



WATER CONSERVATION PLAN
FOR
LOWER NECHES VALLEY AUTHORITY

Prepared by:

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April 23, 1996

Mr. Tommy Hebert
Lower Neches Valley Authority
PO Box 3464
Beaumont, Texas 77704

Re: Regional Water Supply Study
LNVA Regional Planning Contract No. 94-483-036

Dear Mr. Hebert,

Enclosed is the final report of the "Regional Water Supply Study" and "Water Conservation Plan". These documents include revisions which resulted from the public meeting held on April 18, 1996. We are forwarding twelve copies of the report to the Texas Water Development Board and one copy to each of the participating entities.

We appreciate the opportunity to be of service on this project.

Sincerely,



Gary J. Graham, P.E.
Vice President



Ricky J. Bourque, P.E.
Project Manager

cc: Mr. Dennis Crowley, P.E./Texas Water Development Board

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INTRODUCTION

PLANNING AREA

The planning area for the LNVA regional water planning study covers portions of Jefferson and Hardin Counties in Southeast Texas (Exhibit 1). The area consists of all of Jefferson County (*excluding the sparsely inhabited southern third*) and the southeastern portion of Hardin County. The largest cities within the area are Beaumont, Port Arthur, Nederland, Port Neches, and Groves, all in Jefferson County. Other cities and communities within the area include Central Gardens, Beauxart Gardens, Hamshire, Fannett, China, Nome, and Bevil Oaks in Jefferson County; and Sour Lake, Pinewood, Rose Hill Acres, Lumberton, and Kountze in Hardin County.

The 1995 population of the planning area is estimated at 251,230 including 235,130 in Jefferson County and 16,100 in Hardin County. The largest city is Beaumont (1995 population 117,952), followed by Port Arthur (1995 population 60,110). Other portions of the planning area range from vast unpopulated rural areas to cities in the 10,000 to 20,000 range.

The entire area lies in the Beaumont-Port Arthur-Orange metropolitan area.

Most major communities in the planning area are participating in the study, either as cities or water districts. Sponsoring entities, in addition to the Lower Neches Valley Authority, are as follows:

Jefferson County communities:

Beaumont
China
Groves
Nederland
Nome
Port Arthur
Port Neches
Bevil Oaks Municipal Utility District
West Jefferson County Municipal Water District (*Hamshire-Fannett area*)

Hardin County communities:

Kountze
Sour Lake
Lumberton Municipal Utility District
(*Lumberton, Rose Hill Acres, and vicinity*)

Jefferson County is part of the Golden Triangle which encompasses Beaumont and Port Arthur in Jefferson County and Orange in Orange County. Together with Hardin County, these counties make up the Beaumont-Port Arthur-Orange metropolitan area. Dominant industries in the area include petroleum refining and chemical and plastics industries, with two large paper mills a short distance north of the Triangle. Shipyards and a steel mill are also located in the Triangle. In recent years, Jefferson County south of Beaumont has become the home of various state, federal, and county correctional facilities.

Hardin County, especially within the planning area, contains a large proportion of commuters working in Jefferson and Orange Counties or at a paper mill in nearby Evadale. The dominant industries are timber industries at Silsbee (*outside the planning area*) and Kountze, although some fabricating and septic tank industries can be found in the area. Oilfield drilling and production is still significant in the county, and two small refineries are located in the county north of the planning area.

Jefferson County agriculture consists mainly of rice and soybeans. Timber is the main Hardin County crop, along with Christmas trees, beef cattle, and related feed crops.

The Lower Neches Valley Authority, a river basin authority created by the state government, supplies raw surface water to a number of communities and industries in Jefferson County, including several of the participants. The project as outlined in the related planning study would extend the LNVA water supply to the remaining participants in both counties.

The area covered by this generalized Water Conservation Plan will include the entire planning area with regard to any measures to be taken by the LNVA concerning its existing raw water supply. Additionally, the water systems and wholesale customers of the various participating communities which have not previously developed water conservation plans are covered by this plan. The following participants have already developed and/or implemented water conservation plans for other projects:

City of Beaumont
City of Nederland
City of Port Neches
City of Groves

Lumberton Municipal Utility District

Adoption and implementation of one or more water conservation plans will be required in the future only in the event of Texas Water Development Board financing for projects, as discussed later. Each entity participating in or served by one of the projects must adopt a water conservation plan or relevant provisions of a plan which has been developed for another entity or for several entities jointly.

PROJECT

This water conservation plan has been developed as a requirement of a Regional Water Planning Study which is funded in part by a planning grant from the Texas Water Development Board. The study addressed the present and future water supply needs for the planning area in various categories including municipal, industrial, and agricultural usage. The study considered the limitations and the foreseeable deterioration of the existing ground water supplies serving portions of the planning area, and evaluated alternate means for surface water supply in lieu of existing ground water usage. The recommended project includes three new surface water treatment plants and associated intake and transmission facilities as follows (see Exhibit 2):

Regional Plant No. 1. The plant (23.13 mgd ±) would be located west of Beaumont where an LNVA canal crosses Highway 105 and would draw water from the adjacent canal. A relatively short transmission line for treated water would extend east to Beaumont. Another transmission line would extend west to Bevil Oaks (*served by Bevil Oaks Municipal Utility District*) and continue west to Sour Lake.

Beaumont presently takes roughly half of its water supply from wells in southern Hardin County and the remainder from the Neches River through its own surface water plant. Bevil Oaks and Sour Lake depend entirely on ground water. The new plant, when it becomes necessary, will replace and/or supplement existing ground water usage.

Other potential customers for this plant, although not participants in the study, are Meeker Municipal Water District in Jefferson County and Hardin County WCID No. 1 (Pinewood) in Hardin County.

The Beaumont regional plant and associated transmission lines are expected to cost approximately \$39 million **based on current construction prices.**

Regional Plant No. 2. This plant (9.42 mgd) would be located near the intersection of U. S. 69 and West Chance Cutoff in Lumberton, approximately six miles north of Pine Island Bayou. A raw water intake station would be located on Pine Island Bayou a short distance west of U. S. 69, with a raw water line extending from the intake to the plant. A transmission line for treated water would extend north to Kountze. Treated water would also be fed into the nearby distribution system for the Lumberton Municipal Utility District.

Lumberton and Kountze presently depend entirely on ground water. The new plant will replace and/or supplement existing ground water usage.

At least one other potential customer for the plant, although not a participant in the study, is the Quail Valley Water Supply Corporation, serving a subdivision on U. S. 69 north of Lumberton.

Regional Plant No. 2 and associated intake station, raw water line, and transmission line are expected to cost approximately \$23 million **based on current construction prices.**

Regional Plant No. 3. This plant (0.51mgd) would be located in the north end of China where an LNVA canal crosses North China Road and would draw water from the adjacent canal. This plant would serve only the City of China, supplementing or replacing its existing ground water supply. Approximate cost is \$ 1.6 million **based on current construction prices.**

All or much of the costs for each division of the project are expected to be financed by the TWDB through Texas Water Development Board Funds or the Water Assistance Fund.

UTILITY EVALUATION DATA

Utility evaluation data which is required as part of an actual water conservation plan, as specified in the TWDB format, will be provided on forms similar to Exhibit 3.

NEED FOR AND GOALS OF THE PROGRAM

Of the \$126,000 cost of the study, \$63,000 is financed through a planning grant from the TWDB and the rest by funds from the LNVA and from the participating cities and water districts as listed previously. The design and construction costs for all components of the project are expected to fall into the \$60 million range (year 2000 cost), but implementation may be delayed for a number of years. Some implementation costs are expected to be financed through the SRF program and/or other TWDB loan programs.

One requirement of any TWDB loan in excess of \$500,000 is that the entity develop a program for water conservation and emergency demand management and receive program approval by Board action (TWDB) following TWDB staff review. The approved program, including any stipulations contained in Board approval, must be implemented by the entity before closing of the loan and approved by the Board in an implemented form.

In this case, the requirement for development (*not necessarily implementation*) of the Water Conservation Program has been made a condition of the Planning Grant. The Water Conservation Program must be developed as a part of the Regional Water Supply Study, and the anticipated savings in water usage are to be considered in sizing of the water facility improvements to be identified in the study.

Since this program developed under the Planning Grant is generalized, it will need to be further developed into one or more specific programs at the time the project (*or portions thereof*) is implemented with TWDB funds. It appears at present that individual programs will be required for the cities of China, Sour Lake, and Kountze as well as the Bevil Oaks Municipal Utility District. (*Each such program should be tailored just before implementation to reflect local conditions, updated background data, and local preferences where applicable.*) Also, the existing approved programs for the City of Beaumont and the Lumberton Municipal Utility District may require minor modifications to conform with any new requirements which the TWDB may impose at the time.

If the LNVA itself directly participates in the water project as an owner of the facilities, an individual program may also be required for the LNVA, although many of the typical program requirements would have to be passed on to the various wholesale customers.

Alternately, it may be possible to develop a master program for the LNVA (*or for any new water supply authority which may be created to own/operate the facilities*) and have each served

community adopt relevant provisions of the program. However, given the diversity of the communities in the area and the preference for political independence, individual programs may prove more feasible.

The requirement for the Water Conservation Program is contained in House Bill No. 2 and House Joint Resolution No. 6, 69th Texas Legislature, 1985. This program is required for all communities receiving new state (or state administered) loans of more than \$500,000 for water or sewer projects.

The two main divisions of the program are (1) a water conservation plan to reduce water usage on a year-round basis and (2) an emergency demand management plan to minimize hardship during a water shortage. State guidelines (Exhibit 5) prescribe eleven elements of the water conservation plan and six elements of the emergency demand management plan to be considered in designing the program. All of these elements will be covered in following sections.

The total reduction in water usage is expected to be less than the reduction for an average community. Since Hardin and Jefferson Counties receive some of the highest amounts of annual rainfall in the state, outdoor watering is not as prevalent as in arid areas. Indoor domestic use also seems to fall below average. Total residential water usage for various communities in the planning area is approximately 0.17 to 0.54 gallons per minute per connection on an annual average.

In the Southeast Texas area, the underlying needs for the program are somewhat different from those of Central or West Texas communities. Ground and surface water are presently available in the area in abundant quantities. Much of Jefferson County is supplied with surface water from the Neches River basin through the LNVA canal system. The LNVA has sufficient surface water rights, along with a sufficient water supply, to supply its customers for many years at current growth trends. Beaumont likewise draws part of its water supply from the Neches basin through its own intake facilities, with the remainder supplied by wells. Communities in other portions of the planning area use ground water for all or part of their supply. The ground water supply also appears adequate for many years, although some wells may eventually have to be relocated farther inland to escape salt water intrusion.

However, changing conditions could contribute to a scarcity of water in Southeast Texas in the future. One possible problem for this area could be diversion of surface water to other river basins as a result of high population growth in those basins. As an example, the nearby Sabine River Authority has been considering the feasibility of diverting water to the Houston area. State or federal policies could possibly encourage or mandate such diversions in the future, to the detriment of areas such as Southeast Texas.

Other potential causes of future water shortages include surface and ground water pollution; abandonment of wells because of excessive ground settlement or salt water intrusion; and increasingly stringent federal drinking water standards.

In response to the possibility of future water shortages or the need to convert to surface water, the Lower Neches Valley Authority and the participating communities have sponsored the regional water supply study, which contains recommendations for the project elements described above.

The water conservation program is expected to become more effective in the future if water should become scarce or more expensive, in which case the project would be implemented. By the time the need arises, local residents will have become better educated in regard to water conservation, and the necessary control mechanisms will already be in place.

The local water supply is not presently sensitive to any anticipated drought conditions. The emergency demand management plan applies to various other events which could disrupt the water supply, such as upstream river pollution, system failure, or storm damage. It can become applicable in the future to drought conditions, however.

Each community to be served by the project (*and not already covered by a water conservation program*) will adopt one or more goals upon implementation of the program. The primary goals, according to current TWDB policy, will be to minimize unaccounted-for water and to ensure that their water rate structures do not promote excess water usage. Methods of meeting the accountability goal include reduction of leakage and periodic meter checking or replacement. The communities may also adopt goals for reduction of per capita usage.

WATER CONSERVATION PLAN

PLAN ELEMENTS

EDUCATION AND INFORMATION

1. General.

Education and information alone would probable have little effect on residential water consumption. Many local residents are preoccupied with current economic conditions. Although utility bills are of major concern to local residents, electric bills which run up to several hundred dollars per month in the summer receive much more attention than a water/sewer bill of \$20 to \$60. Some residents who are very affluent may be unconcerned with water conservation unless their water supply is threatened. The education and information program may reduce water usage by several percentage points, provided it includes an emphasis on economic incentives.

The proposed method of education and information consists of flyers and printed messages on billing notices, plus possible press releases in the local newspaper. Flyers will vary from time to time, including items such as TWDB brochures (example, Exhibit 4); information on incremental water and sewer rates; and a copy of the press release (Exhibit 5). The flyers will be hand delivered either alone or with other items for the customer.

2. First Year, Long Term, and New Customers

The distributions are planned for twice a year (*at least twice by flyer and other times by printed messages*) just prior to high usage periods until the loan(s) are paid off or until otherwise released by the TWDB. The first flyer is expected to include the press release (Exhibit 5) plus any supplementary information needed at that time.

New customers will be supplied with fact sheets and brochures similar to those mailed out, to the extent necessary to make them aware of the program. The applicable entity(ies) will assemble packets as soon as possible after program implementation so they will be on hand to give to new customers.

WATER RATE STRUCTURES

Water rates for the participants in this study are based on uniform rates. The minimum quantity for billing averages about 2,000 gallons per month with a minimum uniform rate averaging approximately \$8.00. Additional usage is charged, on an average, at \$2.50 per 1,000 gallon units at an average. Raw water supply is charged on a uniform rate for consumption.

Exhibits 6 and 7 are sample ordinances by which a typical community may establish a system for calculating water rates and codify the initial rates under the new system. The water rates will be reviewed periodically and adjusted if additional revenues are necessary.

UNIVERSAL METERING

All private water usage (excluding firefighting and related drills) is metered.

The best means to improve water accounting would be to meter certain City or District water usage. It is recommended that each entity add meters where practical such as for office and shop use, as well as any water which may be used in wastewater treatment plants. Some uses, however, would be impractical to meter including the following:

1. Water line flushing, repair, and sterilization.
2. Sewer line and lift station testing and maintenance.
3. Firefighting, related drills, and hydrant testing.

The volume of water used for line flushing may be difficult to estimate without a portable meter. Continuous accounting of other uses is impractical or burdensome. In the case of firefighting, it would divert firemen from their primary purpose. However, after adoption of each individual water conservation plan, the entity will contact the TWDB staff regarding methods to account for these uses.

Each entity will continue to require individual meters for all new construction. Meter testing will be conducted in accordance with state guidelines (annually for 1" meters or larger, every 10 years for smaller meters). Testing will also be performed in cases where apparent problems with meters are noted.

LEAK DETECTION AND REPAIR

Discovery of leaks in the distribution system is usually accomplished by two methods:

1. Unusually low pressure at any point in system.
2. Leaking line results in water appearing on ground surface.

In either case, an electronic listening device can be used if necessary to pinpoint the leaks.

Line repairs are performed by City or District personnel using whatever adapters are necessary for similar or dissimilar materials. In the event that leakage results from slippage of fittings, they can replace existing fittings with mechanical joint fittings. Repairs are performed in accordance with Rules and Regulations for Public Water Systems, 30 TAC 290.46 (g), Texas Natural Resource Conservation Commission, including disinfection.

Much of the distribution systems are laid out in loops with valves on most segments. Many repairs can be made, therefore, by isolating short segments without affecting large parts of the system. However, most outlying areas are connected to the central system through a single transmission line, although those areas may contain internal loops. Consequently, any repairs on those transmission lines leave those areas without water service for a time.

Leaks may present a water loss problem periodically, but no quantification of leakage losses is readily available.

The individual system suppliers prepares monthly internal reports including total water production for each well or (treatment plant) and total sales. Monthly reports are submitted to the TNRCC covering total water pumpage, number of active water services, treated water quality, disinfectant usage (particularly chlorine dioxide), and water quality violations (if any).

Unauthorized water usage is not believed to represent a significant amount of water loss. City or District meter readers are kept posted of any new, removed, disconnected, or reconnected meters. They will generally notice any residential or commercial facility which appears occupied but is not listed as having an active meter. Although a property owner could construct a supplementary tap illegally, most local residents do not have the necessary skills and equipment. Few licensed plumbers would construct an illegal tap for fear of losing their licenses or local permits. Unauthorized use of fire hydrants is believed to be negligible or non-existent.

IMPLEMENTATION AND ENFORCEMENT

The following assignments of various functions of water conservation programs represent a typical medium sized city. These assignments will vary among cities and water districts.

1. Education and Information. City personnel under supervision of Water/Wastewater Superintendent, with possible assistance from City's consulting engineer.
2. Water Rate Structure. The City Council will enact the ordinances codifying the existing water rate structure and the appropriate rate schedules. Enforcement powers include termination of water service.
3. Universal Metering. District personnel under supervision of Water/Wastewater Superintendent This will for some communities be simply a continuation of the existing practice.
4. Leak Detection. District personnel under supervision of Water/Wastewater Superintendent.
5. Review and Evaluation. City Manager with possible assistance of consulting engineers. Along with review and evaluation, City Manager will submit required reports to Texas Water Development Board.

6. Water Conserving Landscaping. Not applicable.
7. Pressure Control. Not applicable.
8. Recycling and Reuse. City Manager may make recommendations to selected large commercial users if appropriate; action to be taken by users at their option. City will, if appropriate, practice a small amount of recycling, including use of treated wastewater effluent for chlorination water, plant washdown, wash water for sludge dewatering, and watering grass on site.
9. Retrofit Programs. Any mandatory retrofitting would be required under Item 10 below.
10. Plumbing Codes. [NOTE: Most cities in this area have already adopted the Standard Plumbing code (*whichever edition was current at time of adoption*). However, few if any have adopted its optional water conservation provisions (*except in the process of adopting water conservation programs*).] In connection with the water conservation plan, the City Council will also adopt the water conservation appendix in the Code. This appendix will supplement the plumbing efficiency standards contained in 1991 legislation.

The City will use the plumbing code to ensure proper installation of fixtures. Enforcement will be by a plumbing inspector employed or designated by the City. Enforcement powers could include termination of water service.

REVIEW AND EVALUATION

Each city or district will review and evaluate its Water Conservation Program at least annually for various areas of concern. The review will cover all items specified in the annual letter from the Texas Water Development Board. Based on a letter and attached 1995 form (Exhibit 8), and considering 1995 changes in TWDB rules, each entity may need to review the program for the following parameters:

1. Summary of education and information activities conducted by the City over the past year.
2. Status of City Plumbing Code, including its coverage of water conservation requirements.
3. Status of retrofit program, including the amount of retrofit work performed if any.
4. Water and wastewater rate structures, including changes since previous report if applicable; also sources of any purchased water and applicable rate structures.
5. Status of metering programs including number of meters, and amount of testing, repairs, and replacement of meters.

