LOCAL GOVERNMENTS ENERGY MANAGEMENT PROGRAM REPORT

For

Laguna Madre Water District

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Port Isabel, Texas 78578

Administered By:

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Local Governments Energy Management Program

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1.0 EXECUTIVE SUMMARY

A preliminary on-site analysis of the Laguna Madre Water District (LMWD) was conducted for the purpose of identifying cost effective energy system retrofit projects. This report documents that analysis.

This service was provided at no cost to LMWD through the Local Government Energy Management Program as administered by the Texas Comptroller of Public Accounts, State Energy Conservation Office (SECO). This program promotes and encourages an active partnership between SECO and Local Governments for the purpose of planning, funding, and implementing energy saving measures, which will ultimately reduce facility energy bills.

The annual cost savings, implementation cost estimate and simple payback for all energy retrofit projects identified in this preliminary analysis are summarized below. Individual projects are summarized in Section 8.0 of this report.

Implementation Cost Estimate:	$716,000
Annual Energy Cost Savings:	$165,750
Simple Payback:	4.3 years

Recommendations and information of interest to LMWD is provided in this report regarding Energy Consumption and Performance (Section 3.0), Energy Accounting (Section 4.0), Senate Bill 12 and House Bill 3693 Overview (Section 5.0), Renewable Energy Technologies (Section 6.0), Recommended Maintenance and Operations Procedures (Section 7.0), Retrofit Opportunities (Section 8.0), Funding Options (Section 9.0), and Energy Management Policy (Section 10.0). A follow-up visit to LMWD will be scheduled to address any questions pertaining to this report, or any other aspect of this program.

SECO is committed to providing whatever assistance LMWD may require in planning, funding and implementing the recommendations of this report. The LMWD is encouraged to direct any questions or concerns to one of the following contact persons:

SECO / Mr. Stephen Ross
(512) 463-1770

SECO / Ms. Theresa Sifuentes
(512) 463-1896

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(512) 328-2533

2.0 FACILITY DESCRIPTIONS

This section provides a brief description of the facilities surveyed. The purpose of the onsite survey was to evaluate the major energy consuming equipment in each facility (i.e. Lighting, HVAC, and Controls Equipment).

Administration Building

Image Source: Microsoft® Virtual Earth™

Stories:	Single and Two story building
Area:	7,500 SF estimated
Bldg. Components:	Concrete and steel frame construction, masonry exterior, flat modified bitumen roof, slab on grade
Typical Lighting Fixtures:	T8 fluorescent fixtures with electronic ballasts
HVAC:	Split DX systems
Controls:	Standard Thermostats

Maintenance Office / Warehouse

Image Source: Microsoft® Virtual Earth™

Stories:	Single story building
Area:	8,000 SF estimated
Bldg. Components:	Metal frame, metal exterior, pitched metal roof, slab on grade
Typical Lighting Fixtures:	T8 fluorescent fixtures with electronic ballasts
HVAC:	Split DX systems
Controls:	Standard Thermostats

The purpose of the onsite survey was also to evaluate the major energy consuming equipment in each Water and Wastewater processing facility (i.e. pumps, motor, and processing equipment).

This section provides a brief description of the Laguna Madre Water and Wastewater processing facilities surveyed.

The Laguna Madre Water District (LMWD) operates water and wastewater utilities within and around the cities of Port Isabel and South Padre Island, Texas. The LMWD operates two (2) water treatment plants (WTP) and four (4) wastewater treatment plants (WWTP). The LMWD provides a surface water supply pumped from the Rio Grande River approximately 35 miles away.

The raw water pump station pumps water from the Rio Grande River into Surface Reservoir No. 4. The water is pumped again to the Las Cuates intermediate pump station and then is pumped again into surface Reservoir No. 3. Water is drawn out of this reservoir and pumped directly to Water Plant No. 2. Also, water is pumped from Surface Reservoir No. 3 to Surface Reservoir No. 1 where it is pumped directly into Water Treatment Plant No. 1.

Water Plant No. 1 is located just south of Port Isabel and is rated at 4.1 MGD. Water Plant No. 2 is located several miles west of Port Isabel along State Hwy. 100 and is rated at 5.0 MGD.

The Andy Bowie WWTP serves the northern parts of the City of South Padre Island. This WWTP is rated at 0.75 MGD and currently averages 0.45 MGD. The WWTP treats wastewater using the activated sludge process and coarse air bubble aeration.

The Isla Blanca WWTP serves the southern areas of the City of South Padre Island. This WWTP is rated at 2.6 MGD and currently averages 0.75 MGD. This WWTP treats wastewater using the activated sludge process and coarse air bubble aeration.

The Port Isabel WWTP serves the City of Port Isabel. This WWTP is rated at 1.1 MGD and currently averages 0.65 MGD. This WWTP treats wastewater using the activated sludge process and coarse air bubble aeration.

The Laguna Vista WWTP serves the Laguna Vista subdivision several miles west of Port Isabel. This WWTP is rated at 0.65 MGD and currently averages 0.25 MGD. The WWTP treats wastewater using the activated sludge process with Carrousel Mechanical Aeration.

3.0 ENERGY CONSUMPTION AND PERFORMANCE

During this assessment, 12 months of utility data was compiled to assess the energy consumption and performance of several of LMWD's facilities. The data analyzed comprised of approximately 50 electric utility accounts. Each utility account was grouped according to building or facility type. For example, several of the lift stations were grouped as a single account. Please see Appendix C for a complete summary of each account groups.

Annual electric and natural gas invoices for the utility data compiled were $746,091 for the 12-month period ending December 2007. A summary of annual utility costs is provided in Appendix C, Base Year Consumption History.

BUILDING - ENERGY PERFORMANCE INDICES

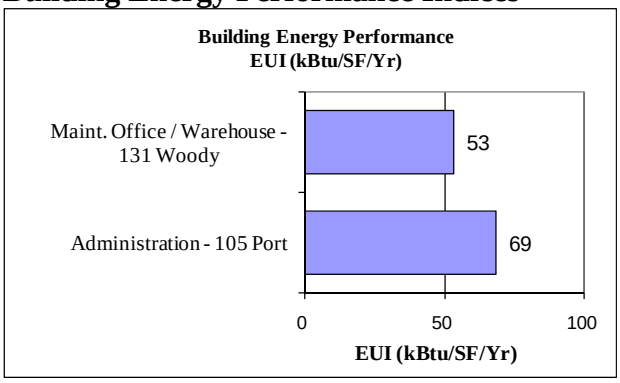
To help LMWD evaluate the overall energy performance of its building(s) TEESI has calculated their Energy Utilization Index (EUI) and Energy Cost Index (ECI). The EUI represents a facility's annual energy usage per square foot; it is measured as thousand BTU's per square foot per year (kBTU/SF/Year). Similarly, ECI is measured as cost per square foot per year ($/SF/Year). The EUI and ECI performance for the selected facilities is listed below.

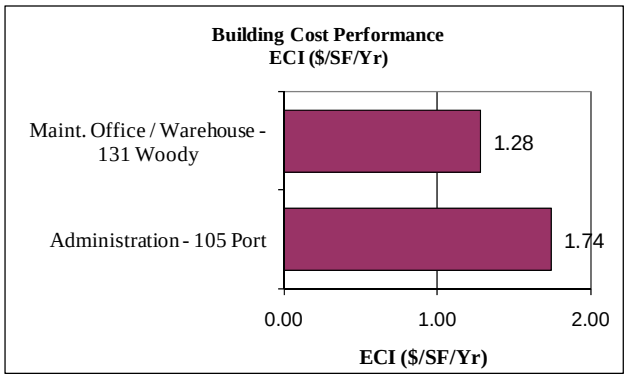
Buildings - Energy Cost and Cosumption Benchmarks

		Electric		Natural Gas		Total	Total	EUI	ECI	
	Building	KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF*
1	Administration - 105 Port	150,580	13,038	0	0	13,038	514	69	1.74	7,500
2	Maint. Office / Warehouse - 131 Woody	109,680	8,949	0	0	8,949	374	53	1.28	8,000
3	Truck Barn - Port Rd	3,145	277	0	0	277	11	N/A	N/A	N/A
		KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF*
		263,405	22,264	0	0	22,264	899	58	1.44	15,500

* Estimated

Building Energy Performance Indices





WASTEWATER TREATMENT PLANT (WWTP) - ENERGY PERFORMANCE INDICES

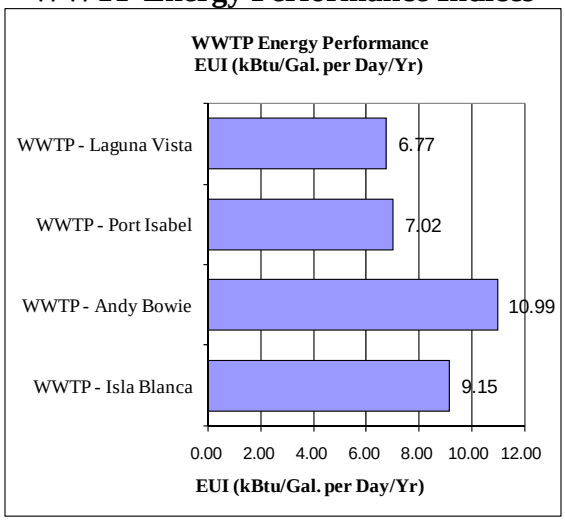
To help LMWD evaluate the overall energy performance of its WWTP TEESI has calculated their Energy Utilization Index (EUI) and Energy Cost Index (ECI). The EUI represents a plant's annual energy usage per existing average daily flow; it is measured as thousand BTU's per gallons per day (kBTU/Gal. per Day/Year). Similarly, ECI is measured as cost per gallons per day per year ($/Gal. per Day/Year). The EUI and ECI performance for four (4) WWTPs are listed below.

