1999 in Appendix 1:

- Legal framework of the City and status of current operations;
- The City's ability to undertake a long-term obligation and to pledge specified net revenues;
- Legal issues that could impede the project's progress.

A. **Comprehensive Community Participation Plan**

The objectives of the Comprehensive Public Participation Plan (Plan) are to ensure that the community understands and supports the environmental, health, social, and financial benefits and costs of the project, as well as any changes in user fees. A public participation plan was submitted by the City of Brawley on April 7, 1999 based on BECC's Public Participation Guidelines. The Plan included the development of a steering committee, meeting with local groups and organizations, carry out a project information campaign, hold several public meetings throughout the community, and prepare a final report documenting public support and understanding of the project. The activities carried out in fulfillment of this Plan are detailed below.

**Steering Committee**

The steering committee was formed in early April 1999. Its members include Gordon Jongeward, Real Estate Manager and Chairman; Joseph Clark, a local Veterinarian; Jerry Gauna of the Imperial Irrigation District; Mercedes Wheeler, Attorney at Law; and, Danny Paramo of the Department of Corrections. The committee contributed and approved the Plan, participated in the development of the public outreach and information campaign and presented the project at the local organization meetings. Committee members attended City Council meetings as well. The committee met in seven occasions: April 14 and 21, May 12, 17 and 24, June 3 and August 4 to follow-up on the public process.

**Technical Work Group**

The steering committee had the assistance of a Technical Work Group (TWG) composed of the Public Works Director, Manuel Aceves, City Planner, Jesse Soriano, Consultant Engineers of Weston, Inc., and Dilda Mcffaden, Facilitator, to assist in organizing the activities of the committee. The TWG assisted by making the arrangements for all the public presentations, participating in the presentations, taking minutes, explaining technical aspects of the project, assisting in the development and printing of the brochures, preparing the public service announcement and publishing the public notices.

**Local Organizations**

The project sponsor and steering committee presented the project to the leadership and membership of 14 local organizations to solicit their support. These organizations include the Brawley Union High School Board of Trustees, Soroptomist Club, Campesinos Unidos, Brawley Economic Development Council, Optomist Club, American Citizens Club, Rotary Club, Kiwanis Club, Imperial Valley Press, Chamber of Commerce, Brawley Planning Commission and Clínicas de Salud del Pueblo. The steering committee Chairman and the TWG presented the project and fielded questions presented by the public. Presentations were made in English and Spanish. Letters of support and resolutions were provided by Campesinos Unidos, American Citizens Club, Brawley Elementary School, Brawley Union High School, Chamber of Commerce, Rotary Club, Brawley Economic Development Commission and Brawley Planning Commission.

**Public Information**

Information in Spanish and English about the project was provided by mail to the 4,800 Brawley households involved in the project. Information about the financial aspects of the project was presented to the public during the second public meeting. Press coverage included articles in the Imperial Valley Press and Imperial Valley Weekly. The Imperial Valley Press reaches more than 2,700 Brawley households and 350 newsstands, and county-wide reaches more than 13,600 households and more than 2000 newsstands. Public service announcements about the project were aired in KUBO, KXO and KWEST, local radio stations. Project information was also available to the public at the office of the City Clerk, City Finance Department, Public Works Department and office of the City Manager. The availability of this information was noted in the public meeting notices posted in the Imperial Valley Press and in the mailed information by identifying the locations where the public could review and comment on the project.

**Public Meetings**

Two public meetings were held in addition to the 14 meetings held with the leadership and membership of local organizations throughout the city. More than 170 people attended these organizational and the public meetings. The first public meeting took place on 14 April, with proper 30 day notice posted in the Imperial Valley Press, and the second public meeting was held on 4 August.

The items discussed at the public meetings and presentations included a summary of the issues related to the sewer plant's non-compliance with California Regional Water Quality Control Board permit, the physical condition of the plant, past improvements, needed improvements, estimated costs to do the improvements, projected increases in sewer and water rates based on three scenarios and a period for questions and answers.

The financial analysis was presented by a financial sub-consultant and principle author of the City of Brawley Wastewater Rate Study. The analysis was approved by the NADB and presented three (3) estimated wastewater services charge rate changes which are presented below:

1. High growth rate with $4.5 million in grants. This scenario contemplates an immediate increase of approximately $3.80 per month and steady increase from present value of $12.40 to $18.80 in the year 2006.