6. Any water audits, leak detection, or leak repair employed by City, including any effects on accountability, percent unaccounted for water, sources of water accounted for, but unsold.
7. Status of water conserving landscaping, if applicable.
8. Any recycling or reuse practiced by City or at recommendation of City.
9. Other water conservation activities, if any.
10. Activation of emergency demand management plan, if any, and associated reduction in water use.
11. Public response, if any.
12. Effectiveness of program.
13. Frequency of review by operating staff.
14. Any problems in implementing program.
15. Potential means to improve program.
16. Expense incurred for programs.
17. Amount of water saved.
18. Annual improvement in water accountability.

In addition to the topics covered in the annual report, the City will review the following matters:

19. Any changes in water supply and/or demand which require more stringent implementation of the program. This includes both actual and imminent changes (such as an impending water shortage).
20. Any changes in state regulations which could require modification or more extensive implementation of the program, or which could allow relaxation of any aspects of the program.

WATER CONSERVING LANDSCAPING

Because of the high rainfall, no special landscaping requirements are proposed. In fact, many water conserving plants may not be adapted for the local soils and climate. Customers will be made aware of potential restrictions on lawn watering, however.

PRESSURE CONTROL

The terrain throughout most of the planning area is flat, with only moderate relief in the Kountze and Lumberton areas. Consequently, pressures are relatively uniform throughout each system without dividing it into pressure planes. (One exception is the outlying portion of the Beaumont system serving the prison/jail area, where an elevated tank with booster pumps serves the state and county facilities. A similar arrangement is proposed for the federal prison to meet pressure requirements higher than normal.)

Various communities in the planning area provide pressure for their water systems by booster pumps, elevated tanks, and/or hydropneumatic storage tanks. In general, such facilities serve the systems fairly well without creating excessive pressures near these facilities or at low points. If any deficiencies are encountered in outer reaches of the systems, additional pressure maintenance facilities similar to those listed above could be constructed in or near the area of deficiency. The problem area can then be isolated if necessary by pressure reducing valves and/or gate valves to keep the newly created pressure where it is needed.

However, the opposite problem, high pressure, is the potential cause of excessive water usage. That problem is more likely to occur in water systems in hilly terrain with several hundred feet of relief, where pressure maintenance facilities located on high hills can create excessive pressure in the valleys. Pressure reducing valves which isolate the valley areas are often used to relieve this situation. This problem does not occur in the planning area because of the flat or moderate terrain.

No measures for reducing pressure within any of the area water systems or in customer plumbing are necessary.

RECYCLING AND USE

Any large commercial or industrial users, as well as all car washes, should consider means of recycling process water and wastewater if they are not already doing so. The use of small static screen or filtering devices may prove to be cost effective in comparison to the rates they would have to pay for treated water. This would also effectively reduce the amount of flow to the respective sewage treatment plants (*for sewered areas*) as well.

Reuse of treated effluent is not feasible for various reasons, as follows.

The surface water supply available to the planning area through the LNVA canal system (*and through separate intakes where applicable*) should be adequate to serve local communities for many years. This is in addition to ground water supplies which presently serve portions of the area and

can be expected to remain in service for a number of years. Existing supplies can be produced, transported, and treated much more economically than treatment and reuse of effluent. Domestic reuse of treated effluent would be unacceptable to local residents considering the abundance of conventional supplies.

Reuse by local industry and return to the canal system were investigated by the City of Groves in a 1991 water reuse study and found uneconomical. Return to the canal system would almost certainly be similarly uneconomical for other communities on the canal system, as would be reuse by industry. Also, most industrial usage, as well as reuse by the LNVA, requires a higher standard of quality than is currently produced by local wastewater plants or is anticipated in the future.

Irrigation is not feasible use for treated effluent. This disposal method, if applied to the entire discharge from the plants in the planning area, would require thousands of acres of land because of low soil permeability and high annual rainfall. There are no local crops adaptable to extensive year-round irrigation. The nearest golf courses to existing plants are generally located too far away to make transportation and use economical.

Recharging of aquifers is not practical. There are no local aquifers in southern Jefferson County could supply large quantities of quality fresh water. The recharging of aquifers in the northern part of the planning area, or to the east, is basically accomplished by the high annual rainfall in their outcrop areas in various counties to the north.

Reuse of treated effluent is not proposed for the listed reasons. However, it could be considered in the future in the event that the existing sources of water for the area should become inadequate, unsatisfactory, or uneconomical.

A small portion of the treated effluent may be used within the various wastewater treatment plants for purposes such as chlorination. This feature may be considered during the design stage each time a plant is to be upgraded (or a new plant built) and implemented if cost effective.

RETROFIT PROGRAM

Retrofitting in existing structures simply for water conservation is unlikely to be accepted by area residents, especially considering the abundant supply of surface and/or ground water and the substantial cost involved. Therefore, mandatory retrofitting is recommended only for the following cases:

1. Replacement of plumbing due to wear, damage, remodeling, or modernization.
2. Displacement devices in toilet tanks (where practical).
3. Flow restricters in showers (where they can be readily installed).
4. Insulation for hot water pipes (where pipes are accessible without breaking out concrete).

The last three cases represent low cost measures which are easily implemented. However, it is anticipated that the entities adopting water conservation plans will employ these measures only during severe or prolonged water shortages.

PLUMBING CODES

Several communities in the planning area have adopted the Standard Plumbing Code. Some others may be governed by county requirements, or may have adopted other standard plumbing codes. It is probable that none of the communities have adopted the optional water conserving provisions of the Standard Plumbing Code except for those which adopted them in connection with water conservation programs for previous projects. However, all communities are governed to some extent by 1991 legislation (Senate Bill 587) regarding water conservation and plumbing efficiency standards.

It is anticipated that all communities which adopt water conservation plans in connection with the project will adopt the Standard Plumbing Code, if they do not already have a plumbing code. Also, each such community is expected to adopt the optional appendix in the Code providing water conservation measures, with minor amendments as required to meet state standards (sample ordinance, Exhibit 9). Alternately, some communities without the Standard Plumbing Code may take equivalent measures.

Also included in the anticipated ordinance are plumbing retrofit requirements, to be imposed only if warranted by water shortages or future state regulations.

Additionally, some older homes will be abandoned or demolished within the period and will be replaced by new residential construction. Also, many existing homes may undergo modernization or replacement of fixtures within the design period. Therefore, conservation measures in new construction could save a significant amount of water by the end of the 50 year planning period.

ANNUAL REPORTING

Each affected community will submit annual reports to the Texas Water Development Board, covering all elements prescribed annually by the TWDB, for the life of any loans which they might obtain from the TWDB for the project, plus any other loans which they might obtain from the TWDB for other water or sewer projects (unless otherwise released by the TWDB). (See Exhibit 10 for sample resolution.)

CONTRACTS WITH OTHER ENTITIES

No attempt has been made in this generalized water conservation plan to assemble the various contracts for raw water supply, wholesale water service, and wholesale sewer service applicable to the communities in the planning area. It is anticipated that any actual water conservation plans which may be developed for the project will contain copies of applicable contracts, including, as appropriate, contracts related to the regional water plants.

EMERGENCY DEMAND MANAGEMENT PLAN

GENERAL

Of the communities to be served by the project, China, Bevil Oaks, Sour Lake, Lumberton, and Kountze each presently use one or more wells for all water supply. Beaumont has three wells (within Lumberton) which supply roughly half of its water, with the remainder drawn directly from the Neches River and treated in the City's surface water plant. The LNVA supplies raw water to most other communities in the planning area through its canal system, but not to the affected communities. The LNVA water comes from the Neches River and from its tributary, Pine Island Bayou. Each community receiving the LNVA water treats it in a local plant, as do a number of industries purchasing raw water directly from the LNVA.

After project completion, Regional Plant No. 1 (located west of Beaumont) will take raw water from the adjacent LNVA canal. Part of the treated water will be pumped east to Beaumont, where it will supplement the existing surface water plant. The remainder will be pumped west to Bevil Oaks and Sour Lake. A Regional Plant No. 3 separate treatment plant will be constructed in the north end of China next to an LNVA canal and will serve only that city.

For Lumberton and Kountze, Regional Plant No. 2 will be constructed in northwestern Lumberton, six miles from Pine Island Bayou. A new intake pump station will be constructed on Pine Island Bayou at the south edge of Lumberton, pumping raw water to the new plant. Part of the treated water from the plant will be fed into the surrounding Lumberton water system for distribution, with the remainder pumped to Kountze.

The short and long term fate of the existing ground water supplies for the communities cannot be determined accurately at this time. It should be noted that the project is unlikely to be implemented under present conditions, since the wells are relatively economical to operate and generally produce adequate amounts of good quality water. By contrast, the conditions which would induce project implementation would include the following:

- ▶ Actual or imminent salt water intrusion in the southmost wells.
- ▶ Severe lowering of water tables, resulting in diminished production rates or increased pumping costs.
- ▶ Aquifer contamination which would render the water unsafe or require special treatment.
- ▶ Severe mechanical or structural problems with the wells which would be too costly to correct in light of declining potential for ground water production.
- ▶ Growth in population or other water usage in excess of present production capacity.

It appears likely that some of the wells will be kept in operation, at least at a reduced rate, as long as they can produce water more economically than the new surface water plants. Other possibilities include keeping one or more wells for standby or peak demand usage, or even keeping selected wells in long term operation and thus reducing the size of the surface water facilities.

In any event local water supplies are expected to remain adequate over the long term, whether from surface and/or ground sources, regardless of drought conditions.

Local water supplies could be interrupted for a number of reasons. The most likely event is power failure, which could easily affect surface water plants, intake stations, and well pumps. Other possibilities include equipment failure, transmission line or canal breakage, storage or pressure tank failure, severe storm damage, severe freezing conditions, failure of the canal intake or booster stations (*or Pine Island Bayou intake station in the case of Regional Plant No. 2*), pollution of the canal system, and surface water contamination.

The wells in the various communities pump into nearby ground or elevated storage tanks. Where ground storage tanks are used, they are followed by booster pumps and then by hydropneumatic or elevated tanks. Water (*after required disinfection*) is then fed into adjacent system lines or into one or more transmission lines if the well is remote from the system. In the case of the existing Beaumont surface water plant, treated water is fed into nearby tanks and then into the system. In some communities, additional tanks are located within the systems.

The two proposed surface water plants in Jefferson County will draw raw water from the adjacent canals. Treated water will be fed into storage tanks on site. Water from Regional Plant No. 1 will then be pumped through transmission lines to the communities being served, while water from Regional Plant No. 3 will go directly into the China system. Regional Plant No. 2 will receive water pumped from the Pine Island Bayou intake station. Treated water, after passing through on-site storage, will be fed directly into the Lumberton system except for the water pumped to Kountze. In every case, the water systems receiving water from the new plants contain existing ground and/or elevated tanks either within the systems or at local wells, so that storage is not confined to the plant sites.

The water systems for the affected communities are generally well looped, although some fringe areas or outlying wholesale customers may be connected by a single transmission line.

Failure of the transmission lines from the proposed regional plants, or from existing outlying wells, would isolate those facilities from the systems they serve (*except that the nearest well for Beaumont has two separate transmission lines common to all three wells*). In the case of Regional Plant No. 1, failure of the transmission line immediately to the west would isolate both Bevil Oaks and Sour Lake from the plant. Failure of the intake line for Regional Plant No. 2 would isolate that plant from its water supply, although the plant could continue operating from raw water storage on site. There are several unlooped transmission lines to wholesale customers which, if they should fail, would cut off water service to those customers.

Any water supply emergency, whether acute or protracted, requires a responsible agency to manage the situation. Such crisis management includes maintenance of the existing supply if possible, controlling or restricting usage in order to conserve water, and obtaining alternate sources of supply if necessary. In most cases, the individual communities, as the water purveyors, will assume this responsibility. Problems directly related to the regional surface water plants or to their intake facilities will be addressed by whatever authority owns and operates the plants. In the event of

disasters such as major storms, riots, or acts of war, some of the functions of the communities or treatment plant authority may be overridden by emergency management authorities.

TRIGGER CONDITIONS

1. **Identification of Responsible Authority.** As stated above, it is anticipated that each city or water district served by the project will be responsible for monitoring for trigger conditions and any pursuant crisis management to the extent that (a) the problem lies within its own system or facilities or (b) its own customers are affected by the crisis. In the case of proposed surface water plants or related intakes, the authority operating the facility (possibly LNVA) will assume responsibility for monitoring and crisis management related to problems with those facilities, but must if appropriate notify the individual communities of the problems. It is assumed at present that treated water transmission lines which are common to more than one community (Bevil Oaks and Sour Lake) are under the jurisdiction of the treatment plant authority.

For simplicity, the term "Authority" will be used in this generalized water conservation plan in many cases to mean the entity responsible for whichever facility is pertinent to the discussion. In some cases, more specific references must be made, as in the case of communications between entities.

The term "governing body" will represent the Board of Directors in the case of a water district or the LNVA; the City Council in the case of a city; or appropriate governing body of any special authority which may be created to own/operate one or more of the surface water treatment plants to be constructed in the project. The term "executive officer" will represent the chief executive officer of each entity, and/or the official which each entity designates as being responsible for the overall operation of its water department (*such as the Water Utilities Director for the City of Beaumont*).

2. **Goal of Policy.** The trigger conditions listed below are intended as guidelines to help the Authority determine (a) when it is necessary to implement preliminary or emergency measures, (b) which measures should be implemented, and (c) the extent of such measures. The guidelines can also be used to help decide whether to upgrade, continue, downgrade, or terminate the measures which have already been taken in a given situation.

These guidelines are not intended to be followed automatically and blindly. An automatic approach might be preferable for communities with a recurring problem of a fixed nature, such as limited transportation/treatment capacity or a surface reservoir subject to depletion during a drought. However, in the case of the Southeast Texas area, no recurrent problems are anticipated in the immediate future. Although the existing ground water supplies may deteriorate in coming years, once they are replaced or supplemented by the facilities in the project the local water supplies should be reliable all year round. In any event, the Authority needs to be prepared for the unexpected.

In any water supply emergency, the Authority must rely chiefly on the judgement of its

executive officer and his subordinates, along with any specialized advice which they might obtain. These guidelines are intended to help the Authority assess a situation and make necessary decisions more easily. In no event are they meant to replace the sound judgement of Authority personnel.

3. Focus Of Emergency Measures. In the event of a water supply emergency, the Authority will act toward one or more of the following goals:
 - a. Keeping existing supply and/or distribution systems operative.
 - b. Preventing further loss or contamination of water.
 - c. Controlling or restricting usage in order to conserve water.
 - d. Preventing public health problems which could result from a contaminated water supply.
 - e. Obtaining alternate sources of water.
4. Basis for Trigger Conditions-General. Most trigger conditions for Southeast Texas will be qualitative rather than quantitative. Particular attention, however, must be devoted to several measurable parameters: the rate of total water usage, the levels of water in the clearwells and the elevated storage tanks, the water levels in the Neches River and Pine Island Bayou, *ground water quality, and water levels in aquifers*, along with the duration of critical values for these parameters. The Authority could also easily monitor the water level in the canal at each withdrawal point and compare the level against the level at which its intake is affected.

It appears that each community will rely primarily on the LNVA for long term planning in regard to raw water supply. Each community should maintain good communication with the LNVA regarding any factors which may point to long or short term shortages.

For long range planning (as long as any of the affected communities continue to use wells or to maintain them as standby sources), the distance between the wells and any approaching salt water encroachment should also be monitored. Relevant information may be available from time to time from various federal, state, or local government agencies such as the TWDB, the Texas Natural Resource Conservation Commission, or the LNVA.

A number of factors can govern system capacity--stream flow, pumping capacity (for the canal system, for each raw water intake, for each transmission line, and for each community), treatment capacity, storage capacity, and transportation/distribution capacity. *For ground water supplies, aquifer capacity, well size and depth, and well pumping capacity also come into play.* The Neches River and Pine Island Bayou at the intake points

are fed by well over 90% of the 10,011 square miles of the Neches River Basin. If managed properly, these streams should have adequate capacity for the Southeast Texas area for many years.

5. Sources of Supply. As stated earlier, the water supply for the affected communities comes from various sources, both at present and in the future after project completion, as follows:

- ▶ Beaumont: · City surface water treatment plant, intakes from Neches River, 30 mgd capacity.
 - Three wells in Hardin County, pumping capacities 6.67 mgd, 6.72 mgd, and 4.68 mgd.
- ▶ China: · Three wells within City, capacities 0.46 mgd.
- ▶ Bevil Oaks: · Well within District, capacity 350 gpm, with 90 gpm standby well.
- ▶ Sour Lake: · Two wells: 278 gpm just south of the City and new 500 gpm well several miles to west; a nearby 276 gpm well has been or will be abandoned in near future.
- ▶ Lumberton: ▶ Three wells within District, pumping capacities 650 gpm, 600 gpm, and 2100 gpm.
- ▶ Kountze: · New 800 gpm well in City; also, 274 gpm well in City temporarily out of service because of sand intrusion, may be reworked for standby with reduced capacity estimated at 200 gpm; a 453 gpm well in City has been or will be abandoned in near future.

After project completion, water sources can be summarized as follows:

- ▶ Beaumont: · Share (21.76mgd) of Regional Plant No. 1, plus City surface water plant, 30 mgd capacity;
- ▶ China: · Regional Plant No. 3, 0.51 mgd.
- ▶ Bevil Oaks: · Share (0.60mgd) of Regional Plant No. 1.
- ▶ Sour Lake: · Share (0.77 mgd) of Regional Plant No. 1.
- ▶ Lumberton: · Share (8.16 mgd) of Regional Plant No. 2.
- ▶ Kountze: · Share (1.26 mgd) of Regional Plant No. 2.

6. Storage and Pressure Maintenance. Storage and pressure maintenance facilities for the various communities are widely varied. Exhibit 11 provides a summary of the storage in the participating entities.
7. Distribution. Each community (as well as Beaumont's two wholesale customers) has its own water distribution system. Line sizes range as high as 30" for some of the Beaumont lines. The Beaumont and Lumberton systems are continuously being extended in various locations by developers, while China, Sour Lake, and Kountze are subject to occasional extensions. Bevil Oaks is a developer district in which essentially all water lines have already been completed.
8. Standby Power. Various communities have provisions for standby power for their water systems. Consideration will be given in project design to providing the various new treatment plants with standby power, as well as the raw water intake for the Lumberton regional plant.
9. Previous Analysis of System. Due to the size of the study area this item was not reviewed as part of this study.
10. General Considerations. In establishing trigger conditions, it is necessary to consider the various events which could disrupt or impair water service to one or more parts of the systems in the various communities. Most events would cause only localized problems or slight reductions in the level of service. Severe curtailment of service for one or more entire systems is not expected to occur except in the following cases:
 - i. Widespread, prolonged power failure involving *wells*, surface water plants, and/or pumping stations serving the communities involved in the project.
 - ii. Severe pollution of the streams(s) *and/or aquifer(s)* serving the communities.