Wastewater Treatment Plant (WWTP) - Energy Cost and Cosumption Benchmarks

		Electric		Natural Gas		Total	Total	EUI*	Existing Average Daily Flow
	WWTP	KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/Gal. per Day/Yr	MGD
1	WWTP - Isla Blanca	2,011,776	168,490	0	0	168,490	6,866	9.15	0.75
2	WWTP - Andy Bowie	1,449,216	122,171	0	0	122,171	4,946	10.99	0.45
3	WWTP - Port Isabel	1,336,740	111,202	0	0	111,202	4,562	7.02	0.65
4	WWTP - Laguna Vista	495,600	37,614	0	0	37,614	1,691	6.77	0.25
		KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/Gal. per Day/Yr	MGD
		5,293,332	439,477	0	0	439,477	18,066	8.60	2.10

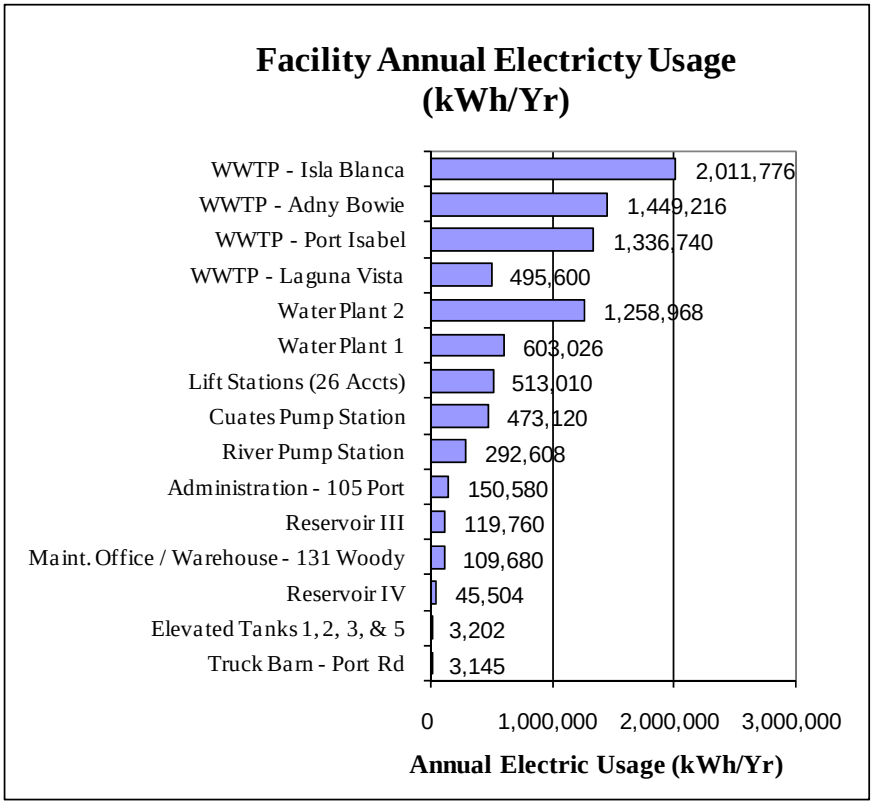
* Energy Use Index (EUI) = Annual Thousand BTUs Used per Existing Average Daily Flow (Gallons per Day)

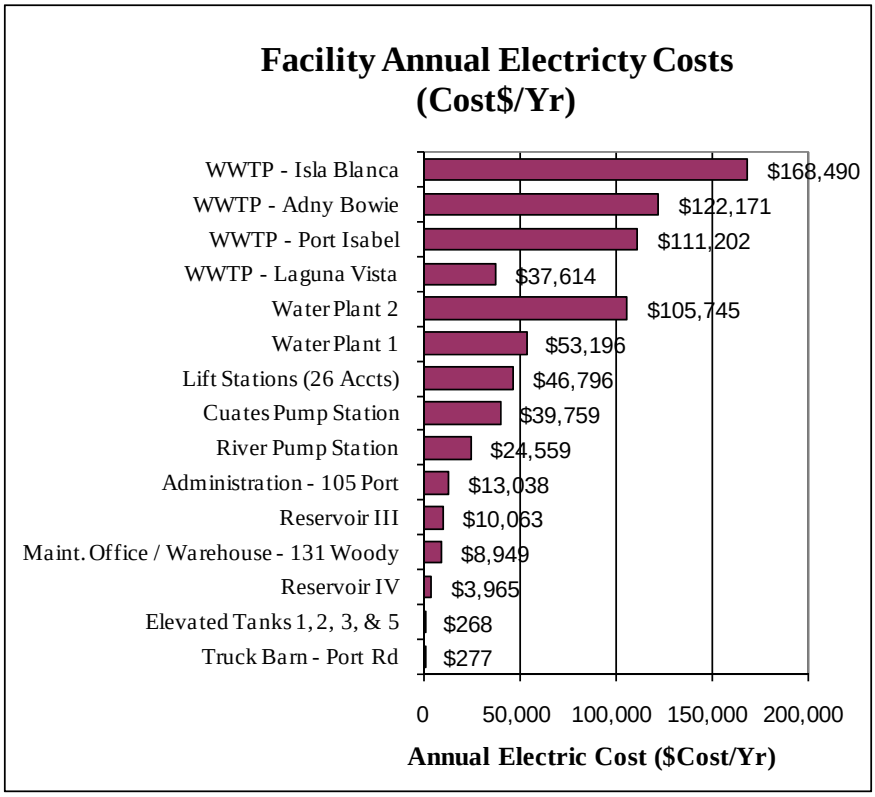
WWTP Energy Performance Indices



Knowing the EUI and ECI is useful to help determine the overall energy performance of the LMWDs facilities. Considering the no cost energy conservation measures and retrofits discussed in this report will help meet LMWD's annual energy reduction goals.

The following charts summarize the annual electric consumption (kWh) and electric cost ($) data presented in the previous tables. See appendix C for further detail.





4.0 ENERGY ACCOUNTING

UTILITY PROVIDERS

LMWD's facilities receive their electric service from Reliant Energy.

MONITORING AND TRACKING

An effective tracking system is an essential tool by which an energy management program's activities are monitored. The system should be centralized and available for all engaged staff members to use in verifying progress toward established targets, milestones, and deadlines.

Presently, LMWD tracks their utility data cost through its accounting software. LMWD should encourage routine monitoring (monthly) of their energy consumption (kWh, MCF, gallons, etc.) and cost to ensure an effective energy management program. This utility data monitoring procedure should be in an easily accessible electronic format. In addition, the data can be used track energy consumption and performance. For example, each facility's energy performance can be benchmarked and given an energy reduction goal. Periodic monitoring of each facilities performance will ensure each facility is on the right track to reach its goal.

LMWD may consider utilizing commercially available utility tracking software that can be tailored to meet LMWD's specific needs. LMWD can use this data to track utility consumption patterns and budget utility expenses. Having this historical data improves LMWD's awareness of their energy performance and will help in tracking energy reduction goals.

The Environment Protection Agency (EPA)'s EnergySTAR program has recently expanded their energy efficiency tools to include Water and Wastewater Treatment facilities. LMWD may benefit by utilizing this new EnergySTAR energy management tool specifically geared for Managers of drinking water systems and wastewater treatment plants. LMWD can track energy use, energy costs, and associated carbon emissions by using Portfolio Manager, EPA's online benchmarking tool. In addition, Portfolio Manager also offers wastewater treatment plant managers the ability to compare the energy use of their plants with other similar plants using the EPA energy performance rating system. Please follow the link below for further information regarding this free online energy management tool.

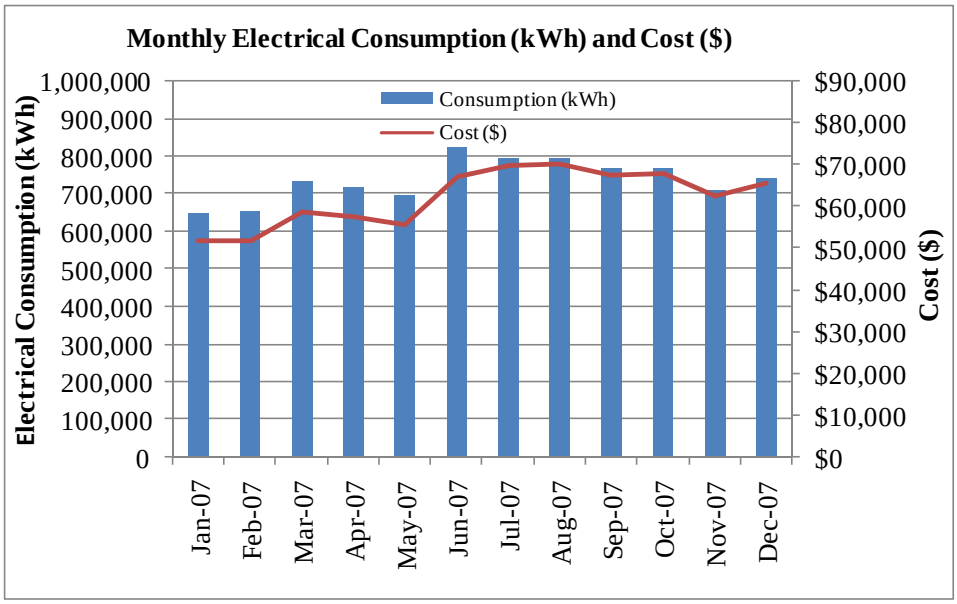
EnergySTAR Portfolio Manager
http://www.energystar.gov/index.cfm?c=government.wastewater_drinking_water

In addition, having this historical utility data would facilitate **House Bill 3693** and **Senate Bill 12** reporting requirements. Please see Section 5.0 for additional information regarding these requirements.

Furthermore, below is a sample format which LMWD can customize to help summarize their overall utility usage and costs.

The data presented below is a summation of the over hard-copy data provided by LMWD. The data below is a summation of approximately 50 electric utility accounts and is for reference purposes only and may not represent LMWD's total utility data. See Appendix C for further detail regarding each utility account represented in the table below.

MONTH	ELECTRICITY			NATURAL GAS			WATER		
	KWH	COST $	$/KWH	MCF	COST $	$/MCF	GAL	COST $	$/GAL
Jan-07	648,526	$51,695	$0.0797						
Feb-07	654,674	$51,851	$0.0792						
Mar-07	734,293	$58,638	$0.0799						
Apr-07	719,720	$57,744	$0.0802						
May-07	696,077	$55,858	$0.0802						
Jun-07	826,384	$67,062	$0.0812						
Jul-07	797,095	$69,744	$0.0875						
Aug-07	796,234	$70,215	$0.0882						
Sep-07	768,627	$67,561	$0.0879						
Oct-07	771,259	$67,864	$0.0880						
Nov-07	708,842	$62,405	$0.0880						
Dec-07	744,203	$65,455	$0.0880						
Total	8,865,935	$746,091	$0.0842						



5.0 SENATE BILL 12 AND HOUSE BILL 3693 OVERVIEW

In 2001, the 77th Texas Legislature passed Senate Bill 5 (SB5), also known as the Texas Emissions Reduction Plan, to amend the Texas Health and Safety Code. The legislation required ambitious, fundamental changes in energy use to help the state comply with federal Clean Air Act standards. It applied to all political subdivisions within 38 designated counties, later expanded to 41 counties.