2. Low growth rate with $4.5 million in grants. The second scenario contemplates an immediate increase of $2.40 per month and steady increase from present value $12.40 per month to $17.80 per month in year 2006.

3. Low growth rate with $8.1 million in grants. This scenario contemplates an increase of $0.60 the first year to $13.80 in year 2006.

The likely scenario is estimated currently at an immediate increase to $0.60 per month beginning January 2000. The rate increase shall be presented to City Council in late 1999. This increase can only be done through an ordinance and thereby require a formal public hearing. Upon adoption the Council requires two (2) readings to provide the public additional meetings to make comments before the new rate is implemented. The public hearing and readings are published in the largest newspaper in circulation in the city/county.

Due to the number of public meetings and public presentations (16), access to project information and published notices, mailed literature, newspaper articles and radio public service announcements, the users of sewer and water services of the City of Brawley were provided the opportunity to participate in the public process and fully understand the technical, financial, health, social and environmental aspects of the project. During the public and organizational meetings as well as with individuals contacted about the project, public support was evident. Given that there is no record from the City Manager's office, City Clerk, Public Works Department or Planning Department that any person or organization objected about or was opposed to the project, and that local organizations provided support letters and resolutions, the steering committee and City of Brawley determine that the citizens of the city support the project's cost, benefits, risks, impacts and possible changes in user fee rates.

## *A.* Definition and Principles

Projects must follow the definition and principles of sustainable development, which states. *Conservation oriented social and economic development that emphasizes the protection and sustainable use of resources, while addressing both current and future needs, and present and future impacts of human actions* as defined in the Border XXI environmental program developed by U.S. and Mexican authorities.

Principle 1 of the Sustainable Development Certification criteria states "Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature". The long term needs of the community in and around Brawley have been comprehensively identified through the development of the Water and Wastewater Master Plan and Project Financial Analysis (Master Plan) based on the long term population and economic projections for the Brawley sphere-of-influence, as defined by regional planning authorities. The Master Plan will improve the quality of life in the community by assuring a healthy and abundant potable water supply meeting community needs and providing safe collection and treatment of wastewater. In doing so, enhanced opportunities for creating new employment opportunities will help to alleviate the historically high levels of unemployment afflicting Brawley and thus enhance the quality of life.

Growth projected by regional planning authorities anticipates increased economic activities in California near the International Border. The Master Plan will ensure that a stable and safe water delivery system and wastewater treatment system will be available for current and future Brawley residents and provide a foundation for commercial and industrial development and complies with Principle 2 of the Certification Criteria. Project planning and size is based on the build-out needs of Brawley. The Master Plan will not only meet the needs of the current population, but will address anticipated growth through the year 2020. It is important to note, the Master Plan is not designed to cause increased growth, but to serve projected growth resulting from increasing population and employment opportunities

Adequate potable water delivery and wastewater treatment meeting federal and state regulatory environmental, health and safety standards will be achieved through the construction of improved facilities proposed as part of the Master Plan process. Environmental protection is an integral part of the approval process for these certified projects.

The flow projections developed in the Wastewater Master Plan indicate an ultimate flow of 12 MGD. The WWTP capacity must be increased from 3.9 MGD to 12.0 MGD over a 20 years period. This expansion will be constructed in phases, rather than at a single time, to be cost effective by coinciding increased plant capacity with the growth of the city. The phasing alternative considered most favorable was the three phases alternative.

Four treatment process alternatives were evaluated for the WWTP Master Plan. These were: No action, Aerated lagoon, Combination aerated lagoon and activated sludge, and Aerated lagoon with reclaimed water. The alternatives were evaluated through the matrix shown in Table 7-1 below.

Table 7-1

Process Alternatives Evaluation Matrix

| Item | Criteria | Process And Scoring | | | |
|---|---|---|---|---|---|
| | | Weighting Factor | Aerated Lagoon | Lagoon/ Act Sludge | Lagoon/ Rec. Water |
| 1. | Reliability of system and components | 2 | 8 | 6 | 6 |
| 2. | Flexibility to operate under changes in flow or upset conditions | 2 | 8 | 6 | 4 |
| 3. | Complexity in maintaining/controlling process | 2 | 8 | 6 | 6 |
| 4. | Area requirements | 1 | 3 | 3 | 1 |
| 5. | Safety to operators | 2 | 8 | 6 | 6 |
| 6. | Constructability | 1 | 4 | 3 | 2 |
| 7. | Staffing requirements | 1 | 4 | 3 | 3 |
| 8. | Power requirements | 1 | 5 | 3 | 2 |
| 9. | Capital Costs | 2 | 10 | 6 | 2 |
| 10. | 0 & M costs | 2 | 8 | 4 | 2 |
| 11. | Environmental impact potential | 2 | 8 | 8 | 2 |
| TOTAL SCORE | | | 74 | 54 | 36 |

NOTE: Scoring based on a scale from I to 5 with 5 being "most favorable" and 1 being "least favorable." Score is multiplied by the weighting factor.