Various events which could result in water shortages or reduction in service include the following:

- a. Water Supply. Power failure involving surface water intakes, surface water treatment, *wells*, or pumps; pump or other equipment failures; contamination of raw surface water *and/or ground water including future salt water intrusion*; lowered river level due to unforeseen situations such prolonged drought with total impoundment upstream; *severe lowering of water level in aquifer*.
- b. Water Transmission. Transmission line breaks on various lines which are the sole connections for outlying portions of the system for any community, for a wholesale customer, for a surface water plant remote from its raw water supply, *for one or remote*

wells serving a community, or for a community dependent on a regional plant; or, for Beaumont, failure in a canal supplying the City water plant.

- c. Storage. Structural failure or contamination in ground storage or elevated tanks or in raw water reservoirs.
- d. Treatment. Failure of major components of a surface water plant; *failure of chlorination equipment in one or more wells.*
- e. Service and Booster Pumping. Power or equipment failure; contamination.
- f. Distribution System. Major line breaks; heavy demands for firefighting; contamination.

Firm (or safe) system capacity, which could be developed from the questionnaires, can be taken presently as shown below for the various communities:

- ▶ Beaumont: · 47 mgd, based on 17 mgd sustainable for three wells combined, plus 30 mgd for surface water plant.
- ▶ Bevil Oaks: · 0.13 mgd, based on 90 gpm standby well. (*Very conservative value, since new well is sized at 350 gpm.*)
- ▶ Sour Lake: · 0.4 mgd, based on 278 gpm for smaller of two wells. (*Water quality would suffer somewhat in event of dependence on 278 gpm well, since it supplies water with relatively high mineral content. Water from this well must be mixed with water from the new water well to produce a water supply meeting current standards.*)
- ▶ Lumberton: · 1.8 mgd, based on well pumping capacity with largest well out of service.
- ▶ Kountze: · 0.288 mgd, based on 200 gpm for standby well after reworking.

11. Mild Conditions

These trigger conditions are to be taken as being generalized, subject to adjustment at the discretion of the individual communities. These conditions are designed to represent both existing conditions and conditions following project implementation. An updated set of

trigger conditions should be prepared for each community and incorporated into an individual water conservation to be adopted at the time the project is implemented for that community.

- a.* Water demand is approaching the safe capacity of the system on a sustained basis. Sustained water usage over 80%-90% of safe capacity (five consecutive days) should be taken as a trigger condition for mild conditions.
- b.* Additional sources of pollution, serious enough to threaten quality of water at intakes for LNVA canals, or for Regional Plant No 2, are reported within the Neches River basin; *or mild contamination is noted in the well water, but water can still be treated by existing facilities by means such as increasing chlorine dosage; or contamination is reported in updip portions of aquifer; or brackish water in aquifer is approaching well field.*
- c.* *Additional well drilling in the vicinity threatens interference with wells serving one or more of the communities.*
- d.** Water levels in tanks are consistently below $\frac{3}{4}$ full (five days uninterrupted).
- e.** Local power failures are imminent as a result of power station failures, storms, electrical transmission problems, or excessive power demand in the area.
- f.** Performance of surface water pumps (including pumps for LNVA canals), *well pumps*, service pumps, or other equipment indicates imminent failure; or one well is out of service for a prolonged period during season of high demand.
- g.** A hydropneumatic tank is out of service during a period of high demand.
- h.** Water levels in Neches River and Pine Island Bayou are consistently below levels recommended by LNVA as representing mild conditions.
- i.** Neches River flow is well below normal, and other water users along river are threatening to deplete the supply.
- j.** Raw water transmission line from Pine Island Bayou to Lumberton regional plant is in danger of imminent failure.
- k.** One or more transmission lines which serve as sole connections for outlying areas, for wholesale customers, or communities served by regional plants are in danger of imminent failure.

- l.** Levees are approaching failure conditions in portions of the canal system which are vital to providing Regional Plants No. 1 and 3 with raw water.
- m.*** Water supply emergencies in outlying communities receiving wholesale water service could require diversion of local water supplies. [Applies only to Beaumont at present.]
- n.*** Water supply emergencies in other communities or industries receiving raw water from LNVA could require diversion of available raw water. [Would not apply to Regional Plant No. 2 except during very low stream flow.]
- o.*** Severe freezing conditions are forecast, and widespread breakage of home plumbing or water treatment or storage units, and/or breakage of distribution lines, is anticipated.
- p.*** One or more of the communities is under a severe storm warning and falls in the path of the storm.

12. Moderate Conditions

See note under Mild Conditions above regarding the generalized nature of all trigger conditions in this water conservation plan.

- a.* Water demand occasionally reaches safe limit of system (two days within a 30 day period), and failure of any pump, chlorine feeder, or surface treatment unit could reduce the level of service to the system.
- b.* Contamination of *well or river water* is approaching limit of treatability with existing facilities; *or brackish water is very near the well field.*
- c.* *Additional wells in vicinity are drawing water at a rate which interferes with production rates of Authority's wells.*
- d.** Over 20% of storage tank capacity is out of service due to structural failure, leakage, maintenance, or contamination.
- e.** Water level in tanks is consistently below half full (three days uninterrupted).
- f.*** *Power failure has put two wells (one well for communities with only two wells) out of service during season of high demand. [Will become inapplicable, or will become mild condition, after project implementation.]*
- g.** *A well, related facilities, or a surface water treatment unit has been damaged from a severe storm.*

- h.*** One or more *well or* surface water pumps have failed because of mechanical problems, but several pumps remain operable.
- i.** Two or more hydropneumatic tanks are out of service during a period of high demand.
- j.** Water levels in Neches River and Pine Island Bayou are consistently below levels recommended by LNVA as representing moderate conditions.
- k.** Neches River flow is far below normal, and other water users along river are close to depleting the supply.
- l.** Raw water transmission line from Pine Island Bayou to Regional Plant No. 2 is losing large amounts of water from leakage, but some water still reaches plant.
- m.** One or more transmission lines which serve as sole connections for outlying areas have failed.
- n.*** Levee failure has shut off supply of raw water to Regional Plant No. 3, and it will be several days before the supply can be resumed. [Will apply also to Regional Plant No.1 with regard to Bevil Oaks and Sour Lake unless those communities retain adequate standby well capacity.]
- o.** Water emergencies in adjacent communities receiving wholesale water service require diversion of so much water that the level of service to any part of the community's system is threatened. [Applies only to Beaumont at present.]
- p.*** Water supply emergencies in other communities or industries receiving raw water from LNVA require diversion of so much raw water that the level of service to any part of the community's system is threatened. [Would not apply to Regional Plant No. 2 except during very low stream flow.]
- q.*** Severe freezing conditions have resulted in widespread damage to home plumbing distribution lines, and/or filter compartments in surface water plants.

13. Severe Conditions

See note under Mild Conditions above regarding the generalized nature of all trigger conditions in this water conservation plan.

- a.* Water demand is exceeding safe capacity on a regular basis (five consecutive days).
- b.* *Well and* surface water are so contaminated that they cannot be treated with existing facilities, or such contamination is imminent because of nearby *aquifer*

or stream pollution.

- c.* *Pumpage from nearby wells is seriously disrupting production from Authority's wells.*
- d.*** Water levels in elevated tanks are too low to provide adequate fire protection (generally less than ¼ full).
- e.*** Over half of storage tank capacity is out of service.
- f.*** Rupture of distribution lines has resulted in loss of water from storage tanks, and the wells and/or surface water plant(s) are not capable of refilling tanks quickly.
- g.** An immediate health or safety hazard could result from actual or imminent failure of a system component.
- h.*** *All well pumps are out of service.*
- i.*** Two or more hydropneumatic tanks are out of service along with associated booster pumps.
- j.*** Water levels in Neches River and Pine Island Bayou are consistently below levels to be recommended by LNVA as representing severe conditions.
- k.*** Neches River flow is severely below normal, and other water users along river, along with LNVA, are using more water than the river can supply.
- l.** Raw water transmission line from Pine Island Bayou to Regional Plant No. 2 is out of service.
- m** One or more transmission lines which serve as sole water sources for communities served by regional water treatment plants have failed.
- n.*** Levee failure has shut off the supply of raw water to one or more communities served by regional water treatment plants, and it will be an extended length of time before the supply can be resumed.
- o.*** Water emergencies in adjacent communities receiving wholesale water service require diversion of so much water that the level of service to any part of the community's system is threatened. [Applies only to Beaumont at present.]
- p.*** Water supply emergencies in other communities or industries receiving raw water from LNVA require diversion of so much raw water that the level of service to any part of the community's system is threatened. [Would not apply to Lumberton regional plant except during very low stream flow.]

q.*** *Storm damage has put all wells out of service.*

*Initiated by governing body.

**Initiated by executive officer or governing body.

***Initiated by executive officer or delegated personnel

14. Termination of Emergencies. Trigger conditions for termination or downgrading of an emergency are not broken down by severity of crisis but are listed as one group. Authority's personnel and/or governing body must use judgement as to whether to upgrade, continue, downgrade, or discontinue an emergency.

The decision to terminate or downgrade an emergency will normally be made at the level (Authority's Governing body or official) at which the emergency was declared.

Emergencies will be terminated or downgraded in events such as the following;

- a. Water demand has been reduced to safe levels and is expected to remain stable.
- b. Actual contamination of water supplies is ended or is under control; or threat of contamination has subsided; or alternate supply has been obtained on temporary or permanent basis.
- c. *Interference from neighboring wells is under control; or existing wells have been upgraded or supplemented.*
- d. Power has been restored and no additional power failures are anticipated.
- e. Failure of system components has been averted or repaired; or, temporary units have been substituted; or alternate supplies have been obtained.
- f. Water emergency in adjacent communities is ended or mitigated.
- g. Water levels and flows in the Neches River and Pine Island Bayou have improved substantially.
- h. Water levels in clearwells or elevated or ground storage tanks have been restored to normal.
- h. Freezing conditions have ended without damaging the water system; or damage has been repaired.

- i. The storm has passed without damaging the water system; or damage has been repaired.

EMERGENCY DEMAND MANAGEMENT MEASURES

1. **General.** The sample ordinance by the Authority (Exhibit 12) contains measures such as prohibition or restriction of outdoor water use; a standby pricing structure with higher incremental prices than for normal conditions; flow restricting devices; and a standby rationing plan with penalties for metered usage in excess of a preset limit. The ordinance provides for certain actions to be taken by the Authority's governing body and/or by the executive officer in the event of water shortages.

Of the various communities scheduled for service by the surface water plants included in the project, only Beaumont presently has outside wholesale customers. The City serves two small water districts plus small areas of a third district located just outside the City. In addition to these wholesale customers, the City serves a growing community of state and county correctional facilities south of the City, with a nearby federal prison under construction. The City also supplies large volumes of raw water to a refinery adjacent to the City in addition to potable water service for various industrial, commercial, and residential customers outside the City.

Other communities presently have no wholesale customers. Except for almost 100 customers just outside Sour Lake, these communities also have only a few outside retail customers. Some communities such as Lumberton have a potential for future wholesale customers in nearby residential communities.

Restrictive use of water would be required of existing and future outside users during any drought emergencies.

It may be a number of years before any of the communities will need additional or alternate water supplies. Except for recently constructed wells for Sour Lake and Kountze, no additional sources of water are anticipated in the near future. The only new water sources planned within the next several decades are the surface water plants included in the project.

None of the communities presently have emergency interconnections with neighboring systems. Considering the size of each community and the sizes and locations of neighboring water systems, Beaumont, Sour Lake, and Kountze could not benefit from such interconnections at this time. China and Bevil Oaks could possibly be interconnected with the nearby Meeker system, although no investigation has been made as to the proximity of the Meeker water lines or the adequacy of its production facilities. Bevil Oaks is also adjacent to Northwest Forest, which has an existing 16" water connection to Beaumont. However, any interconnection between these two systems would require the consent of Beaumont because of the terms of the wholesale contract between Beaumont and Northwest Forest.

Lumberton could possibly be interconnected to the Beaumont system through the lines from the City's wells within Lumberton. However, Lumberton has three wells of its own and does not appear to be need of an interconnection at this time.

The possible need for interconnections and their feasibility should be reviewed carefully at the time of project implementation.

It will be a rare event that enough wells and/or surface water treatment units for any community will be out of service for any length of time simultaneously to create a severe water emergency. Only an extraordinary event such as a severe storm, riots, an act of war, a major fire (or chain of fires), or severe aquifer or surface water pollution would put any of the communities in a severe water emergency. In such an event, drinking water would be hauled in until the crisis passed (unless an interconnection has been arranged). All of the disasters above (other than aquifer or surface water pollution) would probably be managed by emergency management authorities rather than by the water purveyors.

2. Mild Conditions Measures

- a. Inform all customers that a low level emergency has been reached. In the case of a slowly developing crisis, notice could be through news media in conjunction with mailing. For a more imminent crisis, the news media should be used along with flyers passed out from door to door, although such flyer distribution may be difficult for some communities considering the broad territory involved. Flyers should contain a date and signature along with the message to make it plain that they represent current developments.

Some situations such as failure of a single piece of equipment could be handled by Authority personnel without notifying the public.

- b. Warn customers to start reducing water use; protect pipes against freezing; and/or store water for emergency use, as appropriate. [May apply in some cases only to outlying service areas, as cases of transmission line failure.]
- c. Recommend a voluntary lawn watering schedule, if appropriate.
- d. Look into possibility of alternate supply, including interconnection if appropriate.
- e. Make or arrange for repairs, if appropriate.
- f. Pursue action against stream pollution, if appropriate.
- g. Take steps toward increasing system capacity, if usage is nearing safe capacity.
- h. Keep customers updated as appropriate.

3. Moderate Conditions Measures#

- a. Notify customers of intermediate level emergency by appropriate means.
- b.* Impose mandatory lawn watering schedule, if appropriate (in dry weather conditions), under authority of sample ordinance (Exhibit 12).
- c.* Prohibit wasteful uses [certain uses, mainly outdoor, defined as "Water Waste" in ordinance (Exhibit 12)].
- d. In the event of contamination, notify customers so that they can seek bottled drinking water supply or be prepared to purify water from system if needed.
- e. Seek reduced usage from commercial users and outside entities if appropriate.
- f. Take steps toward obtaining alternate supply (including interconnection), if appropriate.
- g.* Impose surcharge system, if appropriate.
- h. Make or arrange for repairs, if appropriate.
- i. Pursue action against stream pollution, if appropriate.
- j. Take measures toward increasing system capacity, if appropriate.
- k. Keep customers updated as appropriate.

*See ordinance (Exhibit 12) for various procedures for businesses dependent on outdoor water usage.

#Some measures may apply only to outlying service areas for situations affecting only those areas, such as transmission line problems.

4. Severe Conditions Measures#

- a. Notify customers of emergency by appropriate means.
- b.* Prohibit all outdoor use and all wasteful use (as defined in Exhibit 12).
- c.* Impose surcharge system, if appropriate (if not already done).
- d.* Impose rationing, if appropriate.
- e. In the case of contamination, warn customers to use bottled water for drinking and cooking (or to purify water from system before use, if appropriate).

- f. Require commercial and industrial users to stop using public water for processes, for cooling, or for recreation.
- g. Place fire departments within community, as well as neighboring fire departments, on alert that pumper units may be needed, if appropriate.
- h. Make or arrange for repairs, if appropriate.
- i. Pursue action against stream pollution, if appropriate.
- j. Act as fast as possible toward expanding system capacity, providing additional treatment, and/or obtaining alternate supply, if appropriate.
- k. Keep customers updated as appropriate.

*See ordinance (Exhibit 12) for various procedures for businesses dependent on outdoor water usage.

#Some measures may apply only to outlying service areas for situations affecting only those areas.

INFORMATION AND EDUCATION

One or more of several measures should be taken to inform customers of crisis conditions and to keep them updated. These measures include:

1. Radio and television announcements. (Two television stations in Beaumont, one station in Port Arthur, various radio stations in Orange, Hardin and Jefferson Counties; also, consider possible emergency messages on cable stations.)
2. Press releases in Beaumont Enterprise, Hardin County News, and/or Kountze News.
3. Letters or flyers mailed to customers (alone or with monthly bills).
4. Letters or flyers hand delivered to customers in course of meter reading.
5. Letters or flyers hand delivered to customers in emergency.
6. Telephone calls in cases where emergency notice must be given at night, or when only a small neighborhood is involved.
7. Vehicles with loud speakers in emergencies when telephone service is out or when unusually fast notification is necessary.

Selection of notification methods depends on the nature and urgency of the crisis. The notifications would state the nature of the crisis, the actions requested of customers, and the anticipated duration (if known). *NOTE: If the crisis is related to contamination of the water*

supply, the Authority should follow any applicable public notice requirements of 30 TAC 337.3 (8), TNRCC water hygiene regulations.

Customers should be warned through brochures, well in advance of any emergency, what might be required during an emergency. See Exhibit 13 for one proposed brochure or flyer.

INITIATION PROCEDURES

1. **Responsibility for Monitoring.** The executive officer for each entity has overall responsibility for monitoring the performance of that entity's facilities. However, the necessary monitoring for trigger conditions may be delegated to a department head and/or key operating personnel for the Authority's water production and distribution system. The personnel will monitor the specified quantitative parameters for mild, moderate, and severe conditions. Monitoring frequency for each parameter will be consistent with the description of that parameter.

The personnel will also be on the alert for various nonquantitative trigger conditions. Many of these conditions will be noted in the course of normal operating duties.

Information as to whether these parameters are reached, or close to being reached, will be added to the appropriate monthly operating report. If a trigger condition requiring prompt action is noted, the assigned personnel will take immediate action and/or notify the executive officer and/or department head as appropriate.

2. **Authority for Action.** Except in catastrophes where actions are governed by emergency management authorities, actions should be taken by the executive officer, the department head, and/or the governing body as authorized in the sample Ordinance Controlling Water Usage in Emergencies. The Authority's Attorney should be notified in advance of any action by the governing body related to water conservation.

The responsibility for declaring a water supply emergency depends on the nature and urgency of the situation. For slowly developing situations, a resolution can be passed by the governing body at a regular meeting. As the urgency increases, action may occur at a special meeting, at an emergency meeting, by the executive officer, or by a designated subordinate acting on his own. In situations such as hurricanes or riots, action by emergency management authorities may be the overriding factor.