In 2007, the 80th Texas Legislature passed Senate Bill 12 (SB 12) which among other things extended the timeline set in SB 5 for emission reductions. In the same period, the 80th Texas Legislature passed House Bill 3693 (HB 3693) which amended provisions of several codes relating primarily to energy efficiency.

The Bill requirements that are most relevant to this program are as follows:

Establish a goal of reducing electric consumption by five percent (5%) each state fiscal year for six (6) years, beginning on September 1, 2007.

Record electric, water, and natural gas utility services (consumption and cost) in an electronic repository. The recorded information shall be on a publicly accessible Internet Web site with an interface designed for ease of navigation if available, or at another publicly accessible location.

Energy-efficient light bulbs for buildings, requires an institution to purchase commercially available light bulbs using the lowest wattages for the required illumination levels.

Installation of energy saving devices in Vending Machines with non-perishable food products.

A summary description of SB 12 and HB 3693 is available in Appendix A. Further detail regarding each bill can be found in the Texas Legislature website (http://www.capitol.state.tx.us/Home.aspx).

6.0 RENEWABLE ENERGY TECHNOLOGIES

This section provides a general description of renewable energy technologies. The purpose of this sections it to provide the LMWD information on current renewable energy technologies. The District may elect to investigate the implementation and feasibility of the technologies listed below.

GREEN POWER

Electric Utility Providers offer "Green Power" grid-source renewable energy as a part of their energy portfolio. LMWD may elect to contact their electric utility provider to determine what types of "Green Power" energy plans are available. A good target to achieve is to purchase 35% of a building's total energy from renewable energy sources. Choosing to purchase these types of products helps reduce the air pollution impacts of electricity generation by relying on renewable energy sources such as solar, water, wind, biomass and geothermal sources. For further information regarding this type of energy, please visit the following website (Green-e Program www.green-e.org).

SOLAR PHOTOVOLTAIC (PV) PANELS

Texas is blessed with unlimited amount of solar energy supply, ranking first in the nation in solar resource potential. The map below is a general representation of which areas of the state receive the greatest amount of solar energy. The Texas Southern Gulf Cost offers good solar potential at 16,000 kWh/m^2/hr. Solar Photovoltaic (PV) Panels converts the suns energy into useful renewable electrical energy. Solar PV systems are identified by their peak power output (kW). A fully installed Solar PV system cost ranges between $7,500 - $10,000/kW. In South Texas, a 10kW system can save approximately $1,600/yr (based on $0.10/kWh). This system requires roughly 150sf/kW of available southern facing area. Therefore, a 10kW system would require 3,000 SF of free area. Applying utility rebates and incentives can help lower the initial investment cost. Smaller Solar PV can also be used to power small equipment (i.e. pumps) in remote locations.

Texas Solar Energy Intensity Map

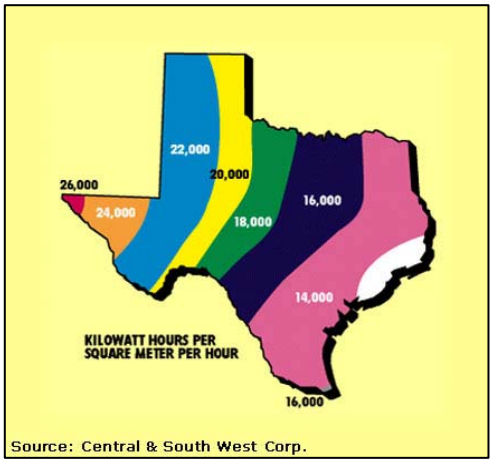


Image Source: SECO

Solar PV System Example

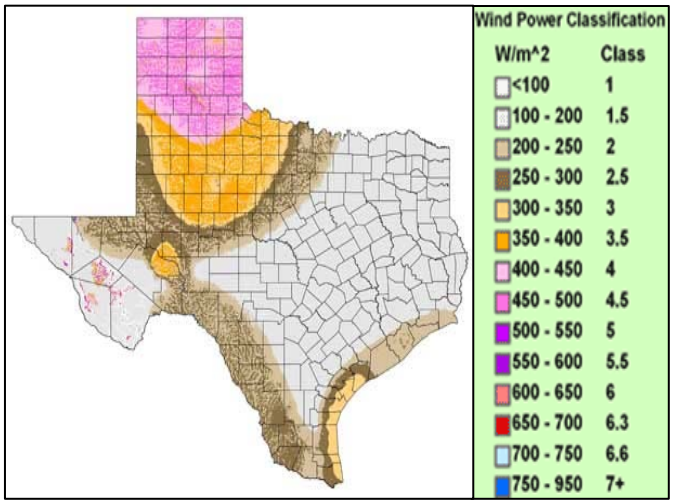
Image Source: Four Wind Renewable Energy

WIND ENERGY

The Texas Southern Gulf Coast is offers good wind energy opportunities. South of Galveston, the Texas coast experiences consistent strong sea breezes. The Texas Wind Power Map below indicates the LMWD area is in a Wind Power Class 3. Class 3 and above indicates the area can successfully accommodate small wind turbines. Small turbines with a capacity to generate less than 10 kilowatts of electricity are typically used to power small facilities and equipment in remote or off-grid locations. Small wind turbines have been used in rural areas for many years and in the past decade; there has been a dramatic rise in the use of these power systems as an alternative, affordable and reliable sources of electricity.

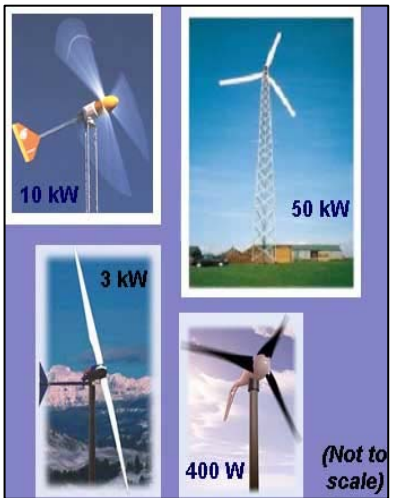
In general, a 10kW wind turbine can save approximately $2,000/yr in purchased electric energy based on $0.10/KWh. A 10kW system is suitable to supply energy for a facility which consumes on average 800/kWh per month. A fully installed small wind turbine system installed costs can range from $3,000 - $6,000/kW. Therefore, a 10kW system can cost up to $60,000. Variable such as available wind speed, mounting height, system efficiency and size affect the systems payback. Typical small wind turbine paybacks range from 15 to 25 years depending on system design and location. It is important that the system be well suited and designed for the specific application to ensure optimum performance.

Texas Wind Power Map



Source: SECO

Typical Wind Turbine Sizes



Source: American Wind Energy Association

7.0 RECOMMENDED MAINTENANCE & OPERATION PROCEDURES

Sound Maintenance and Operation procedures significantly improve annual utility costs, equipment life, and occupant comfort. Generally, maintenance and operation procedural improvements can be made with existing staff and budgetary levels. With this in mind, the following maintenance and operation procedures are recommended.

PUBLICIZE ENERGY CONSERVATION

Promote energy awareness at regular staff meetings, on bulletin boards, and through organizational publications. Publicize energy cost reports showing uptrends and downtrends.

INSTALL PROGRAMMABLE THERMOSTATS

Install programmable thermostats at the locations with standard non-programmable thermostats. Installing programmable thermostats will establish an operating schedule more suited to the occupancy patterns of the building. At minimum the programmable thermostat should have the following system features: 7 day scheduling, holiday scheduling, push button override (1-2 hrs), and unoccupied temperature settings.

OPTIMIZE SCHEDULING AND SETTING OF HVAC SYSTEMS

It is strongly recommended that persistent monitoring of occupancy patterns and scheduling thermostats accordingly will help reduce the equipment runtime. In addition, establishing a uniform temperature set-point throughout buildings will help reduce the HVAC energy usage. An established uniform building set-point will help remind staff members of their role to help reduce the overall annual energy consumption.

REPLACE INCANDESCENT LAMPS WITH COMPACT FLUORESCENTS

Replace existing incandescent lamps with compact fluorescent lamps (CFLs) as they burn out. Compact fluorescents use 50 to 75 percent less wattage for the same light output, with ten times the operating life of incandescents.

INSTALLATION OF OCCUPANCY SENSORS FOR INDOOR LIGHTING CONTROL

Installing occupancy sensors to improve control of interior lighting will help improve lighting control. Occupancy sensors will help ensure lights are only on when the space is occupied. There are several commercially available occupancy sensor technologies such as Infrared, Ultrasonic and Dual Technology. It is important the appropriate sensor technology and sensor location is installed to ensure optimum performance. In general, enclosed areas with intermittent use, are typically good candidates for occupancy sensors (i.e. restrooms, conference rooms, break rooms, etc.).

ESTABLISH HVAC UNIT SERVICE SCHEDULES

Document schedules and review requirements for replacing filters, cleaning condensers, and cleaning evaporators. Include particulars such as filter sizes, crew scheduling, contract availability if needed, etc. Replace filters with standard efficiency pleated units. Generally, appropriate service frequencies are as follows -- filters: monthly; condensers: annually; evaporators: 5 years.

REPLACE T8 FLUORESCENT LAMPS WITH LOWER WATTAGE LAMPS

Low-wattage T8 fluorescent lamps are available in 30, 28 and 25-watt versions. If applicable, replacing existing 32-watt T8 Fluorescent lamps with lower wattage lamps would reduce energy use. Changing to a lower wattage T8 Lamp is a relatively straightforward process however, lower wattage T8 lamps do have limitations and are only suitable for certain applications. Lower wattage T8 lamps have reduced lighting levels therefore, it is important to ensure recommended lighting levels are maintained. Lighting levels should be verified prior to and after lamp replacement. In addition, compatibility with existing ballasts, local codes and other requirements must be verified prior to retrofitting. Nevertheless, if suitable for the application, switching to lower wattage T8 lamps will have sustainable energy savings with minimal impact. For example, replacing a 32-watt T8 lamp with a 28-watt T8 lamp will approximately have a 12% lighting energy reduction with only a lighting level drop near 4%. Where T8 Lamps present, replacement should be considered for areas such as corridors, rest rooms, storage rooms, and other areas that may accommodate lower wattage lamps.