According to the evaluation described above, the Aerated lagoon process was selected as the most favorable alternative.

Additionally, three disinfecting process alternatives were evaluated for the WWPT Master Plan. These alternatives were: Chlorination/Dechlorination (gas system), Sodium Hypochlorite /Sodium Bisulfite, and Ultraviolet. The evaluation matrix used is detailed in table 7-2 below.

Table 7-2

Disinfecting Alternatives Evaluation Matrix

| Consideration | Weighting Factor | Chlor./Dechlor. (Gas System) | Sod. Hyp. (Bleach)/ Sod. Bisult | Ultraviolet |
|---|---|---|---|---|
| 1. Effectiveness of Disinfecting System (ability to achieve target levels) | 1 | 5 | 5 | 5 |
| 2. Equipment Reliability | 2 | 10 | 10 | 8 |
| 3. Reliability at TSS=95 | 2 | 8 | 8 | 2 |
| 4. Flow Proportional | 1 | 4 | 4 | 4 |
| 5. Complexity of Technology | 1 | 4 | 4 | 4 |
| 6. Safety Concerns | 2 | 2 | 4 | 8 |
| 7. Sensitivity to Fluctuations in Effluent Stream (changes in BOD, TSS, chemical constituents, etc.) | 1 | 5 | 5 | 2 |
| 8. Adjustability to meet Fluctuations in Effluent Stream | 2 | 8 | 8 | 4 |
| 9. Chemical/Lamp Handling | 1 | 3 | 3 | 3 |
| 10. Similar Process Application (References) | 1 | 5 | 5 | 3 |
| 11. O&M Requirement | 2 | 6 | 6 | 6 |
| 12. Fish Toxicity | 1 | 4 | 4 | 5 |
| 13. Chemical Transportation to Site | 1 | 3 | 3 | 5 |
| 14. Corrosive | 1 | 2 | 3 | 5 |
| 15. Power Use | 2 | 8 | 8 | 6 |
| 16. Equipment Cost | 2 | 8 | 8 | 8 |
| 17. Installation/Structural Cost | 2 | 2 | 4 | 8 |
| 18. Annual O&M Costs | 3 | 6 | 3 | 12 |
| TOTAL SCORE | | 93 | 95 | 98 |

NOTE: Scoring based on a scale from 1 to 5 with 5 being "most favorable' and 1 being "least favorable." Score is multiplied by the weighting factor.

According to the evaluation described above, the Ultraviolet process was selected as the most favorable alternative. However, there is a concern with using this type of disinfecting technology due to the high TSS, 95 mg/L, in the WWTP effluent. Field test will be done in order to ensure the applicability of Ultraviolet disinfecting process.

As part of the Master Plan process, the City of Brawley is conducting a series of formal public meetings and workshops from April 14 through May 12, 1999 at local community group meetings throughout sectors of the community. Issues such as community needs, projected growth, proposed project and financial impacts, and other community concerns will be discussed at length during these meetings. The public comments will be made available during and after this public participation period. It is anticipated that the focus at the meetings will be on the residents' financial ability to support the rate increases for sewer services, any job opportunities connected with or as a result the infrastructure improvements and the timeline for the improvements. The stakeholders, that is the citizens and businesses of Brawley and Imperial County, will have an opportunity to understand the projects and become active in the planning process.

### B. Institutional and Human Capacity Building

The water and wastewater systems will be operated, maintained, and expanded as required by the Master Plan for the benefit of the community by the City of Brawley and accounted for through the Water and Wastewater Enterprise Funds. The City's existing staff is qualified and experienced in operating the current systems and in carrying out the capital improvement programs required to maintain and expand the systems.