Each action listed in preceding sections is noted as to whether it should be implemented by the executive officer (*or authorized department head*) or by the governing body.

In Section III. B above, the various trigger conditions are classified with respect to who should declare the emergency, as follows:

- *Governing body (in regular, special, or emergency meeting as appropriate).
- **Governing body if appropriate under circumstances. Executive officer should first look at the situation and decide whether to initiate the action on his own or to call for a special meeting of the governing body for that purpose.
- ***Executive officer (or designated subordinate) on his own.

Even though the executive officer has declared an emergency without prior approval of the governing body, certain actions dealing with the crisis must be taken by the governing body. These actions include restricting or prohibiting outdoor water use; imposing surcharge or rationing plans; and taking legal action against activities which could reduce or contaminate the Authority's water supply.

3. Procedures for Implementation. (See also Exhibit 14)

- a. Isolation of defective pressure reducing valves: Operating staff closes appropriate gate valves, procures replacement materials, and makes necessary repairs.
- b. Repair of lines or equipment: Operating staff perform minor repairs or equipment replacement; operating staff and/or supervisors arrange for minor contract repairs; executive officer, department head, and/or governing body arrange for major repairs as appropriate. Executive officer acts on his own, or obtains authority from governing body according to magnitude of repairs.
- c. Obtaining alternate supply: Executive officer reports to governing body that alternate supply may be needed on a long-term or emergency basis. In an emergency, contact with neighboring water systems is made by executive officer or designated subordinate. For long term alternate supply, governing body considers appropriate action.
- d. Expanding system capacity or providing additional treatment: Executive officer initiates action on his own or at recommendation of subordinates, consisting of discussion with governing body and/or consultants.
- e. Action against stream polluters: Executive officer discusses matter with Authority's Attorney (*possibly on recommendation of department head*) and brings matter before governing body if appropriate.
- f. Placing fire departments on alert: Executive officer or designated subordinate notifies appropriate personnel of local and neighboring fire departments.
- g. Notices to customers, including updates: Water department personnel give notice in case of localized situations; executive officer or designated subordinate arranges for notices, including selection of method, for widespread situations.

- h. Requests for voluntary lawn watering schedule or reduced industrial/commercial usage: Executive officer or designated subordinate sends out public notice by appropriate means, or arranges to have businesses and industries contacted by letter or telephone.
 - i. Curtailment of specified commercial and industrial use: Executive officer issues written notice; may arrange for verbal notice before written notice.
 - j. Restrictions/curtailment of outdoor water usage/wasteful use, surcharges, rationing: Resolution by governing body. Authority's attorney will be notified in advance.
4. Advance Planning. The Authority should prepare a list of all radio stations, television stations, and newspapers which may be called on to assist in public notification. Each station or newspaper should be contacted in advance regarding the possible need for emergency assistance of this nature. For each station or newspaper, one or more contact persons should be designated, together with telephone numbers for 24 hours use if possible.

Lists of potential repair contractors for vital system components should be maintained. Lists of agencies such as neighboring water departments, neighboring fire departments, police and sheriff departments, and many offices performing emergency management functions should also be kept ready for emergency use.

Although many potential crisis situations cannot be foreseen, the Authority should prepare lists of those situations most likely to occur. At least a rough draft of flyers, letters, press releases, and broadcast messages should be prepared for the most probable situations.

Each community should investigate the feasibility of emergency interconnections with neighboring systems. Factors to be considered include distance between systems, production and storage capacity in each system, and line sizes and pressures in the portions of each system near the interface.

The terms of any interconnection agreement, as well as the interconnection facilities, would have to assure protection for both water systems.

In an extreme situation requiring water to be hauled in for the Authority's sole supply, severe rationing would be needed. Water would in that event be distributed in bottled form. Many industrial or commercial users would be forced to curtail water usage or to obtain alternative supplies if available.

TERMINATION NOTIFICATION

Action by the governing body is mandatory to rescind specific actions taken by the body to deal with a crisis, such as restricting or prohibiting outdoor water use; imposing surcharges; or imposing rationing.

Action by the body is normally needed to downgrade or terminate an emergency if the body (1)

declared the emergency and/or (2) took specific action to deal with the emergency.

EXCEPTION: Cases where the governing body set a specific time limit for the crisis or authorized a Authority official to end the crisis at his discretion.

The executive officer (or his designated subordinate) can announce the end of the crisis if no action by the governing body was involved. The same official should also take any appropriate action in connection with the termination.

Once the termination decision has been made, notification should be prompt. If customers are kept under a crisis notice unnecessarily, they will tend to relax vigilance and will also tend to disregard future notices.

Notification procedures and methods should be similar to those for the onset of a crisis. The governing body and/or the executive officer should use discretion in selecting the appropriate procedure(s).

IMPLEMENTATION

1. **Ordinance.** The basis for any necessary changes in rate structures, including setting up a mechanism for a future increasing block rate, will be by a sample ordinance (Exhibit 6). The basis for emergency surcharges and rationing will be by a sample ordinance (Exhibit 12).
2. **Changes in Plumbing Codes.** Exhibit 9 consists of a sample supplementary plumbing ordinance, requiring certain water conserving measures in home plumbing including optional measures in the Standard Plumbing Code. This ordinance refers to Senate Bill 587, passed in 1991, which imposes certain water conservation measures statewide. The sample ordinance is based on the community having already adopted the Standard Plumbing Code, but without the optional water conserving provisions. If necessary, the ordinance can be modified in various ways such as adoption of the Standard Plumbing Code for the first time or reference to another plumbing code which the community has already adopted.
3. The Authority will, if necessary in the future, approach the appropriate officials in neighboring areas regarding the possibility of establishing emergency interconnections. If the interconnections should be constructed, the Authority will if necessary contact the officials in regard to opening such interconnections. Procedures to be established in advance by contract will be followed in such cases.
4. The Authority must adopt specific resolutions at the beginning and ending of emergencies to initiate/terminate restrictions on lawn watering, prohibition of lawn watering, surcharge rates, and/or rationing. In an extreme emergency, these resolutions can be passed by simple motion and still be valid.

5. The Authority's attorney will be notified prior to any action of the governing body related to conservation in order to review or recommend proposed action as appropriate.
6. Any future contracts to provide water and/or wastewater service to wholesale entities (such as water districts and water supply corporations) will contain provisions making those entities subject to provisions of the Authority's Emergency Demand Management Plan. (This may possibly apply to communities served by the regional water plants in the project in lieu of individual water conservation programs for these entities.) Existing contracts will be amended if required by the TWDB. *(This will not apply to contracts for emergency service only.)*

ADOPTION OF PROGRAM

As stated earlier, the program is not designed for adoption at this time. Rather, it will serve as a generic program from which one or actual programs can be derived at the time that the project is implemented in the future. Adoption of one or more programs will be required only in the event of TWDB funding for all or part of the project, and then only for loans exceeding \$500,000. Adopted programs are expected to be required on the part of one or more of the following entities, depending on which entity(ies) are designated to implement the project and/or will receive service from the project:

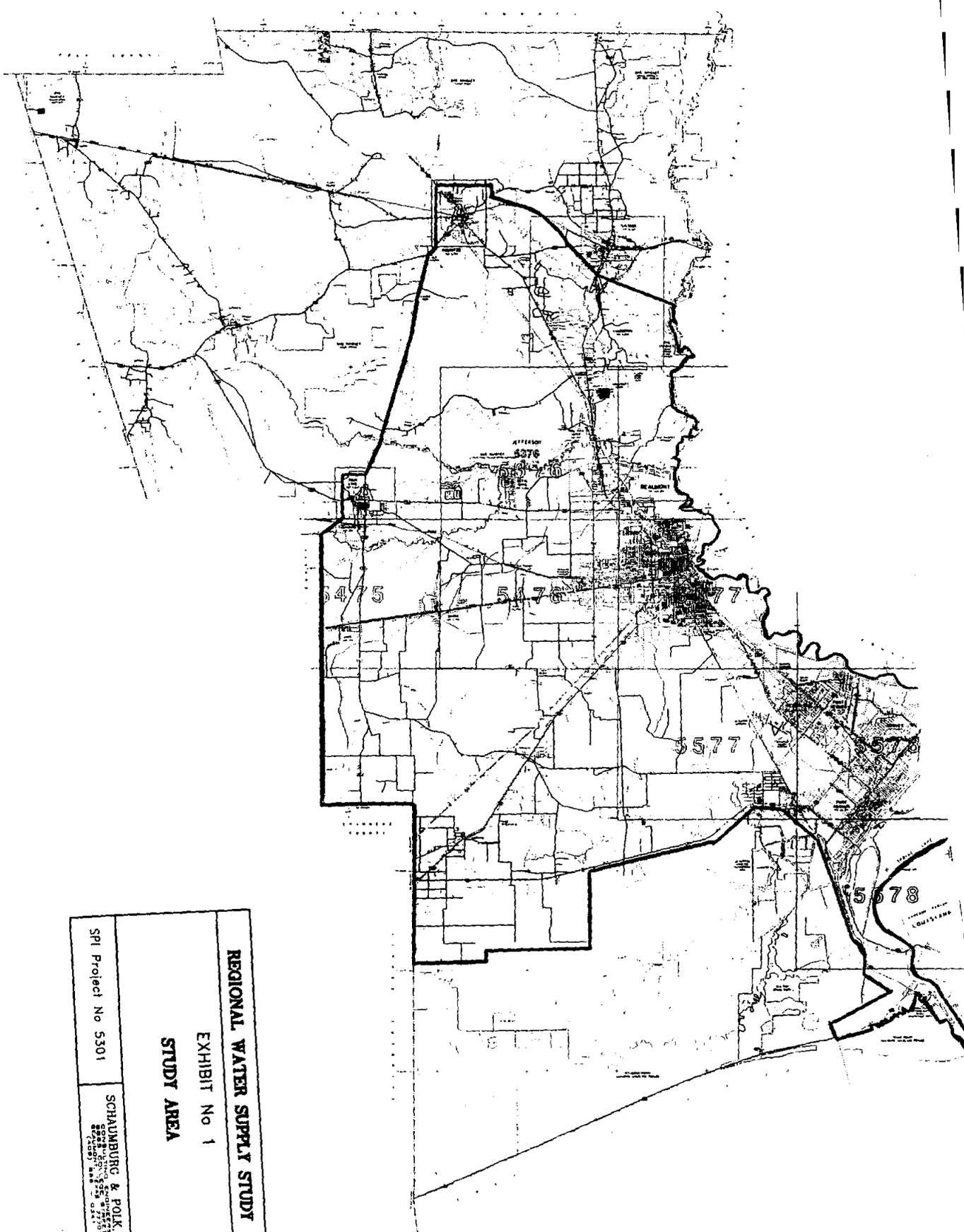
- a. Lower Neches Valley Authority
- b. City of China
- c. Bevil Oaks Municipal Utility District
- d. City of Sour Lake
- e. City of Kountze
- f. Any special authority(ies) which may be established to own and operate one or of the water plants and/or intake or transmission facilities.
- g. Any other cities or water districts which may elect to participate in the project when the time comes.

The City of Beaumont and the Lumberton Municipal Utility District have already implemented programs which were developed several years ago in connection with SRF sewer projects. These entities may possibly be required to modify their programs if required by the TWDB to meet any new requirements not contained in the existing programs. However, it should be noted that both of these programs already contain provisions which would make them approvable for purposes of water loans as well as sewer loans. Specifically, each program contains the following provision at the end of Section III of the text:

Any future contracts to provide water and/or wastewater service to wholesale entities (such as water districts or water supply corporations) will make those entities subject to provisions of the City's [District's] Drought Contingency Plan. Existing contracts will be amended if [as] required by the Texas Water Development Board.

See following sample ordinances and resolutions which a typical city may use for program adoption. These documents may be readily adapted for water districts, for the LNVA, and/or for special authorities. Also, each entity may revise various portions of the ordinances/resolutions to fit its own circumstances and preferences.

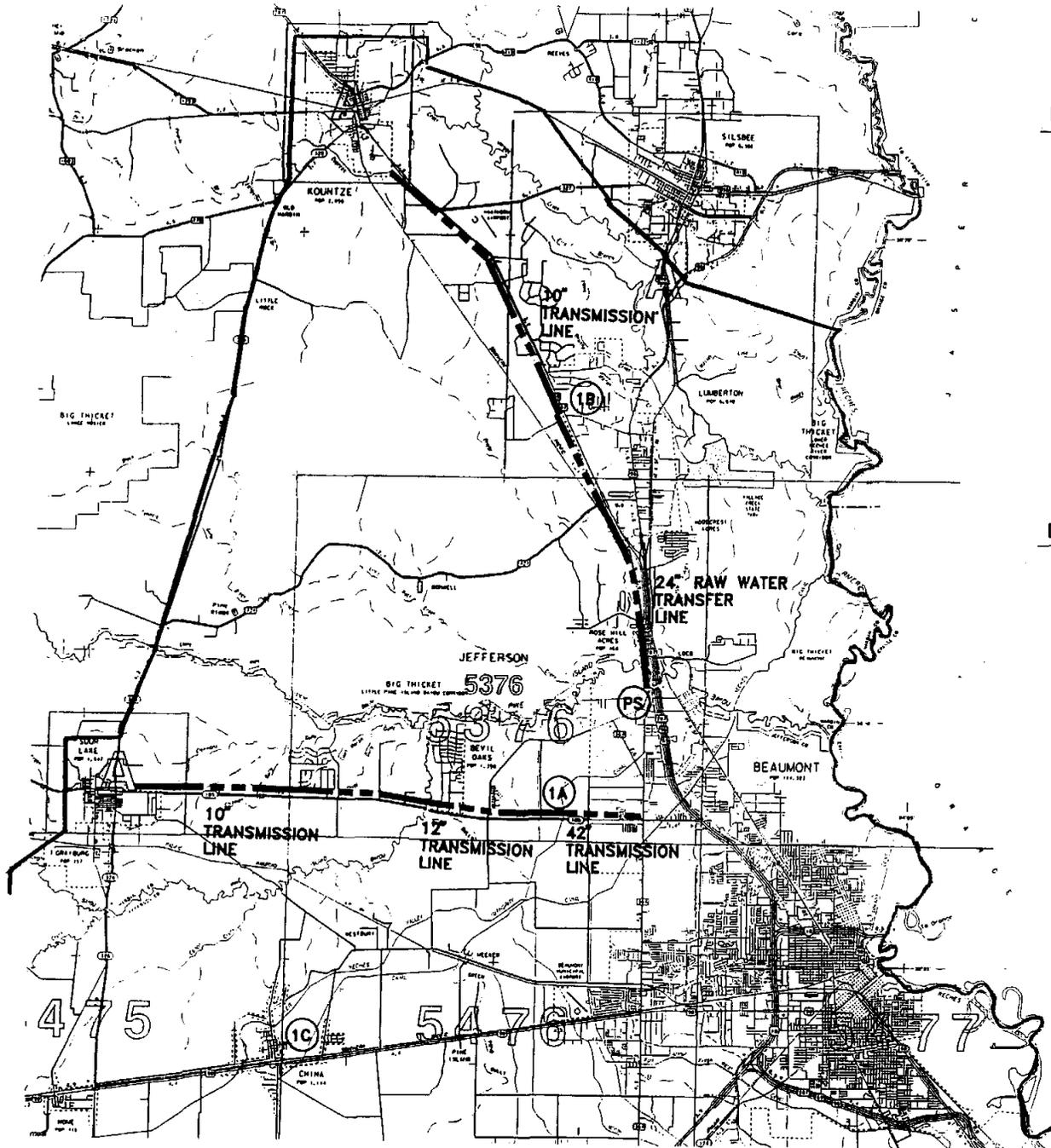
1. Ordinance Adopting Water Conservation Program, Including Emergency Demand Management Plan (Exhibit 15).
2. Water Rate System Ordinance (Exhibit 6).
3. Water Rate Ordinance (Exhibit 7).
4. Supplementary Plumbing Ordinance (Exhibit 9).
5. Resolution for Annual Reporting (Exhibit 10).
6. Ordinance Controlling Water Usage in Emergencies (Exhibit 12).
7. Resolution for Information/Education Program (Exhibit 16).
8. Resolution for Monitoring for Trigger Conditions (Exhibit 17).



REGIONAL WATER SUPPLY STUDY
EXHIBIT No 1
STUDY AREA

SPI Project No 5301

SCHAUMBURG & POLK, INC.
ENGINEERS AND ARCHITECTS
2000 N. 10th St., Suite 100
Tulsa, Oklahoma 74103
Phone: 918.438.1234
Fax: 918.438.1235



DESCRIPTION OF PROPOSED TREATMENT PLANTS

- (1A) **REGIONAL PLANT NO. 1**
23.13 MILLION GALLON PER DAY TREATMENT PLANT AND PUMPING FACILITIES TO SERVICE BEAUMONT, BEVIL OAKS, AND SOUR LAKE.
- (1B) **REGIONAL PLANT NO. 2**
9.42 MILLION GALLON PER DAY TREATMENT PLANT AND PUMPING FACILITIES TO SERVICE KOUNTZE AND LUMBERTON.
- (1C) **REGIONAL PLANT NO. 3**
0.51 MILLION GALLON PER DAY TREATMENT PLANT AND PUMPING FACILITIES TO SERVICE CHINA.

DESCRIPTION OF PROPOSED PUMPING FACILITIES

- (PS) 9.42 MILLION GALLON PER DAY RAW WATER PUMPING FACILITY TO SERVICE KOUNTZE AND LUMBERTON

REGIONAL WATER SUPPLY STUDY	
EXHIBIT No 2	
SELECTED PLAN	
SPI Project No 5301	SCHAUMBURG & POLK, INC <small>ENGINEERS, ARCHITECTS, PLANNERS</small> <small>14055 AAA 0527</small>

EXHIBIT 3

UTILITY EVALUATION DATA

(pages 35-42 from TWDB Guidelines)

5. Population served by water utility for previous five years:

6. Projected population for service area:

<u>Year</u>	<u>Population</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

<u>Year</u>	<u>Population</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Indicate source(s), dates, and/or method for the calculation of current and projected population:

B. Active Connections

1. Current number of active water meter connections by user type. Check whether multi-family service with a single meter is counted as Residential _____ or Commercial _____.