INSTALL ENERGY SAVING DEVICES ON VENDING MACHINE

Install energy saving devices on vending machines with non-perishable food items to reduce the equipment power usage. These devices shut the vending machines down during unoccupied periods. Several commercially available devices can be easily installed on existing vending machines. These devices typical have a motion sensor that power down the equipment after periods of inactivity. For example if the motion sensor does not sense activity within 15 minutes the device will shutdown the vending machine and turn on once motion is sensed. These devices range in price from $100 to $250 and have a typical annual savings of $20 to $150 per vending machine.

ENERGY STAR POWER MANAGEMENT

ENERGY STAR Power Management Program promotes placing monitors and computers (CPU, hard drive, etc.) into a low-power “sleep mode” after a period of inactivity. The estimated annual savings can range from $25 to $75 per computer. ENERGY STAR recommends setting computers to enter system standby or hibernation after 30 to 60 minutes of inactivity. Simply touching the mouse or keyboard “wakes” the computer and monitor in seconds. Activating sleep features saves energy, money, and helps protect the environment.

IMPROVE CONTROL OF INTERIOR & EXTERIOR LIGHTING

Establish procedures to monitor use of lighting at times and places of possible/probable unnecessary use: Offices at lunchtime, closets, parking lots during daylight hours, etc. One or two friendly reminders for minor infractions will usually result in lower electric bills.

CONTROL OUTSIDE AIR INFILTRATION

Conduct periodic inspections of door and window weather-stripping, and schedule repairs when needed. Additionally, make sure doors and windows are closed during operation of HVAC systems (heating or cooling). Unintended outside air contributes to higher energy consumption, shorter equipment life, and occupant discomfort.

WATER AND WASTEWATER PROCESSING FACILITIES

The following recommendations are general recommendations specific to Water and Wastewater processing facilities.

UTILIZE HIGH EFFICIENCY PUMPS AND MOTORS

When replacing pumping units, procure high efficiency pumps and motors. Energy savings could account for 10-15% difference when compared to existing units.

EVALUATE PIPE SIZING WITHIN SERVICE AREA TO REDUCE FRICTION LOSSES

Performing a water distribution system analysis can recommend the most efficient piping size for the service area. Constructing non-restrictive piping would reduce system head requirements and save power.

ADD VFD OR "SOFT-START" TO PUMPING UNITS 50 HP AND GREATER

A soft-start feature would reduce start-up amperage surcharge saving money when rate structures take start-up amperage draw into account.

CONTROL DISSOLVED OXYGEN LEVEL IN WWTP

Reducing aeration to maintain dissolved oxygen levels of 2.0 mg/l or less could reduce power draw. Adjusting air inlet control valves or utilizing Variable Frequency Drive or dual speed motors, or simply operating fewer units to maintain minimum dissolved oxygen levels will save power.

UTILIZE EFFICIENT AERATION METHOD IN WASTEWATER TREATMENT

Using efficient aeration methods in wastewater treatment can save 40-50% in power consumption. Coarse bubble aeration is generally the least efficient type of aeration used in wastewater treatment. More efficient methods include fine bubble aeration and mechanical surface aeration.

8.0 RETROFIT OPPORTUNITIES

Energy retrofit projects identified during the preliminary analysis are detailed below. Project cost estimates include complete design and construction management services.

REPLACE COARSE BUBBLE DIFFUSERS WITH FINE BUBBLE DIFFUSERS

Replace the existing coarse bubble diffusers with fine bubble diffusers in the activated sludge treatment basins. This retrofit could save up to 40% of the total power consumption of the activated sludge process, and increase treatment efficiency.

COARSE TO FINE BUBBLE DIFFUSION			
Facility	**Estimated Implementation Cost**	**Estimated Annual Savings**	**Payback (years)**
WWTP - Andy Bowie	$85,000	$45,000	1.9
WWTP - Isla Blanca	$286,000	$51,000	5.6
WWTP - Port Isabel	$125,000	$34,000	3.7
TOTAL	**$496,000**	**$130,000**	**3.8**

WWTP DISSOLVED OXYGEN

Monitoring dissolved oxygen in aeration basins can be a big energy saving operation. Aeration basins often are operated at dissolved oxygen levels of 3.0 – 4.0 mg/l. By operating at dissolved oxygen levels of 0.5 mg/l to 2.0 mg/l, treatment can be maintained and power savings can be achieved at a rate of about $1,000 per MGD treated per mg/l DO. reduced.

DISSOLVED OXYGEN MONITORING			
Facility	**Estimated Implementation Cost**	**Estimated Annual Savings**	**Payback (years)**
WWTP - Andy Bowie	$5,000	$1,400	3.6
WWTP - Isla Blanca	$5,000	$2,300	2.2
WWTP - Laguna Vista	$5,000	$750	6.7
WWTP - Port Isabel	$5,000	$1,300	3.8
TOTAL	**$20,000**	**$5,750**	**3.5**

VFD INSTALLATION ON HIGH SERVICE PUMPS

Install Variable Frequency Drives (VFDs) on four (4) 100 HP high services pumps found at Water Treatment Plants 1 & 2. The VFDs will help reduce full voltage starting amperage and allow the pumps to vary according to system demand. In addition, the VFDs will allow the elevated storage tanks to be taken out of service for maintenance, repairs, and painting.

VFD INSTALLATION			
Facility	**Estimated Implementation Cost**	**Estimated Annual Savings**	**Payback (years)**
Water Plant 1	$50,000	$5,000	10.0
Water Plant 2	$50,000	$5,000	10.0
TOTAL	**$100,000**	**$10,000**	**10.0**

RAW WATER DISTRIBUTION LINE REPAIRS

The 35 miles of water line between the river and the service areas appears to have an excessive leakage rate. This water line should be pressure tested, inspected, and repaired. The cost of pumping water that is lost to leakage is estimated at 10¢ per 1,000 gallons. If 10% of all water pumped from the Rio Grande to the Laguna Madre Water District is lost to leakage, this cost would total about $15,000 to $20,000 annually. The estimated cost and savings noted below are based on preliminary observations. Exact cost and quantities and be indentified during a detailed energy assessment.

RAW WATER DISTRIBUTION REPAIR			
Facility	**Estimated Implementation Cost**	**Estimated Annual Savings**	**Payback (years)**
Cuates Pump Station	$100,000	$20,000	5.0
TOTAL	**$100,000**	**$20,000**	**5.0**

The following table summarizes the implementation costs, annual savings and payback for the above projects:

SUMMARY OF ENERGY COST REDUCTION MEASURES			
Project Description	**Estimated Implementation Cost**	**Estimated Annual Savings**	**Payback (years)**
COARSE TO FINE BUBBLE DIFFUSION	$496,000	$130,000	3.8
DISSOLVED OXYGEN MONITORING	$20,000	$5,750	3.5
VFD INSTALLATION	$100,000	$10,000	10.0
RAW WATER DISTRIBUTION REPAIR	$100,000	$20,000	5.0
TOTAL:	**$716,000**	**$165,750**	**4.3**

The above project implementation costs and annual savings are estimated based on a preliminary examination of the facilities. Final costs will be determined from detailed building assessments, engineering calculations, and contractor estimates.

Project design (drawings and specifications), if authorized, would normally be accomplished by professional engineers. Project acquisition (competitive bidding) would be in accordance with District requirements, and construction management would be provided by the engineering group who prepared the drawings and specifications.

9.0 FUNDING OPTIONS FOR CAPITAL ENERGY PROJECTS

Institutional organizations have traditionally tapped bond money, maintenance dollars, or federal grants to fund energy-efficient equipment change outs or additions such as energy-efficient lighting systems, high efficiency air conditioning units, and computerized energy management control systems. Today a broader range of funding options are available. A number of these are listed below.

TEXAS LOANSTAR PROGRAM

The LoanSTAR (Saving Taxes and Resources) Program, which is administered by the State Energy Conservation Office, finances energy-efficient building retrofits with a typical interest rate of 3 percent. The program's revolving loan mechanism allows borrowers to repay loans through the stream of cost savings realized from the projects. Projects financed by LoanSTAR must have an average simple payback of ten years or less and must be analyzed in an Energy Assessment Report by a Professional Engineer. Upon final loan execution LMWD proceeds to implement funded projects through the traditional bid/specification process. Contact: Theresa Sifuentes (512/463-1896).

INTERNAL FINANCING

Improvements can be paid for by direct allocations of revenues from an organization's currently available operating or capital funds. The use of internal financing normally requires the inclusion and approval of energy-efficiency projects within an organization's annual operating and capital budget-setting process. Often, small projects with high rate of return can be scheduled for implementation during the budget year for which they are approved. Large projects can be scheduled for implementation over the full time period during which the capital budgets is in place. Budget constraints, competition among alternative investments, and the need for higher rates of return can significantly limit the number of internally financed energy-efficiency improvements.

PRIVATE LENDING INSTITUTIONS OR LEASING CORPORATIONS

Banks, leasing corporations, and other private lenders have become increasingly interested in the energy efficiency market. The financing vehicle frequently used by these entities is a municipal lease. Structured like a simple loan, a municipal leasing agreement is usually a lease-purchase arrangement. Ownership of the financed equipment passes to the LMWD at the beginning of the lease, and the lessor retains a security interest in the purchase until the loan is paid off. A typical lease covers the total cost of the equipment and may include installation costs. At the end of the contract period, the lessee pays a nominal amount, usually a dollar, for title to the equipment.

PERFORMANCE CONTRACTING WITH AN ENERGY SERVICE COMPANY

Through this arrangement, an energy service company (ESCO) uses third party financing to implement a comprehensive package of energy management retrofits for a facility. This turnkey service includes an initial assessment by the contractor to determine the energy-saving potential for a facility, design work for identified projects, purchase and installation of equipment, and overall project management. The ESCO guarantees that the cost savings generated by the projects will, at a minimum, cover the annual payment due to the ESCO over the term of the contract.