Immediate increases in staffing are not anticipated, as current staffing resources are adequate for meeting expanded plant requirements. However, long-term human resource needs can be met through advancement of qualified existing personnel currently employed by the City and the hiring of specialists in public utility operations. Local training programs, including those provided at the Imperial Valley College, support the advancement of personnel. Institutional and human capital building within the City's public works department is

facilitated through in-house staff training programs, including seminars/workshops sponsored by the State Department of Health Services and the California/Nevada/Arizona American Water Works Association. The City actively encourages technical training programs with regional educational institutions, including Imperial Valley College located in nearby Imperial, California.

By establishing the sewer rate structure, recommended in the Project Financial Analysis, the City will charge for services in proportion the users' contribution to the total wastewater loading of the treatment. As existing system improvements are completed and dictate the necessity for sewer rate charge adjustments, a more equitable rate structure will be in place.

### C. Conformance with Applicable Local and Regional Conservation and Development Plans

The City of Brawley has made and will continue to make every effort to comply with all local, state, and federal guidelines and regulations concerning the treatment of potable water and wastewater. The City has the authority to provide water and wastewater services within the sphere-of-influence defined by the Local Area Formation Commission. The City Attorney has determined that the City of Brawley has the legal authority to enter into agreements for the use of public easements and rights-of-way, and the City will obtain permits to construct, operate, and maintain the water and wastewater systems, as required.

Long-term regional development plans for Brawley and Imperial County include commercial and industrial developments. Brawley Planning Department staff regularly confer with Imperial County staff to assure coordination of development. The City's General Plan, housing codes, and land use zoning will guide development in an orderly fashion that ensures the adequacy of infrastructure and community services as growth occurs.

The City maintains compliance with the State Water Resources Control Board on all water and wastewater regulations. The City's contact on regulatory requirements is :

Mr. N. J. Khilnani

State Water Resources Control Board

73720 Fred Waring Drive, Suite 100

Palm Desert, CA 92260

Phone: 760-346-7491

Fax 760-341-6820

### D. Natural Resource Conservation

There are planned technical improvements as described in the Water and Wastewater Master Plan that have a positive effect on the conservation of the surrounding natural resources.

**Water Distribution.** The existing aging cast iron pipes show extensive encrustation of the pipe interior causing low pressures and negative pressures. A continuation of this condition can cause failure to the pipeline and loss of treated water in the distribution system. A pipe replacement program will ensure a safe delivery of all potable water to the users and consequently, a reduction of water leakage..

**Wastewater Treatment Plant.** The expansion of the WWTP and the installation of the disinfecting process to the treatment of wastewater will improve the discharge to the New River, which flows northerly to the Salton Sea. The effluent flow to the Salton Sea from many communities upstream from the Salton Sea has been collectively polluted. The most favorable disinfecting process, Ultraviolet does not introduce chemicals into the process. This will provide an improved discharge from the Brawley Wastewater Treatment Plant into the New River.

**Wastewater Collection.** The improvements to the wastewater collection system will avoid the overflows that lead to pollution of water bodies.

**Metering New Customer.** All new users to the water and wastewater systems will be metered. This will provide a water usage record for encouraging water conservation.

**Water Conservation Plan.** Roy F. Weston, Inc. (WESTON®) was contracted by the BECC to develop a water conservation plan for the City of Brawley. In the report of this study, several alternatives for the water conservation plan are identified, including an evaluation of the alternatives with an assessment of the advantages and disadvantages for each. Additionally, an estimated cost for implementation and the approximate quantity of water conserved is presented for each alternative. A recommendation is included for the most appropriate alternative.

The goals of the water conservation plan include the following:

- Improve the utilization and prolong the life of existing and future facilities.
- Educate customers about the importance of conserving water resources.
- Protect and preserve environmental resources.

The following information was extracted from the Water Conservation Plan report. For further information see Appendix 18.

The City currently has 7,085 water connections and only 97 connections are metered. The average water consumption rate in gallons per day per person is approximately 259. The existing Average Annual Demand (AAD) is 7,493,392 gallons per day (gpd). The AAD projected water usage is shown in table 7-3 below.

Table 7-3

AAD Projected Water Use

| Year | Projected Population | Average Annual Demand (gpd) |
|---|---|---|
| 1999 | 21,000 | 7,493,392 |
| 2000 | 22,200 | 8,604,165 |
| 2010 | 31,600 | 12,949,745 |
| 2020 | 42,100 | 18,951,594 |
| 2030 | 50,038 | 24,518,000 |

The water conservation plan developed by WESTON includes five alternatives for the City's consideration. These alternatives are the following:

- Installation of water meters
- Irrigation ordinances
- Installation of water conservation devices
- Public education
- Xeriscape implementation

The estimated percentage of water savings for each alternative is shown in table 7-4.