<u>Treated water users:</u>	<u>Metered</u>	<u>Not metered</u>	<u>Total</u>
Residential	_____	_____	_____
Commercial	_____	_____	_____
Industrial	_____	_____	_____
Public	_____	_____	_____
Other	_____	_____	_____

2. Net number of new connections per year for previous five years:

<u>Type</u>	19 _____	19 _____	19 _____	19 _____	19 _____
Residential	_____	_____	_____	_____	_____
Commercial	_____	_____	_____	_____	_____
Industrial	_____	_____	_____	_____	_____
Public	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

II. WATER USE DATA FOR SERVICE AREA

A. Water Production and Sales

1. Total amount of water diverted and/or pumped for previous five years from all sources (in 1000 gallons):

	19 ____	19 ____	19 ____	19 ____	19 ____
January	_____	_____	_____	_____	_____
February	_____	_____	_____	_____	_____
March	_____	_____	_____	_____	_____
April	_____	_____	_____	_____	_____
May	_____	_____	_____	_____	_____
June	_____	_____	_____	_____	_____
July	_____	_____	_____	_____	_____
August	_____	_____	_____	_____	_____
September	_____	_____	_____	_____	_____
October	_____	_____	_____	_____	_____
November	_____	_____	_____	_____	_____
December	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____

2. Please indicate how the above figures were determined (for example, from a master meter located at the point of diversion from a stream or located at a point(s) where raw water enters the plant, or from water use sales).

3. Amount of water delivered and/or sold as recorded by individual meter sales records (in 1000 gallons).¹ Again, check whether multi-family service with a single meter is counted as Residential _____ or Commercial _____.

Year	Total	Residential	Commercial	Industrial	Public	Other
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

B. High Volume Customers: Give two-year average annual use.

1. Give two year average annual use for your ten highest volume retail customers in your service area that you serve directly.

	<u>Customer</u>	<u>(1,000) gals/year</u>	<u>Type of Customer</u>
(1)	_____	_____	_____
(2)	_____	_____	_____
(3)	_____	_____	_____
(4)	_____	_____	_____
(5)	_____	_____	_____
(6)	_____	_____	_____
(7)	_____	_____	_____
(8)	_____	_____	_____
(9)	_____	_____	_____
(10)	_____	_____	_____

2. Attach a list of your wholesale customers and indicate whether water sales are included in II.A.1. above.

C. Water Accounting Data

1. Unaccounted-for Water²:

2. Peak daily use to average daily use ratio³:

<u>Year</u>	<u>Unaccounted-for Percent</u>	<u>Year</u>	<u>Average Daily Annual Use (MGD)</u>	<u>Peak Day (MGD)</u>	<u>Date Peak Occurred</u>	<u>Ratio</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

3. Per capita water use for previous five years (in gallons per capita per day, or gpcd).⁴

<u>Year</u>	<u>Population</u>	<u>Residential Use (1,000 gallons)</u>	<u>Residential gpcd</u>	<u>Total Municipal Use (1,000 gallons)</u>	<u>Municipal gpcd</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
5-year average	_____	_____	_____	_____	_____

4. Seasonal water use:

Year	Average Daily Winter Use (Dec. - Feb. in MGD)	Average Daily Summer Use (Jun - Aug. in MGD)	Average Daily Annual Use (12 months in MGD)	For Office Use
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

5. Monthly Water Sales by User Category for the Last Full Calendar Year, based on customer meters (in 1,000 gallons)

	Residential	Commercial- Institutional	Industrial	Public	Total
January	_____	_____	_____	_____	_____
February	_____	_____	_____	_____	_____
March	_____	_____	_____	_____	_____
April	_____	_____	_____	_____	_____
May	_____	_____	_____	_____	_____
June	_____	_____	_____	_____	_____
July	_____	_____	_____	_____	_____
August	_____	_____	_____	_____	_____
September	_____	_____	_____	_____	_____
October	_____	_____	_____	_____	_____
November	_____	_____	_____	_____	_____
December	_____	_____	_____	_____	_____

D. Projected Water Demands: Provide estimates for total water demands for the planning horizon of the utility. Indicate sources of data and how projected water demands were determined. Attach additional sheet if needed.

III. WATER SUPPLY SYSTEM

A. Water Supply Sources: Identify all current water supply sources and the amount available.

<u>Source</u>	<u>Amount Available</u>
Surface water: _____	_____
Groundwater: _____	_____
Contracts: _____	_____
Other: _____	_____

B. Treatment and Distribution System

1. Design capacity of system: _____ MGD
2. If surface water, do you recycle filter backwash to the head of the plant? Yes _____ No _____
3. Please describe your water system. Include the number of treatment plants, wells and storage tanks. If possible, include a sketch of the system layout.

IV. WASTEWATER UTILITY SYSTEM

A. Wastewater System Data

1. Design capacity of wastewater treatment plant(s): _____ MGD
2. Is treated effluent used for irrigation on-site _____, off-site _____, plant washdown _____, or chlorination/dechlorination _____?
3. Briefly describe the wastewater system(s) of the area serviced by the water utility. Describe how treated wastewater is disposed. Where relevant, identify treatment plant(s) with the TNRCC name and number, the operator, owner, and, if wastewater is discharged, the receiving stream. Please provide a sketch or map which locates the plant(s) and discharge points or disposal sites.

B. Wastewater Data for Service Area

1. Percent of water service area served by wastewater utility system: _____ %
2. Monthly volume treated for previous five years (in 1,000 gallons):

	19 _____	19 _____	19 _____	19 _____	19 _____
January	_____	_____	_____	_____	_____
February	_____	_____	_____	_____	_____
March	_____	_____	_____	_____	_____
April	_____	_____	_____	_____	_____
May	_____	_____	_____	_____	_____
June	_____	_____	_____	_____	_____

July	_____	_____	_____	_____	_____
August	_____	_____	_____	_____	_____
September	_____	_____	_____	_____	_____
October	_____	_____	_____	_____	_____
November	_____	_____	_____	_____	_____
December	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____

V. UTILITY OPERATING DATA

- A. **Water and Wastewater Rates and Rate Structure** (Indicate if there are different rate structures for industrial users).
- B. **Other Relevant Data:** Please indicate other data or information which are relevant to both the applicant's water management operations and design of a water conservation plan.

VI. CONSERVATION GOALS

PLEASE USE THE WATER CONSERVATION PLANNING DATA YOU HAVE PROVIDED IN THIS SURVEY TO ESTABLISH CONSERVATION GOALS.

- A. **Water Conservation goals for municipal utilities** are generally established to maintain or reduce consumption as measured in:
 - 1) gallons per capita per day use,
 - 2) unaccounted-for water losses,
 - 3) the peak day to average day ratio, and/or
 - 4) an increase in reuse or recycling of water.
- B. **Conservation review staff** assess the reasonableness of water conservation goals based on whether the applicant addresses the following steps:
 - 1) identification of a water or wastewater problem,
 - 2) performance of a system audit (completion of a planning data form),
 - 3) selection of goals based on the potential to save water as identified in the audit, and
 - 4) performance of a benefit-cost analysis of conservation strategies.

If at least the first three steps in the water conservation plan have been completed and are summarized, then staff can conclude that there is a substantiated basis for the goals and that the water conservation plan is integrated into water management. Therefore the established conservation goals are reasonable. Please contact Board for most current version of this form before submission.

FOOTNOTES

1. Include under "Public" any water not billed that was metered and delivered, such as parks department use. Industrial sales should include only manufacturing and other heavy industry. Commercial should include all retail businesses, offices, hospitals, etc. Please indicate whether multi-family housing sales are reported under Residential or Commercial. If reported under Commercial, please estimate that residential-type consumption is _____ percent of the "Commercial" sales.
2. Unaccounted-for water is the difference between water diverted or pumped (as reported in Section II.A.1. above) and water delivered land/or sold (as reported in Section II.A.3.). Express in 1,000 gallons and as a percentage of water diverted.
3. Peak day to average day ratio is calculated as the maximum daily use (in million gallons per day) divided by the average daily annual use. Average daily annual use is the total pumpage for the year (as reported in Section II.A.1.) divided by 365 and expressed in million gallons per day.
4. Calculate residential per capita use by dividing residential sales (as reported in II.A.3. above) by the population. Calculate Municipal per capita use by subtracting the industrial sales from the total water diverted(as reported in II.A.1.), and divide by the population. The TNRCC and TWDB consider the Municipal Per Capita Use as the most representative figure to use in long-range water supply and conservation planning.
5. Seasonal water use. Average daily winter use = total use for Dec., Jan., and Feb., divided by 90. Average daily summer use = total use for Jun., Jul., and Aug., divided by 92. Average daily annual use = total annual use divided by 365. Use data from II.A.1. above.

EXHIBIT 4

PROPOSED FLYERS

(To be Distributed to Customers at Beginning of Program)

UE AROUND THE HOUSE...

ways to conserve water are listed look for different places in the home in be used more efficiently.

ine: The washing machine uses 14% sed inside the home. When using an hing machine (32 to 59 gallons are cle), adjust the water level to match load. If the machine does not have a siment, wash only full loads. When w machine, consider a water-saving ould be no more expensive than a odel and which can reduce water use 30%.



Adjust the water level on the washing machine to match the size of the load

nsulate hot water pipes where possi- g delays (and wasted water) while water to "run hot." Pipe insulation is y to install, and available at plumbing ores.

ter: Be sure the hot water heater ot set too high. Very hot settings aste energy since the water has to be water before use. However, if the omatic dishwasher, a water temper- 140° F is required so that the dish- n effectively.

ID FIX ALL LEAKS

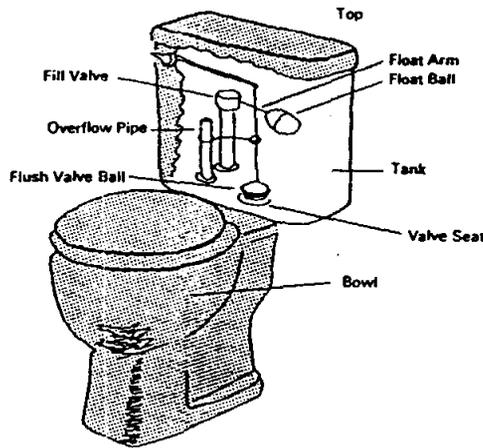
ccount for 10% or more of the water h water and energy if the source is a

For example, a toilet with a silent of water a minute (a mere dribble) 30 gallons of water a month.

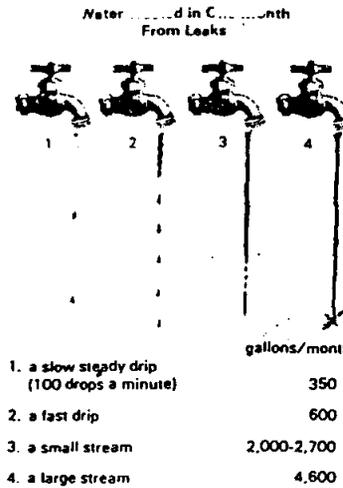
Leak: When a toilet leaks, water escapes from the tank into the bowl. To determine if the toilet is leaking, look first at the toilet bowl after the tank has stopped filling. If water is still running into the bowl or if water can be heard running, the toilet is leaking.

Although water may not be seen or heard running, the toilet may have a "silent leak." To test for a silent leak, mix a few drops of food coloring or place a dye capsule or tablet (available from many utilities and hardware stores) into the water in the toilet tank. DO NOT flush the toilet. Wait for about 10 minutes, and if the dye or food coloring appears in the toilet bowl, the toilet has a silent leak.

The most common causes of toilet leaks are worn flush valve balls, improperly adjusted water levels, worn valve seats, and leaking fill valves. Check each item, replace worn parts as necessary, and retest to make sure the leak has been fixed.

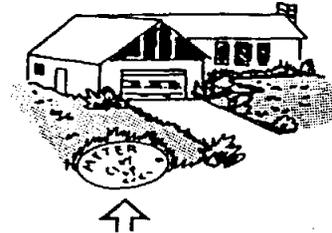


Faucet Leaks: Faucet leaks are usually obvious. However, seldom used taps in the basement or storage rooms should be periodically checked. Faucet leaks are usually caused by worn washers or "O" rings (for a washerless faucet) which can be replaced with two or three hand tools. Replacement washers and "O" rings are inexpensive and can be purchased from most hardware and variety stores.



Use The Water Meter To Check For Other Leaks:

The water meter can be used to check for invisible or unnoticed leaks. Turn off all water outlets and water using appliances. Read the dial on the water meter and record the reading. After 15 to 20 minutes, recheck the meter. If no water has been turned on or used and the reading has changed, a leak is occurring somewhere in the plumbing system. The services of a plumber or trained water utility employee is often required to locate and fix these invisible leaks.

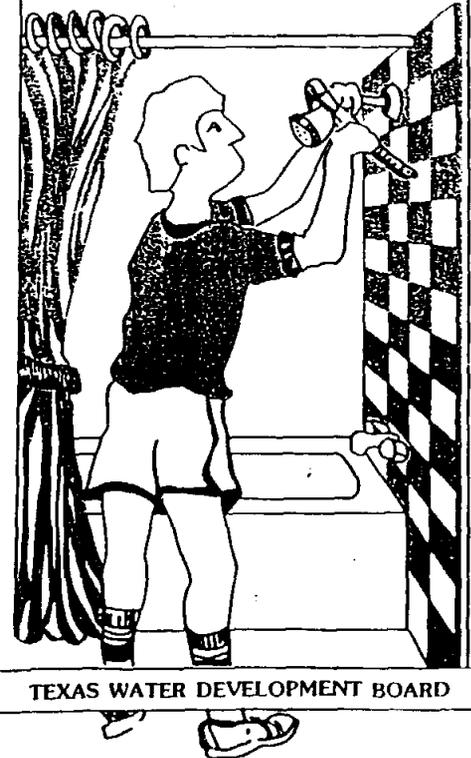


The water meter is often located in the front yard near the street

A copy of this brochure or the companion brochure, "How To Save Water Outside The Home," may be obtained by writing to:

CONSERVATION
Texas Water Development Board
P.O. Box 13231, Capitol Station
Austin, Texas 78711-3231

How To Save Water Inside The Home



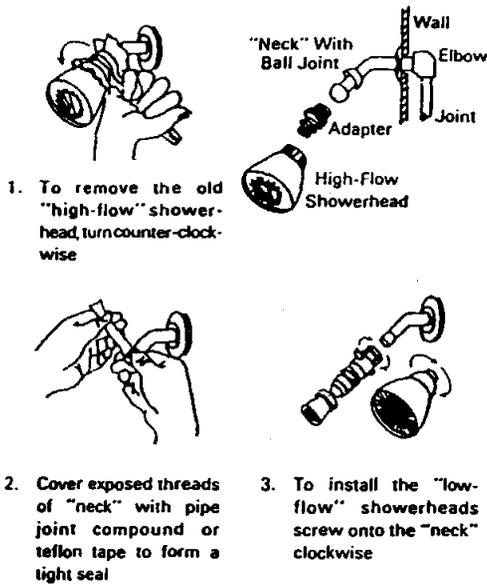
TEXAS WATER DEVELOPMENT BOARD

turn on the tap, they expect an inexpensive water. However, the cost of water supplies and treating wastewater is increasing. Texans now spend over one billion dollars each year on new or expanded wastewater treatment facilities just to keep up with growth and replace worn out systems. To minimize future water problems, water supplies will have to meet future demands in some way. To minimize future water problems, water supplies will have to meet future demands in some way. To minimize future water problems, water supplies will have to meet future demands in some way.

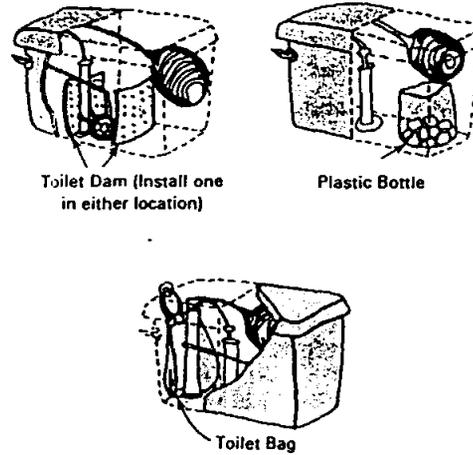
About 75 percent of the water used inside the home is used in the bathroom. Be aware of the amount of water being used, and look for ways to use less whenever possible.

Bathing: Taking a shower instead of a bath will usually save water, and a short shower will use less water than a long one. Additionally, installing a low-flow showerhead will save about one-half the water currently being used in the shower, while still providing a refreshing, cleansing shower. Installing a low-flow showerhead is the single most effective conservation step that can be taken inside the home.

HOW TO CHANGE SHOWERHEADS



Toilet: Standard toilets manufactured prior to the 1980s usually use 5 to 7 gallons per flush. In these older toilets, water can be conserved by using either a toilet dam, plastic bottle, or plastic bag to displace water in the tank. Installing a "displacement device" is the second most effective conservation step that can be taken inside the home, and up to 20% of the



water that is currently used can be saved. Replacing the existing toilet with one using 3.5 gallons or less per flush would save even more water and money. Displacement devices usually do not work as well in newer toilets that use 3.5 gallons or less per flush. However, regardless of the type of toilet, make sure it is using the least amount of water possible, do not use the toilet as a trash can for paper and facial tissues, and make sure the flush and fill components in the tank work properly.

*Do not use a brick—it can crumble and damage the fixture.

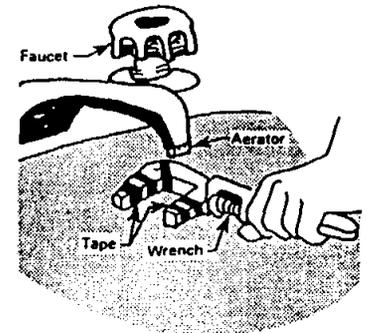
Lavatory: By simply changing toothbrushing habits, a considerable amount of water can be saved. Instead of allowing the tap water to run while brushing, run the tap just to rinse the toothbrush. The same method



Turn off water while brushing teeth and use a cup for mouth rinsing

can be used to conserve additional water when shaving and washing hands. Additionally, installing a low-flow faucet aerator can save up to one-half of the water currently being used in the lavatory.

HOW TO INSTALL A FAUCET AERATOR



HOW TO ADVANCE TO THE KITCHEN...

About 8 percent of in-home water use takes place in the kitchen. Keep water conservation in mind, and think of ways that water can be saved in the kitchen.

Sink: Run water from the faucet only when necessary.

- Fill the basin or a dish pan to rinse dishes instead of using running water.
- Soak pots and pans before washing.
- Fill the basin or a pan or bowl with water to wash fruit and vegetables.
- Instead of letting hot water run over frozen foods, place them in a pan of hot water to thaw.
- Keep a pitcher of water in the refrigerator rather than running tap water for a cool drink.
- Operate the garbage disposal only when necessary.

Dishwasher: Wash only full loads in the dishwasher. When buying a new machine, consider purchasing a water saving model. Newer models can cut water use by 25 percent and are no more expensive than non-conserving models.