UTILITY SPONSORED ENERGY EFFICIENCY INCENTIVE PROGRAMS

Many of the State's utilities offer energy efficiency incentive programs to offset a portion of the upfront cost associated with energy efficiency measures. The program requirements and incentives range from utility to utility. For example, CenterPoint Energy provides incentives for efficiency measures such as installation of high efficiency equipment, lighting upgrades, and building commissioning. These energy efficiency programs' incentives typically cover $0.06/kWh and $175/kW of verifiable energy and demand reductions, respectively. For further information, contact your utility provider to determine what programs are available in your area.

10.0 ENERGY MANAGEMENT POLICY

At present, LMWD has not adopted a comprehensive energy management policy. LMWD is committed to improving their energy performance and this is evident by the request to perform a Preliminary Energy Assessment. However, in order to ensure and sustain long-term energy efficient practices a comprehensive Energy Management Policy should be adopted by LMWD.

A District-wide energy management plan adopted by the governing board sends a strong signal that energy management is an institutional priority. At a minimum, the energy management plan should address the following:

- Establish an energy steering committee to review energy cost and consumption on a regular basis.
- Outline energy cost reduction measures and implementation strategies.
- Assign energy manager duties to existing staff positions, with defined roles and responsibilities.
- Establish acceptable equipment operating parameters and schedules, such as HVAC space heating and cooling set points, availability and duration of overrides, etc.
- Promote awareness of energy conservation by publishing goals and progress of energy conservation measures.
- Establishment of a tracking method for utility cost and consumption.

To help LMWD develop such a document a sample Energy Management Policy has been included in Appendix H. This document is intended to be used as a template, which can be tailored to meet LMWD's specific needs. In addition, as supplement to the policy, a Water Efficiency Guideline developed by SECO has been included in Appendix I

11.0 ANALYST IDENTIFICATION

Texas Energy Engineering Services, Inc.
Capital View Center, Suite B-325
1301 Capital of Texas Highway
Austin, Texas 78746
(512) 328-2533

M. Saleem Khan, P.E.
Robert Thonhoff, P.E.
David Rocha, LEED-AP

APPENDICES

APPENDIX A

SENATE BILL 12 AND HOUSE BILL 3693 SUMMARY

How to comply with SB12 & HB 3693

What you need to know about Texas Senate Bill 12

The passage of Senate Bill 12 (SB12) by the 80th Texas Legislature signified the continuance of Senate Bill 5 (SB5), the 77th Texas Legislature's sweeping approach in 2001 to clean air and encourage energy efficiency in Texas. SB12 was enacted on September 1, 2007 and was crafted to continue to assist the state and its political jurisdictions to conform to the standards set forth in the Federal Clean Air Act. The bill contains energy-efficiency strategies intended to decrease energy consumption while improving air quality.

All political subdivisions in the 41 non-attainment or near non-attainment counties in Texas are required to:

*1) Adopt a goal to reduce electric consumption by 5 percent each year for six years, beginning September 1, 2007**

2) Implement all cost-effective energy-efficiency measures to reduce electric consumption by existing facilities. (Cost effectiveness is interpreted by this legislation to provide a 20 year return on investment.)

3) Report annually to the State Energy Conservation Office (SECO) on the entity's progress, efforts and consumption data.

*Note: The recommended baseline data for those reporting entities will consist of the jurisdiction's 2006 energy consumption for its facilities and based on the State Fiscal Year (September 1, 2006 to August 31, 2007).

What you need to know about Texas House Bill 3693

The passage of House Bill 3693 (HB3693) by the 80th Texas Legislature is intended to provide additional provisions for energy-efficiency in Texas. Adopted with an effective date of September 1, 2007, HB 3693 is an additional mechanism by which the state can encourage energy-efficiency through various means for School Districts, State Facilities and Political Jurisdictions in Texas.

HB 3693 includes the following state-wide mandates that apply differently according to the nature and origin of the entity:

Record, Report and Display Consumption Data
All Political Subdivisions, School Districts and State-Funded Institutes of Higher Education, are mandated to record and report the entity's metered resource consumption usage data for electricity, natural gas and water on a publically accessible internet page.
Note: The format, content and display of this information are determined by the entity or subdivision providing this information.

Energy Efficient Light Bulbs
All School Districts and State-Funded Institutes of Higher Education shall purchase and use energy-efficient light bulbs in education and housing facilities.

Who must comply?
The provisions in this bill will apply to entities including: Cities and Counties; School Districts; Institutes of Higher Education; State Facilities and Buildings.

How do you define energy-efficiency measures?

Energy-efficiency measures are defined as any facility modifications or changes in operations that reduce energy consumption. Energy-efficiency is a strategy that has the potential to conserve resources, save money** and better the quality of our air. They provide immediate savings and add minimal costs to your project budget.

Examples of energy-efficiency measures include:

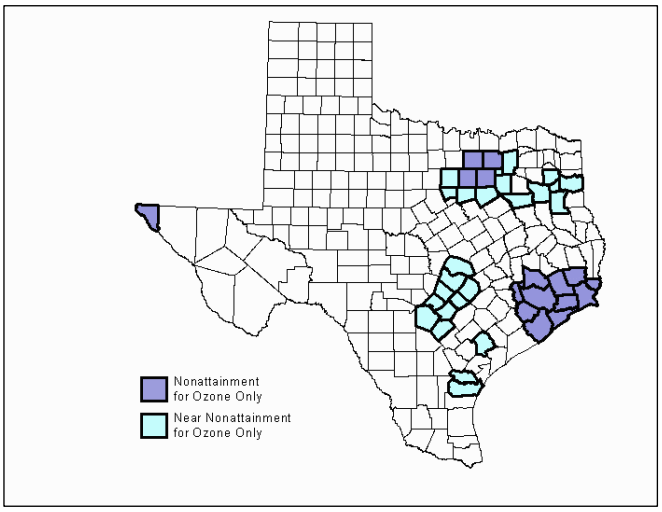
• installation of insulation and high-efficiency windows and doors • modifications or replacement of HVAC systems, lighting fixtures and electrical systems • installation of automatic energy control systems • installation of energy recovery systems or renewable energy generation equipment • building commissioning • development of energy efficient procurement specifications • employee awareness campaigns

***SECO's Preliminary Energy Assessment (PEA) program is an excellent resource for uncovering those energy-efficiency measures that can benefit your organization.*

What counties are affected?

All political jurisdictions located in the following
Non-attainment and affected counties:

Bastrop Bexar Brazoria Caldwell Chambers Collin Comal Dallas Denton El Paso Ellis Fort Bend Galveston Gregg Guadalupe Hardin Harris Harrison Hays Henderson Hood Hunt Jefferson Johnson Kaufman Liberty Montgomery Nueces Orange Parker Rockwall Rusk San Patricio Smith Tarrant Travis Upshur Victoria Waller Williamson Wilson



What assistance is available for affected areas?

The Texas Energy Partnership is a partner with Energy Star©, who partners across the nation with the goal of improving building performance, reducing air emissions through reduced energy demand, and enhancing the quality of life through energy-efficiency and renewable energy technologies.

To assist jurisdictions, the Texas Energy Partnership will:

- Present workshops and training seminars in partnership with private industry on a range of topics that include energy services, financing, building technologies and energy performance rating and benchmarking

- Prepare information packages – containing flyers, documents and national lab reports about energy services, management tools and national, state and industry resources that will help communities throughout the region

- Launch an electronic newsletter to provide continuous updates and develop additional information packages as needed

Please contact Stephen Ross at 512-463-1770 for more information.

SECO Program Contact Information

LoanSTAR;
Preliminary Energy Assessments:
Theresa Sifuentes - 512-463-1896
Theresa.Sifuentes@cpa.state.tx.us

Schools Partnership Program:
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Engineering (Codes / Standards):
Felix Lopez - 512-463-1080
Felix.Lopez@cpa.state.tx.us

Innovative / Renewable Energy:
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Energy / Housing
Partnership Programs:
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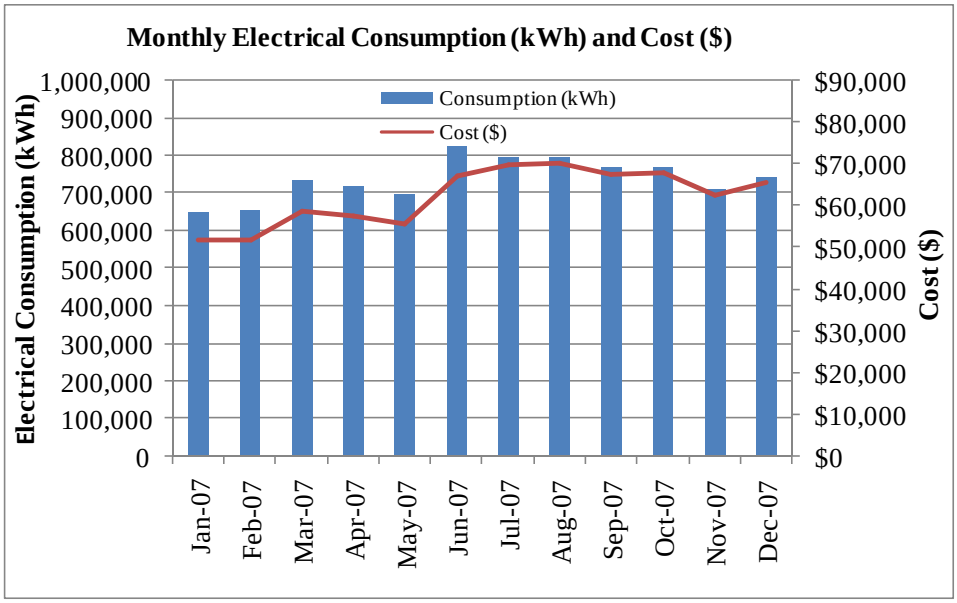
Stephen.Ross@cpa.state.tx.us

Alternate Fuels / Transportation:
Mary-Jo Rowan - 512-463-2637
Mary-Jo.Rowan@cpa.state.tx.us