Table 7-4

Water saving percentages of water conservation alternatives.

| Alternative | Water savings (%) |
|---|---|
| Installation of water meters | 20.56 |
| Irrigation ordinances | 1.63 |
| Installation of water conservation devices | 0.42 |
| Public education | 0.04 |
| Xeriscape implementation | 0.54 |

Considering a scenario of constant water saving percentage, the projected Average Demand of water for each alternative is detailed in table 7-5.

Table 7-5

Average Demand Projections considering each water conservation alternatives (gpd).

| Alternative | Year | | | | |
|---|---|---|---|---|---|
| | 1999 | 2000 | 2010 | 2020 | 2030 |
| No water conservation | 7,493,392 | 8,604,165 | 12,949,745 | 18,951,594 | 24,518,000 |
| **Installation of water meters** | **5,952,800** | **6,835,205** | **10,287,363** | **15,055,271** | **19,477,261** |
| Irrigation ordinances | 7,370,880 | 8,463,493 | 12,738,025 | 18,641,748 | 24,117,147 |
| Installation of water conservation devices | 7,461,900 | 8,568,005 | 12,895,322 | 18,871,947 | 24,414,960 |
| Public education | 7,490,762 | 8,601,145 | 12,945,200 | 18,944,942 | 24,509,394 |
| Xeriscape implementation | 7,452,928 | 8,557,703 | 12,879,817 | 18,849,256 | 24,385,604 |

The report of the water conservation plan includes the application of different combinations of alternatives. The projected amount of water saved by installing water meters and implementing and irrigation ordinance is 1,663,000 gallons per day. The consumption projection for this combination of alternatives is 5,830,000 gallons per day. The projected amount of water saved by installing water meters and implementing a public education program through the National Energy Foundation is 1,543,000 gpd. The consumption projection for this combination of alternatives is 5,950,000 gpd. The projected amount of water saved by installing water meters, implementing and irrigation ordinance, supplying and implementing a Xeriscape plan is 1,704,000. The consumption projection for this combination of alternatives is 5,790,000 gpd.

A comparison of the five alternatives that were evaluated is shown in table 7-6 below.

Table 7-6

Comparison of Evaluated Alternatives.

| Measure | Estimated Efficiency (gal/$) | Implementability | Potential Public Acceptance/Opposition[1] | Net Environmental Benefit |
|---|---|---|---|---|
| Water Meter Programs | 187.38 | High cost: materials and labor | High probability of public opposition | Conserve water |
| Irrigation Ordinances | 5,595.87 | Cost in advertising | Possible public opposition | Conserve water |
| Residential Water Conservation Devices | 94.41 | Cost of materials; use of economic incentives to encourage community participation | Possible public opposition | Conserve water |
| Public Education | 51.64 | Need materials and involvement with a distinguished program to possibly increase implementability | Low probability of public opposition | Conserve water |
| Xeriscape | 4,220 | Good for future residential, commercial, industrial, and public developments | Possible public opposition | Conserve water |

1The degree of social acceptability can be measured through the implementation of public involvement programs. In this type of program, community leaders and interested groups, as well as the general public, give opinions on water conservation through workshops, personal interviews, and surveys.

The water conservation plan described above will provide the community of Brawley with elements to select the most feasible and adequate alternative that will help the City using water more efficiently.

## Community Development

The City of Brawley currently suffers from high unemployment (between 25% to 30%) due in part to the seasonal nature of the agricultural economy that predominates throughout the Imperial Valley region. Development of non-agriculturally based commercial and industrial businesses will create additional and long-term socioeconomic development in the area. This development is fostered by the City's favorable location as a major transportation corridor between Mexico and the United States, and the expansion of commercial and light industrial business employment opportunities.

The improvement of the water and wastewater facilities is a vital part of the City's 1995 General Plan which addresses the need for "implementing an infrastructure improvement program to enable the City to offer fully served industrial and commercial sites tied to multi-modal transportation".

The long-range socioeconomic impact of the improved water and wastewater system is positive for the community since it provides job creation and infrastructure for industrial, commercial and residential growth.

The water and wastewater system improvement speaks to quality of life issues in Brawley for present as well as future generations by providing for the uninterrupted, even pressured, and purified domestic water and right sized conveyance of wastewater that is treated and disinfected before discharge into the adjacent New River.