WATER USE IN A TYPICAL COMMUNITY

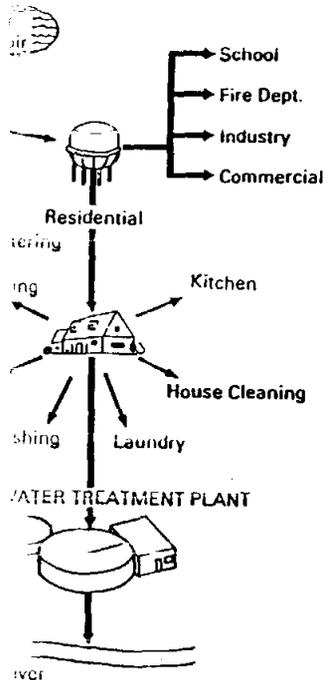


EXHIBIT 5

PRESS RELEASE

To be Submitted to Local Newspaper in
Article Form at Beginning of Program and
Also Distributed to Customers with Flyers

PRESS RELEASE

XXXXXXXXXX - A generalized water conservation program covering the Lower Neches Valley Authority (along with various communities to receive water service from the LNVA) was developed in a planning grant from the Texas Water Development Board. An individual program was subsequently adopted by the City of XXXXXXXXXXXX in connection with a loan from the TWDB for construction of a new water treatment plant and related transportation facilities.

This requirement was imposed by the state legislature in 1985 for governmental bodies seeking loan funds from or through the Texas Water Development Board. The City has received a loan commitment of \$ _____ to finance the wastewater project.

The two major divisions of the program are a water conservation plan and an emergency demand management plan. The water conservation plan will initially contain various measures designed to minimize waste and leakage. Water conservation measures will be required in all new plumbing. (Please note that some water conserving features are already required by 1991 legislation.) In addition, the City will promote water conservation by distributing information to customers and by installing individual meters in complexes if needed.

Emergency demand management measures will minimize hardship in the event of surface water contamination, extended power failure, pump failure, storm damage, severe freeze, and other emergencies. These measures include emergency repairs; restrictions on outdoor or industrial water use; temporary surcharges; and rationing in extreme cases.

Existing water rates must be restructured somewhat to eliminate discounts for large volumes of use. In the event that the existing surface water supply becomes threatened in the future, water rates may be restructured further. The restructured rates would tend to discourage excessive use, but would not prevent necessary consumption by various classes of users.

Although there is no actual shortage of surface water for Southeast Texas, all portions of the state are subject to conservation requirements as result of 1985 legislation. Any community seeking a new loan of over \$500,000 from state loan funds is required to establish a program for general water conservation and emergency procedures according to state regulations. In this case, both the LNVA and the City of XXXXXXXXXXXX are adopting water conservation programs to meet TWDB requirements. Because of local climate and adequate ground water supply, the program for XXXXXXXX will be much less rigorous than for arid portions of the state.

EXHIBIT 6

**PROPOSED ORDINANCE FOR ESTABLISHING
WATER RATE SYSTEM FOR DEBT SERVICES AND
OPERATION AND MAINTENANCE OF PUBLICLY
OWNED WATER WORKS**

ORDINANCE
ESTABLISHING WATER RATE SYSTEM
FOR DEBT SERVICE AND
OPERATION AND MAINTENANCE OF PUBLICLY OWNED WATER WORKS

FOR

CITY OF XXXXXXXXX
XXXXXX COUNTY, TEXAS

WHEREAS, the City of XXXXXX have in the past fixed rates for water service by simple ordinance or resolution whenever it became necessary to adjust the rates; and

WHEREAS, the City of XXXXXX desires a loan commitment from the Texas Water Development Board to provide funding for participation in new regional water treatment and transportation facilities; and

WHEREAS, state regulations require the City to establish a WATER RATE SYSTEM meeting certain requirements before such loan commitments can be implemented;

NOW, THEREFORE LET IT BE ORDAINED by the City Council of the City of XXXXXX:

SECTION I
DEFINITIONS

- (a) Block Rate. The unit price per 1000 gallons for any specified range of monthly water usage.
- (b) City. The City of XXXXXX, XXXXXXXX County, Texas or any authorized person acting in its behalf.
- (c) City Manager. The chief executive officer of the City.
- (d) Current Capital Improvements. Those capital improvements to the City's water system which are financed through current operating revenues.
- (e) Debt Service. Periodic payments of principal and/or interest on indebtedness incurred for the purpose of purchasing, constructing, improving, or rehabilitating the City's water production, treatment, storage, and distribution system, including necessary land or easement purchases, and including participating in regional facilities for similar purposes.

- (f) Operation and Maintenance. The actual cost of operating and maintaining the City water system, including a reasonable allowance for periodic replacement of major system components needed during the life of the system. Also included are necessary administrative costs allocable to the water system and any costs for purchasing treated or untreated water from outside the system, as well as similar costs related to regional water facilities.
- (g) User (or Customer). Each residential, commercial, governmental, school, or industrial customer who is supplied water directly through the City water system. This definition excludes fire departments taking water through hydrants for fire fighting, fire drills, or related purposes. Also excluded are any neighboring communities or other water systems who may be supplied with water temporarily through interconnections between water systems, or customers of such systems.

A user may be located either within or outside the City.

- (h) User Class. A class of residential or nonresidential users with similar fundamental characteristics governing their rate or consumption.
- (i) Wholesale User (or Customer). Any city, water district, water supply corporation, or other entity which purchases water from the City on a regular or emergency basis for the purpose of distribution and resale to individual customers located outside the City.

SECTION 2 OBJECTIVES

1. Water rates, in combination with other water related income such as tap fees, shall be sufficient to pay for all operation and maintenance, current capital improvements, and debt service attributable to the water system, except as provided otherwise by ad valorem taxes, grants, or other revenue sources.
2. Fixed expenses not attributable to volume of usage may be recovered through a fixed minimum charge which covers not more than the first _____ gallons per month for each user.
3. Water rates for any user class shall be designed to discourage excessive usage. Monthly volumes of usage for any user may be grouped in blocks so that the unit price increases with the volume of usage. Except as noted in Item 2 above, the unit price shall never decrease with increased volumes of usage.
4. The legitimate needs of each user class shall be considered in establishing usage blocks so that no user will be penalized unfairly for using the amount of water he needs to carry on his operations.
5. Appropriate classes of users such as senior citizens may be provided with a reasonable amount of rate relief.

6. Charges for water shall be distributed as equitably as possible among user classes consistent with the objectives above.
7. No user shall be allowed to circumvent the intent of this ordinance by using water from several meters on the same premises.

SECTION 3
USER CLASSES

The City may, by separate ordinance, group all users into classes with similar water usage characteristics. Such classes shall include residential, various types of commercial, government, school, and various types of industrial classes. Each class may also be grouped into subclasses according to meter size.

The City Manager shall assign each existing user to the appropriate class and/or subclass and shall notify all users in writing. Each new user shall also be assigned to the appropriate class and/or subclass. All users shall be notified of the right to appeal their classification to the City Council.

User classes and/or subclasses may be altered by subsequent ordinance as appropriate.

SECTION 4
BLOCK RATES

For each user class or subclass, the City may by separate ordinance establish two or more blocks representing monthly volume of usage, with corresponding water rates as follows:

<u>Block</u>	<u>Block Rate</u>
0 through B_1	b_1 = Minimum bill divided by B_1
B_1 through B_2	b_2
B_2 through B_3	b_3
B_{n-1} through B_n	b_n

where B_1 through B_3 = upper limits of first three blocks in 1000 gallons (B_1 not to exceed 2.0).

B_n = upper limit of nth block in 1000 gal.

b_1 through b_3 = block rates for first three blocks.

b_n = block rate for nth block.

Each block rate shall be larger than the preceding block rate so that the unit price increases by volume (except that the minimum bill, B_1 , may be set high enough to recover fixed expenses plus the gallonage rate included in the minimum bill). The gallonage rate shall remain the same or increase in each succeeding block rate.

SECTION 5
ESTABLISHMENT OF USER CHARGES

The City shall, by separate ordinance to be enacted on a yearly basis, establish the terms B₁, B₂, B₃, B_n, b₁, b₂, b₃, b_n, etc., for each user class and/or subclass. These terms shall be designed so as to generate sufficient revenue for all operation and maintenance, current capital improvements, and debt service for the City water system (except as provided from other sources). These terms shall also be designed to be equitable for the various user classes, but may allow for differing needs of different classes.

For any users located outside the City, the City may increase water rates by a uniform percentage as may be justified to cover the entire cost of service to those users, considering any costs for service to those users in excess of costs for similar service within the City.

The City may reduce or waive the minimum bill for senior citizens (as a class) and for any other class of users for whom the City deems such rate relief necessary and appropriate on the basis of need.

The City reserves the right to establish surcharge rates for any or all user classes to be used during water shortage emergencies. Such emergencies may be declared only by the City Council.

SECTION 6
FREQUENCY OF METER READING

Meter reading shall be recorded at approximately the same time each month. If the period covered by a meter reading varies by more than seven days from a calendar month, block rates shall be adjusted to what they would have been for a month at the average daily usage for the reading.

SECTION 7
METERING REQUIREMENTS

Each new user shall be served by an individual meter. Each existing user shall normally be served by an individual meter. However, in cases where two or more users are located on the same premises, such as apartments or mobile home parks, the City Manager may allow continued use of a master meter if individual meters are impractical to install.

No user may obtain water on the same premises from more than one meter for the purpose of avoiding the increasing block rate for a higher volume of usage. If separate meters are allowed for the purpose of separating the volume of water not returned to the sewer system, the meter readings may be combined for the purpose of calculating water charges.

SECTION 8
WHOLESALE USERS

1. The City shall not enter into any future contract for water service to any municipality or water supply corporation outside its own boundaries unless the contract contains one of the following provisions:
 - (a) The entity agrees to adopt a water conservation program acceptable to the Texas Water Development Board, or relevant provisions of the City's Water Conservation Program including a rate structure which does not provide discounts for large volumes of usage; or,
 - (b) The entity agrees to meet the requirements of provision (a) in the future if so required by the City.
2. The City shall not supply wastewater service to any municipality or water supply corporation outside its own boundaries unless that entity adopts, or agrees to adopt, a water conservation program acceptable to the Texas Water Development Board. Alternately, such entities may adopt the relevant provisions of the City's Water Conservation Program including a rate structure which does not provide discounts for large volumes of usage.
3. The City shall notify each outside entity that the entity may be subject to more strenuous requirements, including an increasing block rate structure, in the future if circumstances should warrant.
4. These requirements shall not apply to emergency supplies due to water supply emergencies in other communities.

SECTION 9
WASTEFUL USE

No person, firm, or corporation shall use City water wastefully and without purpose, even though he pays the prescribed charges for such water.

SECTION 10
VALIDITY

All ordinances in conflict herewith are hereby repealed. If any section or provision of this ordinance, or the application of same to any person or set of circumstances is invalidated or rendered unenforceable by a court of competent jurisdiction, such judgement shall not affect the validity of any remaining parts of the ordinance which can be given effect without the invalidated part or parts, or their application to other persons or sets or circumstances.

SECTION 11
EFFECTIVE DATE

This Ordinance shall be in full force and effect with the _____
billing from and after its final passage, approval, recording, and publication as provided by law.

PASSED AND APPROVED on first reading this the _____ day of _____,
19__.

CITY OF XXXXXXXX, XXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

Approved as to Form:

Attorney for City

PASSED AND APPROVED on second and final reading this the _____ day of _____,
19__.

CITY OF XXXXXXXX, XXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

EXHIBIT 7

**PROPOSED ORDINANCE
FOR FIXING RATES**

ORDINANCE
FIXING RATES
FOR WATER SERVICE FURNISHED BY

CITY OF XXXXXXXXX
XXXXXX COUNTY, TEXAS

WHEREAS, the City of Xxxxxx has adopted a WATER RATE SYSTEM ORDINANCE to collect revenues for DEBT SERVICE, for CURRENT CAPITAL IMPROVEMENTS, and for the OPERATION AND MAINTENANCE of a PUBLICLY OWNED WATER WORKS; and

WHEREAS, these revenues must be sufficient to cover all costs for OPERATION AND MAINTENANCE of said PUBLICLY OWNED WATER WORKS, for CURRENT CAPITAL IMPROVEMENTS to the PUBLICLY OWNED WATER WORKS, and for payment of BONDED INDEBTEDNESS for the PUBLICLY OWNED WATER WORKS; and

WHEREAS, the WATER RATE SYSTEM ORDINANCE contains various requirements for establishing water rates; and

WHEREAS, the WATER RATE SYSTEM ORDINANCE provides for annual determination of user charges for water service;

NOW, THEREFORE LET IT BE ORDAINED by the City Council of the City of Xxxxxx:

SECTION 1
DEFINITION OF USER

Where more than one residential, commercial, or industrial unit is served by the same water meter, each unit shall constitute a separate user, except in the case of wholesale users.

SECTION 2
PRESCRIBED CHARGES

The following rates per month shall be the rates charged for water service furnished to retail customers within the boundaries of the City.

Minimum monthly charge for first ____ gallons per month:

\$ _____

Over 2000 gallons: \$ _____ per 1000 gallons

Rates for retail customers outside the City, if any, shall be ____ times the rates for service inside the City.

Where more than one residential, commercial, or industrial unit is served by the same meter (except for wholesale users):

- a. The minimum monthly charge shall be equal to the sum of the minimum monthly charges which would apply to the various units if they were metered separately. Units which are vacant for any given month are excluded.
- b. The minimum monthly charge shall cover the first ____ gallons times the number of units.

Wholesale water service shall be at rates negotiated between the City and wholesale user.

SECTION 3 OTHER CHARGES

Other charges related to water service shall be as prescribed by other City ordinances.

SECTION 4 SUFFICIENCY OF REVENUE

The City Council has determined that the water charges prescribed in this ordinance are necessary and sufficient to cover all costs of debt service and operation and maintenance of the City's water production, treatment, and distribution system, after adjusting for the following factors:

1. Other revenue sources such as sewer charges, ad valorem taxes, grants, and interest income.
2. The portion of that other revenue required for debt service and operation and maintenance of the sanitary sewer system.
3. The portion of that other revenue required for current capital improvements to water and sewer systems.

SECTION 5 DISCONNECTION OF SERVICE

1. The City may disconnect water service to any customer for any of the following reasons:
 - a. Written request of the customer.
 - b. Failure to pay all water and sewer charges within 30 calendar days after the date of issuance of the bill.
 - c. Existence of a known dangerous condition resulting from water service to that customer.
 - d. Service established through meter bypassing, unauthorized connection, or unauthorized reconnection.

- e. Tampering with meter.
 - f. Any reasons listed in the Sewer Use Ordinance.
2. If disconnection is solely due to failure to pay bills the City must:
- a. Give 10 calendar days notice prior to reconnection.
 - b. Have City personnel available to collect delinquent bills and to make reconnection on the day of disconnection and on the following day.

SECTION 6
VALIDITY

All ordinances or parts of ordinances in conflict herewith are hereby repealed. If any section or provision of this ordinance, or the application of same to any person or set of circumstances is invalidated or rendered unenforceable by a court of competent jurisdiction, such judgement shall not affect the validity of any remaining parts of the ordinance, which can be given effect without the invalidated part or parts, or their application to other persons or sets of circumstances.

SECTION 7
EFFECTIVE DATE

This Ordinance shall be in full force and effect with the _____
billing from and after its final passage, approval, recording, and publication as provided by law.

PASSED AND APPROVED on first reading this the _____ day of _____
19__.

CITY OF XXXXXXXX, XXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

Approved as to Form:

Attorney for City

PASSED AND APPROVED on second and final reading this the _____ day of _____,
19__.

CITY OF XXXXXXXX, XXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

EXHIBIT 8

**WATER CONSERVATION AND
DROUGHT CONTINGENCY PROGRAM
ANNUAL REPORT**

Return completed form to:

Executive Administrator
Texas Water Development Board
P.O. Box 13231
Austin, Texas 78711-3231
ATTN: CONSERVATION

For Questions and Information call:
Municipal Water Conservation Unit
(512) 463-7989

Water Conservation and Drought Contingency Program Annual Report

TWDB Code No.

Texas Water Development Board (TWDB) "Rules Relating to Financial Programs" require that recipients of TWDB financial assistance for which a water conservation and drought contingency program is required, shall report annually to the TWDB's Executive Administrator. The report must contain information on the **implementation, public response, and effectiveness** of the water conservation program. The required annual reports should be submitted within sixty (60) days after the anniversary date of loan closing until all financial obligations to the state have been discharged.

The following questions are designed to provide the TWDB this information in a concise and consistent format for all loan recipients. Please fill in all blanks that pertain to your program as completely and objectively as possible. **If you need additional space or wish to attach a separate report, please feel free to do so using the same numbering sequence.**

IMPLEMENTATION PROGRESS

Long-Term Water Conservation Program

1. Education and Information Program

During the past 12 months, _____ (total number) water conservation brochures were mailed or otherwise distributed to utility customers during the months of _____. Approximately _____ (number) brochures were distributed to customers through mailouts, _____ as handouts at the utility office, and _____ through field employees or other means. Also, _____ news articles were submitted and published in the _____ (newspaper, newsletter). In addition, water conservation messages were printed on bills during the months of _____ (Please attach example.)

In addition, the following education activities were conducted during the reporting period (presentations, school programs, exhibits, television, radio etc _____

(Please attach copies of materials as appropriate)

2. **Water Conservation Plumbing Code**

Which plumbing code does your utility follow? _____
Does this plumbing code include special water conservation requirements? _____

3. **Water Conservation Retrofit and Plumbing Rebate Programs**

Have you conducted a plumbing retrofit or rebate program during the last 12 months? _____
If yes, approximately _____ households receive kits/rebates _____
Please describe your program and list specific retrofit items provided or types of fixtures rebated. _____

4. **Conservation - Oriented Rate Structure**

Please provide your current water and wastewater rate schedule in the space below, or attach a preprinted rate schedule to this report.

Have your rates or rate structure changed since your last report? _____. If yes, please describe the changes or attach a copy of the old and new rate structures. _____

_____ If you purchase water from a wholesale supplier, please list the supplier(s) _____

_____ and the rates you are charged by them _____
_____ Is this a "take or pay" contract? _____ If yes, what is your minimum volume to take? _____ gallons/day.

5. **Universal Metering and Meter Repair**

During the past 12 months, what is the approximate number of:

Production (master) meters	tested _____, repaired _____, replaced _____.
Meters larger than 1½"	tested _____, repaired _____, replaced _____.
Meters 1½" or smaller	tested _____, repaired _____, replaced _____.

In the system there are _____ production (master) meters. In addition, there are _____ meters larger than 1½", and _____ meters 1½" or smaller.

6. **Water Audits and Leak Detection**

The amount of water purchased or produced during the last 12 months was _____ gallons.

The amount of water sold through metered accounts during the last 12 months was _____ gallons.