APPENDIX B

SAMPLE UTILITY INPUT FORM

MONTH	ELECTRICITY			NATURAL GAS			WATER		
	KWH	COST $	$/KWH	MCF	COST $	$/MCF	GAL	COST $	$/GAL
Jan-07	648,526	$51,695	$0.0797						
Feb-07	654,674	$51,851	$0.0792						
Mar-07	734,293	$58,638	$0.0799						
Apr-07	719,720	$57,744	$0.0802						
May-07	696,077	$55,858	$0.0802						
Jun-07	826,384	$67,062	$0.0812						
Jul-07	797,095	$69,744	$0.0875						
Aug-07	796,234	$70,215	$0.0882						
Sep-07	768,627	$67,561	$0.0879						
Oct-07	771,259	$67,864	$0.0880						
Nov-07	708,842	$62,405	$0.0880						
Dec-07	744,203	$65,455	$0.0880						
Total	8,865,935	$746,091	$0.0842						



APPENDIX C

BASE YEAR CONSUMPTION HISTORY

Buildings - Energy Cost and Cosumption Benchmarks										
		Electric		Natural Gas		Total	Total	EUI	ECI	
	Building	KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF*
1	Administration - 105 Port	150,580	13,038	0	0	13,038	514	69	1.74	7,500
2	Maint. Office / Warehouse - 131 Woody	109,680	8,949	0	0	8,949	374	53	1.28	8,000
3	Truck Barn - Port Rd	3,145	277	0	0	277	11	N/A	N/A	N/A
		KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF*
		263,405	22,264	0	0	22,264	899	58	1.44	15,500

* Estimated

Wastewater Treatment Plant (WWTP) - Energy Cost and Cosumption Benchmarks									
		Electric		Natural Gas		Total	Total	EUI*	Existing Average Daily Flow
	WWTP	KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/Gal. per Day/Yr	MGD
1	WWTP - Isla Blanca	2,011,776	168,490	0	0	168,490	6,866	9.15	0.75
2	WWTP - Andy Bowie	1,449,216	122,171	0	0	122,171	4,946	10.99	0.45
3	WWTP - Port Isabel	1,336,740	111,202	0	0	111,202	4,562	7.02	0.65
4	WWTP - Laguna Vista	495,600	37,614	0	0	37,614	1,691	6.77	0.25
		KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/Gal. per Day/Yr	MGD
		5,293,332	439,477	0	0	439,477	18,066	8.60	2.10

* Energy Use Index (EUI) = Annual Thousand BTUs Used per Existing Average Daily Flow (Gallons per Day)

Water Processing Facilities - Energy Cost and Cosumption Benchmarks							
		Electric		Natural Gas		Total	Total
	WWTP	KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr
1	Water Plant 2	1,258,968	105,745	0	0	105,745	4,297
2	Water Plant 1	603,026	53,196	0	0	53,196	2,058
3	Lift Stations (26 Accts)	513,010	46,796	0	0	46,796	1,751
4	Cuates Pump Station	473,120	39,759	0	0	39,759	1,615
5	River Pump Station	292,608	24,559	0	0	24,559	999
6	Reservoir III	119,760	10,063	0	0	10,063	409
7	Reservoir IV	45,504	3,965	0	0	3,965	155
8	Elevated Tanks 1, 2, 3, & 5	3,202	268	0	0	268	11
		KWH/Yr	$Cost/Yr	MCF/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr
		3,309,198	284,350	0	0	284,350	11,294

10032789424380510 / 2797400
10032789473063271 / 2797410
ACCOUNT# 10032789473063272 / 2797411 Electric
Gas

Water District: Laguna Madre

BUILDING: Administration - 105 Port

FLOOR AREA: 7,500 estimated

		Electrical					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	9,166		69		719		
February	2007	9,897		65		773		
March	2007	9,775		57		798		
April	2007	11,341		42		926		
May	2007	12,083		37		985		
June	2007	14,998		43		1,227		
July	2007	17,810		45		1,634		
August	2007	15,305		44		1,404		
September	2007	15,081		45		1,373		
October	2007	14,143		45		1,289		
November	2007	11,645		43		1,062		
December	2007	9,336		39		848		
TOTAL		150,580				13,038		

Annual Total Energy Cost = 13,038 $/year

Total KWH/yr x 0.003413 = 513.93 MMBTU/year
Total MCF/yr x 1.03 = 0.00 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 514 MMBTU/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 69 kBTU/SF/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.74 $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789403536058 / 3430179 Electric

Gas

BUILDING: Maint. Office / Warehouse - 131 Woody

FLOOR AREA: 7,000 Estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	6,360		25		525		
February	2007	7,880		31		638		
March	2007	6,400		26		513		
April	2007	7,680		32		615		
May	2007	7,960		26		618		
June	2007	10,680		32		840		
July	2007	12,720		32		1,024		
August	2007	11,120		32		929		
September	2007	11,600		31		955		
October	2007	11,080		31		916		
November	2007	8,880		30		749		
December	2007	7,320		27		626		
TOTAL		109,680				8,949		

Annual Total Energy Cost = 8,949 $/year

Total KWH/yr x 0.003413 = 374.34 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 374 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = 53 kBTU/SF/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = 1.28 $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789441624600 / 2797412 Electric

Gas

BUILDING: Truck Barn - Port Rd

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	152		1		12		
February	2007	46		1		4		
March	2007	58		1		5		
April	2007	119		1		10		
May	2007	196		1		16		
June	2007	360		1		30		
July	2007	464		1		43		
August	2007	398		1		37		
September	2007	422		1		38		
October	2007	445		1		41		
November	2007	313		1		29		
December	2007	172		1		16		
TOTAL		3,145		12		277		

Annual Total Energy Cost = 277 $/year

Total KWH/yr x 0.003413 = 10.73 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 11 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789404911700 / 2797372 Electric

Gas

Existing Average

BUILDING: WWTP - Isla Blanca

Daily Flow (MGD): 0.75

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	163,392		243		12,872		
February	2007	165,504		270		12,947		
March	2007	153,984		262		12,247		
April	2007	166,752		257		13,262		
May	2007	157,152		250		12,499		
June	2007	181,728		275		14,636		
July	2007	166,752		260		14,538		
August	2007	175,680		310		15,509		
September	2007	187,968		317		16,559		
October	2007	175,296		313		15,443		
November	2007	148,128		254		13,050		
December	2007	169,440		241		14,928		
TOTAL		2,011,776				168,490		

Energy Use Index: kBTU/Gal. per

Annual Total Energy Cost = 168,490 $/year

Total site kBTU's/Yr ÷ Gal. per Day = 9.15 Day/year

Total KWH/yr x 0.003413 = 6,866.19 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 6,866 MMBTU/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 1003279407345070 / 2797360 Electric

Gas

Existing Average

BUILDING: WWTP - Andy Bowie

Daily Flow (MGD): 0.45

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	113,856		172		8,969		
February	2007	105,408		169		8,246		
March	2007	108,096		155		8,597		
April	2007	96,192		155		7,650		
May	2007	92,736		144		7,376		
June	2007	105,408		180		8,503		
July	2007	125,184		187		10,931		
August	2007	127,104		216		11,221		
September	2007	141,120		210		12,432		
October	2007	148,992		219		13,126		
November	2007	141,696		226		12,483		
December	2007	143,424		234		12,636		
TOTAL		1,449,216				122,171		

Energy Use Index: kBTU/Gal. per Day/year

Annual Total Energy Cost = 122,171 $/year

Total site kBTU's/Yr ÷ Gal. per Day = 10.99

Total KWH/yr x 0.003413 = 4,946.17 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 4,946 MMBTU/year

Electric Utility: Reliant

Gas Utility: N/A

ACCOUNT# 10032789418554891 / 2797399 Electric
10032789418554892 / 2797397 Gas

BUILDING: WWTP - Port Isabel

Water District: Laguna Madre

Existing Average Daily Flow (MGD): 0.65

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	115,625		204	0	9,109	0	0
February	2007	129,465		204	0	10,128	0	0
March	2007	127,345		199	0	10,128	0	0
April	2007	126,225		193	0	10,039	0	0
May	2007	121,345		199	0	9,651	0	0
June	2007	120,705		196	0	9,730	0	0
July	2007	106,225		140	0	9,247	0	0
August	2007	96,545		182	0	8,523	0	0
September	2007	63,145		384	0	5,563	0	0
October	2007	123,265		180	0	10,860	0	0
November	2007	103,905		150	0	9,154	0	0
December	2007	102,945		156	0	9,070	0	0
TOTAL		1,336,740		2387	0.00	111,202	0.0	0

Annual Total Energy Cost = 111,202 $/year

Energy Use Index: Total site kBTU's/Yr ÷ Gal. per Day = 7.02 kBTU/Gal. per Day/year

Total KWH/yr x 0.003413 = 4,562.29 MMBTU/year
Total MCF/yr x 1.03 = 0.00 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 4,562 MMBTU/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789498559338 / 4475499 Electric

Gas

Existing Average

BUILDING: WWTP - Laguna Vista

Daily Flow (MGD): 0.25

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	40,400		66		2,953		
February	2007	34,640		59		2,555		
March	2007	39,840		59		2,879		
April	2007	38,640		63		2,798		
May	2007	38,640		62		2,798		
June	2007	55,440		80		4,019		
July	2007	50,640		76		3,949		
August	2007	36,720		72		2,957		
September	2007	41,520		60		3,276		
October	2007	37,600		61		2,986		
November	2007	38,480		64		3,051		
December	2007	43,040		66		3,394		
TOTAL		495,600				37,614		

Energy Use Index: kBTU/Gal. per Day/year

Annual Total Energy Cost = 37,614 $/year

Total site kBTU's/Yr ÷ Gal. per Day = 6.77

Total KWH/yr x 0.003413 = 1,691.48 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 1,691 MMBTU/year

Electric Utility: Reliant

Gas Utility: N/A

ACCOUNT# 10032789440320110 / 2797831 Electric
10032789440320111 / 2797830 Gas

Water District: Laguna Madre

BUILDING: Water Plant 2

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	95,058		242		7,488		
February	2007	89,682		245		7,016		
March	2007	111,954		259		8,904		
April	2007	95,442		290		7,591		
May	2007	87,762		242		6,980		
June	2007	126,546		256		10,233		
July	2007	93,906		273		8,291		
August	2007	134,610		242		11,884		
September	2007	110,034		222		9,694		
October	2007	101,586		238		8,950		
November	2007	105,042		227		9,255		
December	2007	107,346		221		9,458		
TOTAL		1,258,968		2957		105,745		

Annual Total Energy Cost = 105,745 $/year

Total KWH/yr x 0.003413 = 4,296.86 MMBTU/year
Total MCF/yr x 1.03 = 0.00 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 4,297 MMBTU/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

10032789406351538 / 5900582
10032789409262702 / 2797401

ACCOUNT# 10032789409262702 / 2797401 Electric

BUILDING: Water Plant 1

Water District: Laguna Madre

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2008	17,859		42		1,893		
February	2008	30,147		171		2,804		
March	2008	64,323		164		5,342		
April	2008	53,955		133		4,753		
May	2008	59,715		135		5,203		
June	2008	75,843		177		6,502		
July	2008	49,923		178		4,498		
August*	2008	50,252		143		4,441		
September*	2008	50,252		143		4,440		
October*	2008	50,252		143		4,440		
November*	2008	50,252		143		4,440		
December*	2008	50,252		143		4,440		
TOTAL		603,026		1714		53,196		

* Estimated utility data based on an average of January - July 2008 figures.