What is the percent of unaccounted-for water in your utility? _____ percent.
How often do you audit or account for the water in your system? _____ List
source and amount in gallons for the last 12 months, if known, of metered and unmetered water
that is accounted for but not sold (line flushing, city facilities, cemetery, etc.). _____

During the last 12 months, _____ leaks were repaired in the system. Approximately _____
of these leaks were in main lines, _____ were at service connections, _____ were fire
hydrants, and _____ were at other points. What types of equipment or methods do you use
to locate leaks in your distribution system? _____

Approximately how much has your accountability improved as a result of leak repair? For
example: a 10 gpm leak that has gone unrepaired for at least 10 days has lost 144,000 gallons of
water. (10 gpm x 60 min/hr. x 24 hr./day x 10 days) _____

7. **Water-Conserving Landscaping**

Please list any water-conserving landscaping programs, educational activities, or ordinances
enacted during the last 12 months. _____

8. **Recycling and Reuse of Water or Wastewater Effluent**

What types of water recycling or reuse activities, such as golf course irrigation, recycling filter
backwash, or effluent reuse for irrigation or effluent chlorination, etc. are practiced by your
utility? _____

_____ This recycling or reuse amounted to
approximately _____ gallons per month for _____ months during the reporting
period.

9. **Other Comments**

List any other water conservation activities your utility is conducting. _____

Emergency Water Demand Management or Drought Contingency Plan

10. During the past 12 months, the Emergency Demand Management or Drought Contingency Plan was activated for _____ days, beginning on _____ and ending on _____. The reason for activation was _____

- Water demand was reduced by approximately _____ gallons per day.

PUBLIC RESPONSE

11. Briefly describe any public response your utility has received regarding the water conservation and/or the emergency water demand management program. _____

EFFECTIVENESS OF THE PROGRAM

12. In your opinion, how would rank the effectiveness of your utility's program?
Very effective _____ Effective _____ Somewhat effective _____
Less than effective _____ Not effective _____
13. Does the operations staff of your utility review the conservation program on a regular basis? _____
If so, how often? _____
14. What types of problems did your utility encounter in implementing the program during the last 12 months? _____

15. What might your utility do, or what could the TWDB do, to improve the effectiveness of your program? * _____

16. How much additional expense has your utility incurred in implementing this program during the reporting period (literature, materials, staff time, etc.)? \$ _____

17. Approximately how much water would you estimate your utility saved during the reporting period due to the overall conservation program? _____ million gallons

What is the estimated dollar value to the utility of this water savings? \$ _____

18. Approximately how much would you estimate your water accountability has improved during the reporting period as compared to the previous 12 months? _____%

To ensure we address future correspondence to the proper person, please type or print the following:

Name	Title	Phone	Date
------	-------	-------	------

* For a list of free technical assistance services available from the TWDB, please write or call at (512) 463-7955.

EXHIBIT 9

**PROPOSED SUPPLEMENTARY PLUMBING
ORDINANCE**

ORDINANCE

SUPPLEMENTING AND AMENDING THE EXISTING ORDINANCE GOVERNING WATER AND SEWER SERVICE BY THE CITY; REQUIRING CERTAIN WATER CONSERVING FEATURES IN NEW, REPLACEMENT, AND EXISTING PLUMBING; ADOPTING AND SUPPLEMENTING THE WATER CONSERVATION PROVISIONS IN THE STANDARD PLUMBING CODE; REFERRING TO A 1991 AMENDMENT TO THE HEALTH AND SAFETY CODE OF THE TEXAS STATUTES; PROVIDING ENFORCEMENT HEREOF; AND PROVIDING SAVINGS AND REPEALING CLAUSES.

WHEREAS, in order to obtain a loan from the Texas Water Development Board (TWDB) for participation in new regional water treatment and transportation facilities, the City of XXXXXXXXX was required to submit a Water Conservation Program to the TWDB; and,

WHEREAS, the TWDB guidelines for the Water Conservation Plan recommend provisions for water conserving features in home plumbing; and,

WHEREAS, Senate Bill 587 of the 72nd Legislature contains additional requirements for water conserving features in home plumbing; and,

WHEREAS, the City of XXXXXXXXX has adopted ordinances governing water and sewer service provided by the City; and,

WHEREAS, among such ordinances is Chapter 31 of the XXXXXXXXX City Code, PLUMBING AND GAS CODE, adopted in its present form by ordinance of July 11, 1988; and,

WHEREAS, Chapter 31 includes adoption of the Standard Plumbing Code, 1988 Edition as published by the Southern Building Code Congress International, but does not adopt the optional water conservation provisions included in the Standard Plumbing Code as an appendix; and,

WHEREAS, in order to meet the TWDB guidelines for water conservation, certain water conservation provisions are necessary or desirable; and,

NOW, THEREFORE LET IT BE ORDAINED by the City Council of the City of XXXXXXXXX:

SECTION 1
AMENDMENT TO EXISTING ORDINANCE

This ordinance shall constitute an amendment and supplement to the existing Chapter 31 of the XXXXXXXXX City Code.

AREA OF JURISDICTION

This ordinance shall apply to all users of the City of XXXXXXXXX water system who are also subject to the requirements of City plumbing codes, including the Standard Plumbing Code or any other published plumbing codes which may be adopted by the City.

SECTION 3 REQUIREMENTS FOR NEW OR REPLACEMENT PLUMBING

1. All hot water lines shall be insulated.
2. All new swimming pools shall have recirculating filtration equipment.
3. The requirements above and the requirements of Appendix J of the Standard Plumbing Code, 1988 Edition (except as modified herein), shall apply to any new plumbing and to any replacement of existing plumbing, regardless of the reason for replacement.
4. The requirements of Chapter 421 of the Health and Safety Code, as adopted through Senate Bill 587 of the 72nd Legislature in 1991, shall govern any new or replacement plumbing to the extent that they are more strenuous than other requirements of this ordinance.
5. The following water use limits are hereby placed on certain fixtures in lieu of limits specified in Appendix J:
 - a. Toilets -- 1.6 gal./flush except as allowed in subsection b.
 - b. Wall-mounted toilet using flushmeter or flush valve -- 2 gal./flush.
 - c. Urinals -- 3 gal./flush for tank type, 1 gal./flush for flush valve type.
 - d. Kitchen and private lavatory faucet -- 2.2 gpm.

SECTION 4 RETROFIT ITEMS

1. The City may require the following retrofit items to be installed on existing plumbing where applicable, upon proper notice to the owner of the building as specified below:
 - a. Displacement devices in toilet tanks (minimum reduction of 0.5 gallons/flush, made of a material which will not disintegrate or flake off in water).
 - b. Low flow showerheads (maximum flow 2.75 gallons/minute at 80 psi).
 - c. Insulation for hot water lines (for accessible portions of existing lines).
2. Displacement devices shall not be required for toilet tanks designed for low flow in their

existing form.

3. Retrofit devices shall not be required where they are impractical or expensive to install.
4. The City shall impose retrofitting requirements as soon as practical under either of the following circumstances:
 - a. Requirement by the Texas Water Development Board and/or the Texas Natural Resource Conservation Commission in connection with the Water Conservation Program; or
 - b. Determination by the City Council that such retrofit devices are needed because of an existing or imminent water shortage.

In either event, the City shall notify the owner of each single family residence, multiple family residence, nonresidential building, or other water using facility within the area of jurisdiction. The notice shall specify a period between 90 days and one year during which the specified retrofit items must be installed.

5. If retrofitting is imposed, it shall apply to all residential and nonresidential users of the City water system uniformly.

SECTION 5 PERMITS

Permit requirements for any work required by this ordinance shall be according to governing City ordinances. However, no permit fee shall be required for retrofit devices to be installed (voluntarily or by City requirement) according to Section 4 of this ordinance.

SECTION 6 INSPECTION

All plumbing work constructed according to this ordinance shall be inspected by City personnel (or by any other persons authorized by the City) according to applicable City ordinances, including any applicable sections of the Standard Plumbing Code adopted by reference.

SECTION 7 AVAILABILITY OF REGULATION

Copies of the Standard Plumbing Code, Senate Bill 587, and any applicable standards referenced therein shall be kept available for inspection at the City Clerk's office in the City of XXXXXXXX during normal business hours on a permanent basis.

SECTION 8 PENALTIES

Any person, firm, or corporation violating any provision of this ordinance shall be fined not less than Ten Dollars (\$10.00) nor more than Two Hundred Dollars (\$200.00) for each offense; and a separate offense shall be deemed committed on each and every day during or on which a violation occurs or is permitted to continue.

In addition to the fines, the City may terminate water service to any user for repeated or flagrant violations of this ordinance. Reconnection may be made only after the user pays all outstanding bills and fines, plus a \$10.00 service charge. Reconnection of a commercial or recreational user may be postponed by the City if, in the opinion of the City, such postponement is necessary to conserve water in an acute emergency.

The City also may, at its option, install a flow restricter in the service line of any user for repeated or flagrant violations of this ordinance. Such restricter may be set at any amount of flow equal to or larger than the amounts listed in other City ordinances as the minimum amounts for water rationing. The City may charge the user for the cost of the flow restricter, including installation, and may disconnect service for failure to pay for this item.

In the case of new construction, the City may refuse connection of water and/or sanitary sewer service to a new structure or facility until the requirements of this ordinance have been met.

In addition to the penalties listed above, the City may bring any civil action in a state court as prescribed in Senate Bill 587.

SECTION 9 **VALIDITY**

All ordinances or parts of ordinances in conflict herewith are hereby repealed. If any section or provision of this ordinance, or the application of same to any person or set of circumstances is invalidated or rendered unenforceable by a court of competent jurisdiction, such judgement shall not affect the validity of any remaining parts of the ordinance, which can be given effect without the invalidated part or parts, or their application to other persons or sets of circumstances.

SECTION 10 **EFFECTIVE DATE**

This Ordinance shall be in full force and effect from and after its final passage, approval, recording, and publication, as provided by law.

PASSED AND APPROVED on first reading this the ____ day of _____.

CITY OF XXXXXXXXX, XXXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

Approved as to Form:

Attorney for City

PASSED AND APPROVED on second and final reading this the ____ day of _____.

CITY OF XXXXXXXXX, XXXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

EXHIBIT 10

**PROPOSED RESOLUTION FOR ANNUAL
REPORTING**

RESOLUTION

Be it resolved by the City Council of the City of XXXXXXXXX that the City of XXXXXXXXX will submit an annual report to the Texas Water Development Board as follows:

Subject: Water Conservation Program, including specifically (a) program implementation progress and (b) public response; and also such other topics as may be prescribed periodically by the Texas Water Development Board.

Schedule: Once per year as prescribed by Texas Water Development Board, on or before sixty days after each anniversary of loan closing until all indebtedness to the Texas Water Development Board is paid in full, or until otherwise released by the Texas Water Development Board.

Be it further resolved that the City of XXXXXXXXX will provide such additional information and responses which may be required by the Texas Water Development Board following review of said report.

(Title) _____

(City Seal)

ATTEST:

(Secretary or Clerk)

Date: _____

EXHIBIT 11

MUNICIPAL FACILITY CAPACITIES

MUNICIPAL FACILITY CAPACITIES

ENTITY	SOURCE		PRES CAP (mgd)	FUT REQ CAP				CLRWELL CAP (mgal)	FUT CLRWELL CAP				STRG CAP (mgal)	FUT STRG CAP				ELEV STRG CAP (mgal)	FUT ELEV STRG CAP			
	SFC	GRND		2020 (mgd)	FAC ADEQ	2045 (mgd)	FAC ADEQ		2020 (mgal)	FAC ADEQ	2045 (mgal)	FAC ADEQ		2020 (mgal)	FAC ADEQ	2045 (mgal)	FAC ADEQ		2020 (mgal)	FAC ADEQ	2045 (mgal)	FAC ADEQ
BEAUMONT	X	X	43.50	44.71		51.76			2.24	N	2.59	N	24.80	9.19		10.75		4.80	4.60		5.37	N
BEVIL OAKS MUD		X	0.58	0.49		0.60		0.15	0.02		0.03		0.15	0.11		0.14		0.018*	0.011		0.014	
CHINA		X	0.46	0.42		0.51		NA	NA		NA		0.30	0.10		0.12		0.30	0.05		0.06	
GROVES	X		5.50	5.56		6.34		4.00	0.28		0.32		5.63	1.29		1.47		1.50	0.64		0.73	
PT NECHES	X		6.00	4.43		4.98		2.46	0.22		0.25		3.16	1.00		1.12		0.70	0.50		0.56	
NEDERLAND	X		6.00	5.34		5.69		3.45	0.27		0.28		4.95	1.17		1.24		1.50	0.58		0.62	
W JEFF COMWD	X		1.05	2.30	N	2.46	N	0.31	0.12		0.12		0.66+	0.51		0.54		0.35	0.25		0.27	
NOME	X		0.25	0.23		0.24		0.07	0.01		0.01		0.25	0.05		0.06		0.18	0.03		0.03	
PT ARTHUR	X		26.00	20.79		23.28		2.00	1.04		1.16		8.99	4.50		5.06		4.50	2.25		2.53	
LMUD		X	4.80	6.33	N	8.16	N	NA	NA		NA		1.60	1.46		1.89	N	1.00	0.73		0.94	
KOUNTZE		X	1.44	1.03		1.26		NA	NA		NA		0.76	0.24		0.29		0.20	0.12		0.15	
SOUR LAKE		X	1.12	0.63		0.77		NA	NA		NA		0.70	0.15		0.18		0.10	0.07		0.09	

EXHIBIT 12

**PROPOSED ORDINANCE CONTROLLING
WATER
USAGE IN EMERGENCIES**

ORDINANCE
CONTROLLING WATER USAGE DURING EMERGENCIES:
EMPOWERING CITY COUNCIL TO DECLARE EMERGENCIES:
AND PRESCRIBING PENALTIES FOR VIOLATION THEREOF

WHEREAS, the City of XXXXXXXXX finds it necessary to control and/or limit water use during an emergency;

NOW, THEREFORE LET IT BE ORDAINED by the City Council of the City of XXXXXXXXX:

SECTION 1
DEFINITION OF USER

Except as provided in Sections 8 and 9, users shall include only retail customers served directly by the City water system, whether located within or outside the City, and not customers of wholesale users such as other cities, water districts, or water supply corporations.

Where more than one residential or commercial unit is served by the same water meter:

1. For surcharging or rationing purposes, each unit shall constitute a separate user.
2. For disconnection purposes, the person, firm, or corporation responsible for the master meter shall be considered the user.

SECTION 2
DECLARATION OF EMERGENCY

The City Council may, at any properly posted, convened, and conducted meeting, declare the City to be in a water usage emergency requiring one or more of the following actions:

1. Water Waste
Prohibition of all water waste as defined in Section 3.
2. Outdoor Water Usage
 - a. Alternate days for usage
 - b. Prohibition of usage
 - c. Other restrictions
3. Control Measures for Indoor Usage
 - a. Surcharge system

- b. Rationing
- c. Flow restricters (for violators only)

4. Variances

- a. Variances for certain commercial users as prescribed in Section 7.
- b. Overriding of any standing variances which may have been previously granted.

SECTION 3
WATER WASTE AND OUTDOOR WATER USAGE

1. The City Council may, after declaring a water usage emergency, prohibit all water waste defined as follows:
 - a. Washing vehicles, buildings, and other similar items unless a bucket or a hose with a cutoff device at the downstream end of the hose is used.
 - b. Allowing water from vehicle washing, building washing, or plant watering to run excessively onto streets or sidewalks.
 - c. Recreational use of sprinklers or hoses.
 - d. Using water for ornamental fountains.
 - e. Any other water use, indoor or outdoor, which is obviously wasteful.
2. The City Council may, after declaring a water usage emergency, prohibit any or all of the following outdoor water usages:
 - a. Watering of grass, lawns, flowers, trees, gardens, or shrubbery
 - b. Washing vehicles, buildings, or swimming pools
 - c. Recreational purposes (including filling swimming pools)
 - d. Ornamental fountains
3. The City Council may, after declaring a water usage emergency, restrict any or all of the outdoor water usages listed in Subsection 2 to alternate days as follows:
 - a. Even numbered house, business, lot, or premise:
Tuesdays, Thursdays, and Saturdays only.
 - b. Odd numbered house, business, lot, or premise:

Mondays, Wednesdays, and Fridays only.

- c. House, business, lot or premise with no visible number or no number known to City:
Same as odd numbers.
- 4. On or after the date when the City Council shall meet and declare a water usage emergency requiring any or all of the restrictions described in Subsections 1, 2, and 3, it shall be unlawful for any person, firm, or corporation to violate any of these restrictions, unless the City Council grants an applicable variance and has not overridden such variance for the specific emergency.

SECTION 4
SURCHARGE SYSTEM

The City Council may, after declaring a water usage emergency, impose surcharges not to exceed the following amounts on all water usage (per two month period) by any user:

0 - 6,000 gallons	0.75 per 1000 gallons
6,000 - 10,000 gallons	\$1.00 per 1000 gallons
10,000 - 20,000 gallons	\$1.50 per 1000 gallons
Over 20,000 gallons	\$1.75 per 1000 gallons

No surcharge for any bracket may be less than the surcharge for the next lower bracket.

These surcharges shall become effective for each user as soon as the City can read the meter serving that user and notify that user.

SECTION 5
RATIONING

The City Council may, after declaring a water usage emergency, impose rationing on any or all user classes. The daily amount which each user may be permitted to use shall be set equal to or greater than the following amounts:

Residential - 50 gallons	School - 100 gallons (plus 5 gallons/student on days classes are held)
Commercial - 100 gallons	
Recreational Facility - 300 gallons	Industrial - 300 gallons

Rationing shall become effective for each user as soon as the City can read the meter serving that user and notify that user.

SECTION 6
COMMERCIAL USE

The City Manager may, in a water shortage emergency, direct any or all commercial, industrial, and recreational users to suspend use of City water for purposes other than domestic use. He may take this action regardless of whether the City Council has declared a water usage emergency.

SECTION 7 APPEAL PROCEDURE

The City shall, as soon as practical after the effective date of this ordinance, notify all nonresidential users of the following facts:

1. Businesses which use outdoor water in their primary business functions (such as commercial car washes) may be considered for variances from emergency restrictions or prohibitions of outdoor water usage.
2. The City may restrict or prohibit such outdoor usage, even if a business qualified for a variance, if the water shortage emergency is severe enough to impose such restriction or prohibition.
3. Any businesses which feel that they may qualify for variances are encouraged to request (preferably in nonemergency time) that the City grant a standing variance.
4. Such businesses shall show to the City sufficient cause for granting the variance.
5. The City may grant a specific variance during a water shortage emergency, or may override a standing variance.

The City shall notify all new nonresidential customers of the above facts at the time they apply for or receive service.