Annual Total Energy Cost = 53,196 $/year

Total KWH/yr x 0.003413 = 2,058.13 MMBTU/year
Total MCF/yr x 1.03 = 0.00 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 2,058 MMBTU/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

10032789410165835 / 3430178 10032789412969371 / 2797425
10032789416885326 / 4647581 10032789432383679 / 6413954
10032789442843132 / 2797368 10032789448548271 / 2797361
10032789452191790 / 2797427 10032789452192152 / 2797386
10032789453756860 / 2797415 10032789457636010 / 2797362
10032789457930682 / 2797407 10032789464555000 / 2797375
10032789466763042 / 2797395 10032789469986628 / 3430180
10032789483099880 / 2797371 10032789484912580 / 2797374
10032789485619141 / 2797414 10032789486287260 / 2797370
10032789487272290 / 2797408 10032789490234401 / 2797383
10032789491886910 / 2797382 10032789491886911 / 2797381
ACCOUNT# 10032789494394917 / 4647582 10032789496964921 / 2797364 Electric

Water District: Laguna Madre

BUILDING: Lift Stations (26 Accts)

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	31,266		28		2,792		
February	2007	29,837		63		2,661		
March	2007	36,296		64		3,161		
April	2007	39,099		59		3,396		
May	2007	36,008		35		3,172		
June	2007	43,025		38		3,892		
July	2007	56,270		69		5,226		
August*	2007	59,813		69		5,480		
September*	2007	51,637		48		4,792		
October*	2007	44,635		60		4,178		
November*	2007	41,602		37		3,943		
December*	2007	43,522		26		4,102		
TOTAL		513,010		596		46,796		

* Estimated utility data for Lift Stations 1, 3, 16, 38 based on an average of January - July 2008 figures.

Annual Total Energy Cost = 46,796 $/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Total KWH/yr x 0.003413 = 1,750.90 MMBTU/year
Total MCF/yr x 1.03 = 0.00 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 1,751 MMBTU/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789490420157 / 3496072 Electric

Gas

BUILDING: Cuates Pump Station

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	36,480		112		2,874		
February	2007	25,280		112		1,978		
March	2007	33,120		112		2,634		
April	2007	40,640		106		3,232		
May	2007	41,280		104		3,283		
June	2007	42,720		106		3,398		
July	2007	62,560		107		5,523		
August	2007	43,520		203		3,842		
September	2007	48,480		97		4,270		
October	2007	34,720		96		3,059		
November	2007	30,400		62		2,678		
December	2007	33,920		86		2,988		
TOTAL		473,120				39,759		

Annual Total Energy Cost = 39,759 $/year

Total KWH/yr x 0.003413 = 1,614.76 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 1,615 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789480137913 / 2797421 Electric

Gas

BUILDING: River Pump Station

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	16,704		117		1,316		
February	2007	23,616		115		1,847		
March	2007	30,912		108		2,459		
April	2007	20,544		129		1,634		
May	2007	27,648		106		2,199		
June	2007	27,072		106		2,224		
July	2007	26,112		104		2,305		
August	2007	20,352		111		1,797		
September	2007	28,992		111		2,553		
October	2007	22,464		106		1,979		
November	2007	22,656		106		1,996		
December	2007	25,536		108		2,250		
TOTAL		292,608		1327		24,559		

Annual Total Energy Cost = 24,559 $/year

Total KWH/yr x 0.003413 = 998.67 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 999 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789448301911 / 2797833 Electric

Gas

BUILDING: Reservoir III

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	40		0		3		
February	2007	80		1		6		
March	2007	10,560		97		840		
April	2007	22,320		115		1,775		
May	2007	12,560		112		999		
June	2007	21,120		114		1,756		
July	2007	24,120		93		2,129		
August	2007	18,920		92		1,670		
September	2007	9,240		93		813		
October	2007	40		0		4		
November	2007	680		91		60		
December	2007	80		0		7		
TOTAL		119,760		808		10,063		

Annual Total Energy Cost = 10,063 $/year

Total KWH/yr x 0.003413 = 408.74 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 409 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

Water District: Laguna Madre

ACCOUNT# 10032789436022740 / 2797358 Electric

Gas

BUILDING: Reservoir IV

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	1,920		13		151		
February	2007	2,880		11		225		
March	2007	1,344		11		107		
April	2007	576		6		46		
May	2007	768		11		61		
June	2007	384		1		42		
July	2007	4,032		23		372		
August	2007	5,568		19		492		
September	2007	8,832		19		778		
October	2007	6,528		16		574		
November	2007	4,992		12		440		
December	2007	7,680		13		677		
TOTAL		45,504		155		3,965		

Annual Total Energy Cost = 3,965 $/year

Total KWH/yr x 0.003413 = 155.31 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 155 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

10032789436506090 / 2797379
10032789471854831 / 2797420
10032789480322252 / 2797423

Water District: Laguna Madre

ACCOUNT# 10032789495690480 / 2797406 Electric

Gas

BUILDING: Elevated Tanks 1, 2, 3, & 5

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
January	2007	248		1		20		
February	2007	312		3		24		
March	2007	286		2		23		
April	2007	195		4		16		
May	2007	224		1		18		
June	2007	355		2		29		
July	2007	377		3		34		
August	2007	327		6		29		
September	2007	304		5		24		
October	2007	213		1		19		
November	2007	171		1		15		
December	2007	190		0		17		
TOTAL		3,202		29		268		

Annual Total Energy Cost = 268 $/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = N/A kBTU/SF/year

Total KWH/yr x 0.003413 = 10.93 MMBTU/year
Total MCF/yr x 1.03 = 0.00 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 11 MMBTU/year

Energy Cost Index:

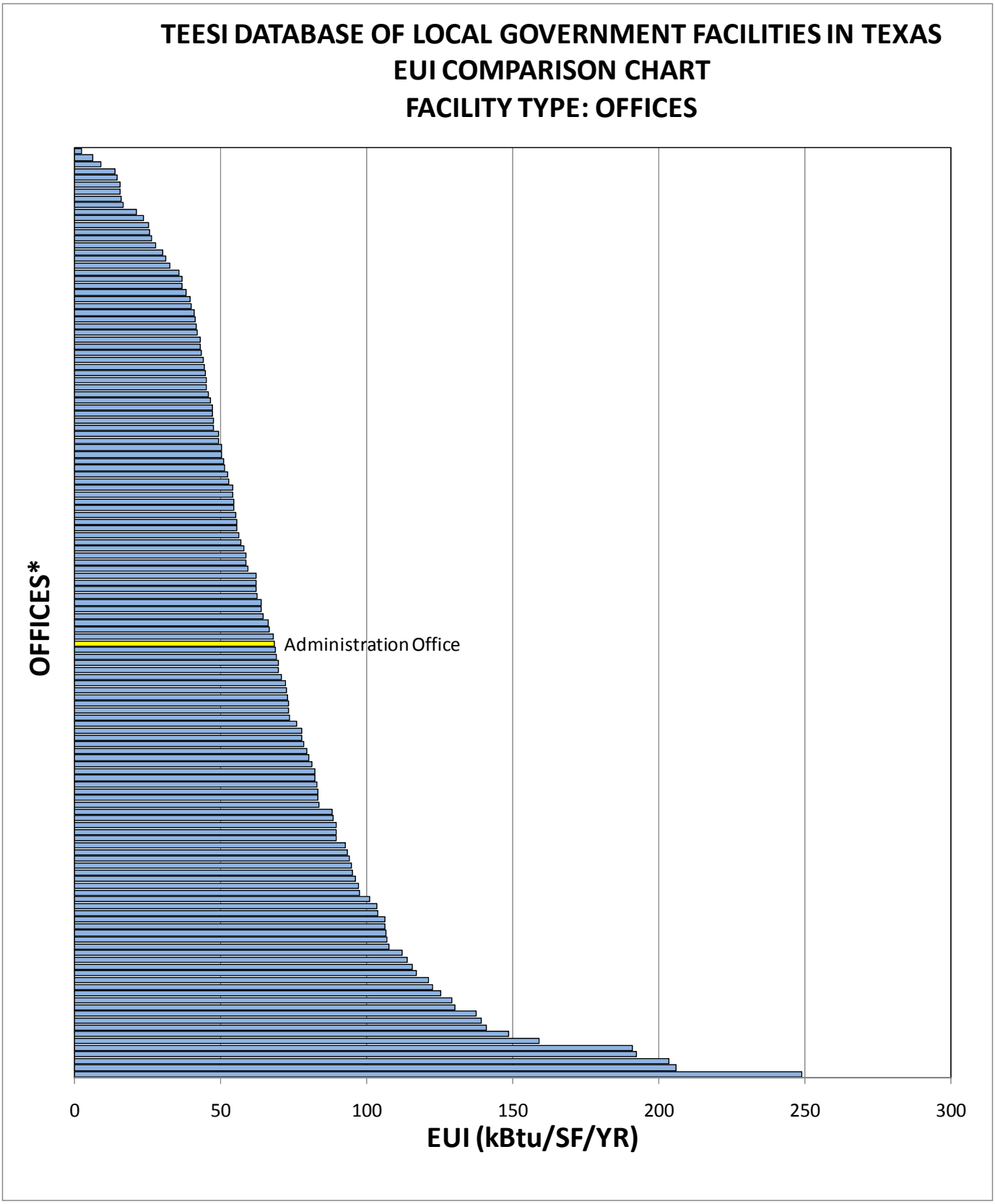
Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Reliant

Gas Utility: N/A

APPENDIX D

ENERGY PERFORMANCE COMPARISON



*Offices (INCL: City Hall, Courthouse, Administrative Offices, Public Works Buildings)

APPENDIX E

ENERGY STAR INFORMATION

The ENERGY STAR® Challenge:
Build a Better World 10% at a Time

Many of us are taking steps to improve the energy efficiency of our homes with ENERGY STAR qualified lighting, appliances, electronics, and heating and cooling systems. But what we may not realize is that the buildings in which we work, shop, play, and educate our children use about $200 billion worth of electricity and natural gas each year.