SECTION 8 NOTIFICATION OF USERS

The City shall notify all users (*including designated representatives of wholesale users*) promptly when a water supply emergency is declared. For prohibition of outdoor water usage, such notice may be through local news media. For surcharges or rationing, such notice shall be in writing for each user if practical, preferably delivered along with the meter reading. The individual notice shall, if practical, show the date and amount of the meter reading.

SECTION 9 APPLICABILITY OF RESTRICTIONS

Water use restrictions and surcharges contained in this ordinance shall apply to all water supplied

by the City water system to its retail customers, whether located within or outside the City.

The following rules shall govern wholesale users and their customers:

1. Restrictions on outdoor or other usage shall not apply to customers of wholesale users unless provided in the contract between the City and the wholesale user.
2. Surcharges shall not apply to wholesale users or to their customers unless provided in the contract between the City and the wholesale user. If the surcharges are to be applied, they shall become effective for each customer of the wholesale user as soon as the wholesale user can read that customer's meter. The surcharges prescribed by emergency resolution shall be collected by the wholesale user in its billing cycle and passed on directly to the City. Nothing in this ordinance shall prevent the wholesale user from assessing an additional surcharge to defray its own expenses.
3. Rationing shall not apply directly to customers of wholesale users unless provided in the contract between the City and the wholesale user. Otherwise, each wholesale user shall be rationed to the total amount of water to which its individual customers would be entitled under the emergency resolution. This amount shall be determined by the City according to available information on the number and type of individual customers.
4. Any restriction, surcharges, or rationing adopted under authority of this ordinance shall be applied uniformly to the City's retail customers and to such wholesale users and/or their customers as may be applicable.

SECTION 10 DURATION OF RESTRICTIONS

All restrictions contained in this ordinance shall remain in effect until terminated by further Council action, unless, at the time the Council initiates the restrictions, or at a subsequent meeting:

1. The Council sets a specific time limit, or
2. The Council delegates authority to the City Manager to terminate the restrictions at his discretion.

SECTION 11 PROCEDURAL REQUIREMENTS

The Council may initiate and terminate water usage emergencies and accompanying restrictions by means of simple motions recorded in the minutes, so long as the intent of the action is made clear. Any rules requiring reading at two or more meetings are automatically suspended for all actions authorized by this ordinance.

SECTION 12 PENALTIES

Any person, firm, or corporation violating any provision of this ordinance shall be fined not less than Ten Dollars (\$10.00) nor more than Two Hundred Dollars (\$200.00) for each offense; and a separate offense shall be deemed committed on each and every day during or on which a violation occurs or is permitted to continue.

In addition to the fines, the City may terminate water service to any user for repeated or flagrant violations of this ordinance. Reconnection may be made only after the user pays all outstanding bills and fines, plus a \$10.00 service charge. Reconnection of a commercial or recreational user may be postponed by the City if, in the opinion of the City, such postponement is necessary to conserve water in an acute emergency.

The City also, may at its option, install a flow restricter in the service line of any user for repeated or flagrant violations of this ordinance. Such restricter may be set at any amount of flow equal to or larger than the amounts listed in Section 5 of this ordinance. The City may charge the user for the cost of the flow restricter, including installation, and may disconnect service for failure to pay for this item.

SECTION 13 VALIDITY

All ordinances or parts of ordinances in conflict herewith are hereby repealed. If any section or provision of this ordinance, or the application of same to any person or set of circumstances is invalidated or rendered unenforceable by a court of competent jurisdiction, such judgement shall not affect the validity of any remaining parts of the ordinance, which can be given effect without the invalidated part or parts, or their application to other persons or sets of circumstances.

SECTION 14 EFFECTIVE DATE

This Ordinance shall be in full force and effect with the _____ billing from and after its final passage, approval, recording, and publication, as provided by law.

PASSED AND APPROVED on first reading this the ____ day of _____.

CITY OF XXXXXXXXX, XXXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

Approved as to Form:

Attorney for City

PASSED AND APPROVED on second and final reading this the ____ day of _____.

CITY OF XXXXXXXXX, XXXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

EXHIBIT 13

**PROPOSED BROCHURE CONCERNING
EMERGENCY MEASURES**

(To be Distributed in Advance of Water Shortages)

EMERGENCY MEASURES
FOR
WATER SHORTAGE
CITY OF XXXXXXXX, XXXXXXXX COUNTY, TEXAS

Most Southeast Texans think of a water shortage as something that occurs in Austin, San Antonio, or other arid portions of the state. With all the abundant surface water supply in the Neches River for XXXXXXXX County, the Midcounty area should have all the water it could ever use. Why should we ever have to worry about saving water?

A number of things can happen to interrupt the water supply in XXXXXXXX. Most of these events are short term emergencies such as extended power failure; failure of pumps, tanks, canals, transmission lines, and other components of the water system; severe freezes resulting in broken pipes; severe storms; and major fires which use up water supplies. Long term shortages could occur in the future in the event that local surface water becomes contaminated.

Although the City is responsible for taking whatever measures are needed to restore full water service, local residents can do many things to help save water in the mean time. These measures may be voluntary or mandatory, depending on the nature of the crisis. In any event, the homeowner needs to know ahead of time what will be expected of him.

Many suggestions for water saving can be found in the six page water conservation flyer which was passed out earlier. These tips were intended for long term conservation, but can come in very handy in an emergency. If you cannot find your copy of the flyer, come by the Public Works Department at 4925 McKinley, just off F. M. 366 at the water plant, for a copy.

There are many other emergency measures not covered in the flyer. Some of these measures may be requested or required when an emergency strikes. These measures include, but are not limited to, the following:

1. Stopping all outdoor water usage, or limiting it to alternate days.
2. Turning off the water at the meter just before a severe freeze. All outdoor faucets should be drained and the water saved for indoor use. An adequate supply of water should be saved before cutting off the water to last through the freeze.

NOTE: Do not leave water dripping all night through the faucets. Beaumont residents did that a few years ago in a big freeze, and it almost used up their water supply.

3. Better still, try to protect all piping from the freeze. Wrap all outdoor faucets with newspapers and cover with a plastic bag. If your house is on blocks, cover the sides temporarily to keep the wind from going under the house. This way you can leave the water turned on. Be sure to draw some water in advance, though, in case there is a shortage.

4. If a severe storm is coming, follow instructions of the emergency management agency or

other applicable agency. If you are staying through the storm, draw water in advance to last several days and watch for reports of contamination. Be ready to purify water before drinking it.

5. If the water supply becomes contaminated, be ready to buy bottled water or to purify the City water. Purification might be by boiling or by tablets. Some types of chemical pollution cannot be purified, so it may pay to store up bottled water ahead of time.

EXHIBIT 14

DELINEATION OF RESPONSIBILITY

DELINEATION OF RESPONSIBILITY

CITY OF XXXXXXXXX

A. Director of Public Works:

1. Supervises Education and Information program.
2. Groups water customers into classes for purposes of water rates and/or rationing should such classification become necessary, then notifies customers; also, is first level of appeal for customers disagreeing with classification.
3. Annual review of program operation (*submits findings to City Manager*).
4. Recommends recycling for large users (*joint jurisdiction with City Manager*).
5. Supervises monitoring for trigger conditions.
6. Reports to City Manager in the event that alternate water supply may be needed on long term or emergency basis.
7. Recommends to City Manager that expansion of water system capacity or providing additional treatment is needed, if appropriate.
8. Recommends action against polluters of upstream water supply, if appropriate.
9. Notifies City and neighboring fire departments of acute water shortage, if necessary (*joint jurisdiction with City Manager*).
10. Arranges for notification of water customers in case of widespread emergency.
11. Recommends standing variances to potential water rationing.
12. Arranges for notification of termination or downgrading of emergencies.
13. Receives applications for standard variances to water rationing, and recommends appropriate action to City Manager.
14. Reviews water rates periodically and recommends increases to City Manager, if appropriate.
15. Reviews the need for any possible plumbing retrofit requirements and provides recommendation to City Manager.
16. Supervises advance planning for emergencies, including maintaining files on any

wholesale water customers showing contact persons and number of customers.

17. Maintains communications with LNVA regarding any factors pointing to long or short term shortages.
18. Approves major repairs for water system *(or, if warranted, passes recommendation to City Manager)*.

B. City Manager:

1. Recommends increasing block rate to Council, if appropriate *(unless task is delegated to consultants)*.
2. Second level of appeal for customers disagreeing with classification for water rate and/or rationing purposes.
3. Annual review of program operation *(reviews findings of Director of Public Works, then submits findings to Council for approval)*.
4. Submits annual reports to Texas Water Development Board.
5. Recommends recycling for large users *(joint jurisdiction with Director of Public Works)*.
6. Overall responsibility for monitoring performance of City facilities.
7. Recommends that City Council declare a water supply emergency, and accordingly recommends specific measures for Council to take such as rationing and/or surcharges, including specific numbers for such measures. Conversely, recommends termination or downgrading of emergency.
8. Declares a water supply emergency *(if circumstances indicate the need for such action on his part without calling a Council meeting for that purpose)*.
9. Approves major repairs to water facilities if required by the magnitude of repairs.
10. Contacts neighboring water systems in emergency if water is needed from interconnect.
11. Initiates action *(following recommendation of Director of Public Works)* toward expanding system capacity, providing additional treatment, or obtaining a long term alternate supply.
12. Discusses any necessary action against polluters of upstream water supply with City Attorney, then if appropriate brings matter before Council.
13. Notifies City and neighboring fire departments of acute water shortage, if necessary *(joint jurisdiction with Director of Public Works)*.

14. Arranges for public notice for voluntary lawn watering schedule and/or reduced industrial/commercial usage when appropriate.
15. Notifies of curtailment of specified commercial, industrial, and recreational use.
16. Announces the end or downgrading of a crisis (*if he declared the crisis, or if authorized by Council to end crisis*) and takes any appropriate measures accordingly.
17. Notifies outside entities purchasing wholesale water and sewer services of need to adopt water conservation provisions, and of possible strenuous requirements in future.
18. Makes decisions regarding applications for standing variances to water rationing.
19. Notifies City Attorney in advance of any proposed Council action.
20. Takes action against violators (*in consultation with City Attorney*).
21. Reviews any need for rate increases and recommends action to Council.
22. Recommends imposition of plumbing retrofit requirements if needed.

C. City Attorney:

1. Reviews all proposed actions by City Council.
2. Discusses any proposed legal action or major contracts with City Manager before such items are presented to Council.
3. Consults with City Manager regarding action against violators.

D. City Council:

1. Enacts all necessary ordinances and resolutions for initial implementation of program, including initial endorsement of program for submittal to TWDB.
2. Enacts all necessary ordinances to adjust rates and/or go to increasing block rate if appropriate.
3. Reviews and approves City Manager's annual report to TWDB.
4. Adopts resolutions declaring water supply emergency and taking appropriate actions, and conversely resolutions downgrading or terminating emergencies.
5. Approves major contracts as appropriate.

6. Imposes plumbing retrofit requirements if needed.

E. City Clerk:

1. Keeps copy of Standard Plumbing Code, Senate Bill 587, and any applicable standards referenced therein on hand for public inspection.
2. Keeps copy of adopted Water Conservation Plan on hand for public inspection.

F. City Building Official:

1. Inspects all normal plumbing installations.
2. Inspects all plumbing retrofit items required or voluntary installed in according to Plumbing Ordinance.

G. Water and Wastewater Superintendent, Personnel:

1. Implement universal metering.
2. Implement leak detection program, including use of electronic equipment; perform line repairs as needed.
3. Implement Education and Information Program.
4. Furnish information to Director of Public Works for annual report and also on frequent basis in order to exercise judgement in implementing water conservation program (*with possible assistance from engineering staff*).
5. Observe system operation and other factors (*with assistance from engineering staff in regard to certain parameters*) to determine when trigger conditions, and conversely conditions for downgrading and/or termination of emergencies), are occurring.
6. Implement (*usually at direction of Director of Public Works*) appropriate measures in response to trigger conditions or the end of such conditions.
7. Perform minor repairs to water system components as needed, or arrange for minor contract repairs.
8. Recommend major repairs to Director of Public Works (*sometimes in conjunction with engineering staff*).
9. Perform advance planning for emergencies as directed by Director of Public Works.
10. *With assistance of engineering staff*, perform monitoring of system operation for purpose

of determining need to modify trigger conditions.

11. Notify customers of water supply emergency in localized situations.

H. Engineering Staff:

1. Assist water department staff in providing information to Director of Public Works for annual report.
2. Assist water department staff in monitoring operating conditions (a) for detection of beginning or end of trigger conditions and (b) for verifying adequacy of trigger conditions.
3. Assist water department staff where appropriate in recommending major repairs.

EXHIBIT 15

**PROPOSED ORDINANCE ADOPTING
WATER CONSERVATION PROGRAM
INCLUDING
EMERGENCY DEMAND
MANAGEMENT PLAN**

ORDINANCE
ADOPTING WATER CONSERVATION PROGRAM,
INCLUDING EMERGENCY DEMAND MANAGEMENT PLAN

CITY OF XXXXXXXXX
XXXXXXXXXX COUNTY, TEXAS

WHEREAS, the City of XXXXXXXXX has applied for a loan commitment from the Texas Water Development Board to provide funding for participation in new regional water treatment and transportation facilities; and,

WHEREAS, one requirement of such loan commitment is that the City develop and adopt a program for water conservation and emergency demand management; and,

WHEREAS, the City of XXXXXXXXX has previously authorized Schaumburg & Polk, Inc. to prepare a Water Conservation Plan, including emergency demand management measures, to be submitted to the Texas Water Development Board; and,

WHEREAS, that Water Conservation Plan has been submitted to the Texas Water Development Board and approved subject to certain revisions; and,

WHEREAS, the City of XXXXXXXXX has enacted such ordinances and resolutions which are required at this time for the Water Conservation Program;

NOW, THEREFORE LET IT BE ORDAINED by the City Council of the City of XXXXXXXXX:

SECTION 1
ADOPTION OF PLAN

The City Council hereby approves and adopts the Water Conservation Plan, including emergency demand management measures, ordinances, resolutions, and exhibits, the text of which is on file at the City Clerk's office in the City of XXXXXXXXX and available for public inspection, as prepared by Schaumburg & Polk, Inc., previously submitted to the Texas Water Development Board and available for inspection at these Council meetings at which it is adopted. The City shall implement and enforce the program and will submit all necessary reports to the Texas Water Development Board.

SECTION 2
AVAILABILITY OF PLAN

The above referenced Water Conservation Plan shall be made available for public inspection in the City Clerk's office on a permanent basis and shall be plainly labelled as being the plan adopted by the City.

SECTION 3
IMPLEMENTATION

The City Manager shall be responsible for the overall implementation of the program, particularly including emergency demand management measures. In the event that measures requiring separate action by the City Council are found necessary, the City Manager shall be responsible for requesting a special or emergency Council meeting if necessary, and for presenting the matter to the Council for action.

Other City officials shall have responsibilities as prescribed in other ordinances or resolutions included in the Water Conservation Plan, or in the text of the plan.

SECTION 4
PENALTIES

Persons in violation of the ordinance shall be subject to one or more of the following penalties, as specified in the separate ordinances included in the Water Conservation Program:

1. Having a flow restricter placed on the violator's water service line at that person's expense.
2. Disconnection of any or all water and/or sanitary sewer services provided to the violator by the City.
3. Withholding of water and/or sanitary sewer service to newly constructed facilities.
4. A fine not to exceed \$200 per day per violation.

SECTION 5
VALIDITY

All ordinances or parts of ordinances in conflict herewith are hereby repealed. If any section or provision of this ordinance, or the application of same to any person or set of circumstances is invalidated or rendered unenforceable by a court of competent jurisdiction, such judgement shall not affect the validity of any remaining parts of the ordinance, which can be given effect without the invalidated part or parts, or their application to other persons or sets of circumstances.

SECTION 6
EFFECTIVE DATE

This Ordinance shall be in full force and effect with the _____ billing from and after final passage, approval, recording, and publication, as provided by law.

PASSED AND APPROVED on first reading this the ____ day of _____.

CITY OF XXXXXXXXX, XXXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

Approved as to Form:

Attorney for City

PASSED AND APPROVED on second and final reading this the ____ day of _____.

CITY OF XXXXXXXXX, XXXXXXXXX COUNTY, TEXAS

(City Seal)

ATTEST:

Secretary or Clerk

Mayor

EXHIBIT 16

**PROPOSED RESOLUTION FOR
EDUCATION AND INFORMATION PROGRAM**

RESOLUTION

Be it resolved by the City Council of the City of XXXXXXXXX that the Education and Information Program, as prescribed in Section II. A of the Water Conservation Plan as submitted previously to the Texas Water Development Board, will be carried out in the following manner and according to the following schedule:

- Manner:
- (a) Hand delivery of the specified materials to each customer, either alone or with the delivery of other items to the customer.
 - (b) Printed messages on the customer's monthly billing notices.

Schedule: No less than twice a year beginning with the closing of the Texas Water Development Board loan now applied for or pending, including at least once by manner (a) and the other time by manner (a) and (b) until all indebtedness to the Texas Water Development Board is paid in full, unless otherwise released by the Texas Water Development Board, with distribution periods selected so as to precede periods of high water usage.

New Customers: At time of application or connection.

(SEAL)

(Title)_____

Secretary or Clerk

Date: _____

EXHIBIT 17

**PROPOSED RESOLUTION FOR
MONITORING FOR TRIGGER CONDITIONS**

RESOLUTION

WHEREAS, in order to obtain a loan from the Texas Water Development Board (TWDB) for participation in new regional water treatment and transportation facilities, the City of XXXXXXXXX was required to submit a Water Conservation Plan to the TWDB; and,

WHEREAS, said Water Conservation Plan includes various emergency demand management measures for the City to implement in the event of actual or impending water shortages from various causes; and,

WHEREAS, said Water Conservation Plan also includes a set of guideline policies referred to as trigger conditions, which will result in action by the City Council and/or the City Manager, to declare an emergency and to take appropriate action;

WHEREAS, said guideline policies have been approved by the TWDB subject to certain modifications;

THEREFORE, BE IT RESOLVED by the City Council of the City of XXXXXXXXX:

1. The City hereby adopts said guidelines.
2. The City will monitor its water usage patterns, and if necessary parameters such as rates of water usage, water level in tanks, and/or pressures in distribution system, along with durations of such parameters, in order to verify the appropriateness of said guidelines.
3. The City will revise and/or supplement said guidelines as required on the basis of monitoring.
4. The City will use all due judgement in implementing emergency demand management measures.
5. The City will keep all necessary records of the actual use, if any, of emergency demand management measures.
6. The City will modify the guidelines as necessary on the basis of experience.

7. The City will, if appropriate, submit any revisions to the TWDB.

(Title) _____

(City Seal)

Secretary or Clerk

Date: _____