The U.S. Environmental Protection Agency (EPA) estimates that if the energy efficiency of commercial and industrial buildings in the U.S. improved 10 percent, Americans would save about $20 billion and reduce greenhouse gases equal to the emissions from about 30 million vehicles. You can join us and help reach this goal!

When lights are left on and the heating and cooling system runs in an unoccupied commercial building, energy is wasted. When this happens, a power plant down the road burns fossil fuels to generate that energy and sends emissions into our environment.

In fact, the energy used by commercial and industrial buildings in the United States is responsible for nearly 50 percent of our national emissions of greenhouse gases that contribute to global climate change.

Thanks to the thousands of businesses and organizations that work with EPA's ENERGY STAR Program, we're already saving billions of dollars a year with strategic energy efficiency practices that reduce operating costs and greenhouse gas emissions without tradeoffs in performance or quality. But we're on a journey of continuous improvement — we can do more.

Take the ENERGY STAR Challenge!

Whether you're associated with a small school or a large corporation, a local government or a national association, a community hospital or a hotel group, a manufacturing plant or a retailer — you can be part of the ENERGY STAR Challenge and help improve the energy efficiency of America's commercial and industrial buildings by 10 percent or more.

Challenge participants and their members are encouraged to:

- Measure and track energy use.
- Develop a plan for energy improvements.
- Make energy efficiency upgrades.
- Help spread the energy efficiency word to others.

Now is the time to help build a better world and take many of the same steps at work that you are taking at home to protect our environment. The ENERGY STAR Challenge Toolkit can show you how.

Use the ENERGY STAR Challenge Toolkit to:

- Help you get started on the path toward energy efficiency at work and at home.
- Learn more about energy efficiency for specific building types and how to bring the ENERGY STAR Challenge to your community.
- Access ENERGY STAR brochures, public service announcements, press releases, posters, event ideas, and templates to help spread the word about energy efficiency.

ENERGY STAR® is a government-backed program helping businesses and individuals protect the environment through superior energy efficiency.

LEARN MORE AT energystar.gov

Toolkit Materials:

Get Started!

- **Quick Lists of ENERGY STAR Resources** explain how to help improve energy efficiency in commercial and industrial buildings as well as at home.
- **Create a Challenge Team** offers ideas on who can help create an organized effort in your building, town, school, or company to improve energy efficiency.
- **Bring the Challenge to Your Community** provides a model for establishing a program or campaign to accelerate energy efficiency activities in your community.

Learn More!

- **Did You Know?** provides a summary of key energy efficiency points and information about the ENERGY STAR Challenge.
- **Fast Facts** provide useful statistics to help understand the important role commercial and industrial buildings play in global climate change.
- **Work with Different Groups in the Community** offers a series of fact sheets that provide information on energy use, energy efficiency opportunities, partnership possibilities, and key leverage points for major groups including: new and existing homes, commercial real estate, healthcare, education, hospitality, supermarkets, industry, small business, congregations, and local governments.
- **Grow with ENERGY STAR** describes the different levels and benefits of participation with ENERGY STAR, beginning with taking the ENERGY STAR Challenge and moving beyond to Partner, earning the ENERGY STAR label, Leader, and then the pinnacle — Partner of the Year.

Spread the Word!

- **ENERGY STAR InfoCards** help consumers and businesses learn about energy efficiency and ENERGY STAR.
- **Sample News Releases** for the media.
- **Sample Text** provides copy for Web sites, e-mails, newsletters, and more to help you communicate with clients, constituents, employees, and business-to-business networks.
- **Energy Efficiency Presentation** you can use to talk about energy efficiency and your involvement in the ENERGY STAR Challenge.
- **Celebrate with ENERGY STAR** suggests events and ideas to promote the ENERGY STAR Challenge and celebrate energy efficiency.
- **Certificate of Participation** announces your involvement in the ENERGY STAR Challenge and can be displayed to share the good news of your efforts with others.
- **Web Banners** can be easily downloaded to use on Web sites.
- **Posters and other materials** communicate energy efficiency messages and provide information on how to get involved.

Contact Information

To take the ENERGY STAR Challenge or to access the ENERGY STAR Challenge Toolkit materials online, visit **www.energystar.gov/challenge**.

ENERGY STAR Program
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Mail Code 6202J
Washington, DC 20460

For more information
www.energystar.gov
or call **1.888.STAR.YES**
(1.888.782.7937).

United States
Environmental
Protection Agency
EPA

Office of Air and Radiation
(6202J) EPA 430-F-07-016
August 2007

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APPENDIX F

LOANSTAR INFORMATION

Texas LoanSTAR Program

FACTS ABOUT LoanSTAR

The State of Texas LoanSTAR (Saving Taxes and Resources) Program finances energy efficient facility up-grades for state agencies, public schools, institutions of higher education, local governments, municipalities, and hospitals. The program's revolving loan mechanism allows participants to borrow money and repay all project costs through the stream of **cost savings** produced.

ELIGIBLE PROJECTS

Up-grades financed through the program include, but are not limited to, (1) energy efficient lighting systems; (2) high efficiency heating, ventilation and air conditioning systems; (3) energy management systems; (4) boiler efficiency improvements; (5) energy recovery systems; (6) building shell improvements; and (7) load management projects. The prospective borrower hires a Professional Engineer to analyze the potential energy efficient projects that will be submitted for funding through the Loan STAR Program. All engineering costs are covered under the program.

PROGRAM REQUIREMENTS

Once the projects are analyzed and the prospective borrower agrees with the recommended projects, the engineer prepares an Energy Assessment Report (EAR) with the project descriptions and calculations. The EAR must be prepared according to the LoanSTAR Technical Guidelines. The EAR is reviewed and approved by the State Energy Conservation Office (SECO) technical staff before project financing is authorized. Projects financed by LoanSTAR must have an average simple payback of ten years or less. Borrowers do, however, have the option of buying down paybacks to meet the composite ten-year limit.

To ensure up-grade projects are designed and constructed according to the EAR, SECO performs a review of the design documents at the 50% and 100% completion phases. On-site construction monitoring is also performed at the 50% and 100% completion phases.

SAVINGS VERIFICATION

To ensure that the Borrower is achieving the estimated energy savings, monitoring and verification is required for all LoanSTAR funded projects. The level of monitoring and verifications may range from utility bill analysis to individual system or whole building metering depending on the size and type of retrofit projects. If whole building metering is required, metering and monitoring cost can be rolled into the loan.

For additional information regarding the LoanSTAR program, please contact:

Theresa Sifuentes
SECO, LoanSTAR Program Manager
(512) 463-1896

APPENDIX G

DESCRIPTION OF SECO PROGRAMS

Texas State Energy Conservation Office (SECO)

The Texas State Energy Conservation Office (SECO) helps Texas make the most of domestic energy, reduce state and local government energy costs and promote cost-effective, clean-energy technologies. SECO's mission is to maximize energy efficiency while protecting the environment.

LoanSTAR Revolving Loan Program: has saved taxpayers more than $224.6 million through energy-efficiency projects for state agencies, institutions of higher education, school districts, county hospitals and local governments. Borrowers repay loans through cost savings generated by the projects. LoanSTAR-funded projects have also prevented the release of 7,781 tons of nitrogen oxides (NOx), 2.3 million tons of carbon dioxide (CO2) and 5,339 tons of sulfur dioxide (SO2).

Schools/Local Government Energy Program: has helped more than 3,500 schools and other units of local government set up and maintain effective energy-efficiency programs. SECO provides facility preliminary energy assessments, energy management training workshops, technical support in designing new facilities and on-site training for student energy awareness projects. Clean energy technologies are demonstrated at public facilities and school districts to increase awareness and address air quality at the community level. Texas schools also employ the computer power management software that puts monitors to "sleep" when not in use. Over 136,000 school computers now use this software, saving 42 million kWh and reducing energy costs by $3 million annually.

Energy Education Program: promotes energy conservation and efficiency through education. The program strives to lay the foundation for environmental stewardship in teachers and students through critical-thinking and problem-solving investigations in Texas Education Agency approved workshops. Over 2,500 teachers have attended these workshops and utilized the materials in their classrooms reaching over 375,000 students. The program also supports fuel cell technical training curriculum development at the college level.

State Agencies/Higher Education Program: ensures that new facilities are designed and built with energy efficiency and water conservation in mind. Projects include administration and maintenance of the Energy and Water Conservation Design Standard for new state buildings and major renovation projects. Other initiatives include development of statewide employee energy awareness through workshops on how energy efficiency and employee behavior can reduce energy use. The program provides educational materials on how to use energy more efficiently through product procurement, innovative technologies and sustainable design practices. This program also provides education and outreach on residential and commercial energy codes statewide. The goal is to demonstrate the clear benefits of energy codes and standards in improving the quality of life, the environment and the safety and health of communities.

Alternative Fuels Program: demonstrates the positive environmental impact, technical feasibility and energy efficiency of domestically-produced alternative fuels. The Alternative Fuels Program is designed to assist state agencies, school districts, local government and private fleets to operate more of their fleets on alternative fuels. Initiatives include support for the Clean Cities Program, Clean School Bus USA Program, Mechanics Education Outreach and Air Quality Demonstration Projects.

Energy Management Services: a comprehensive energy management program designed to significantly reduce energy and utility expenditures in state-owned facilities. The State of Texas spent over $216 million in energy and utility expenditures in 2006. Program components include construction of a state-of-the-art energy and utility information management system, a comprehensive analysis of historic and future utility bills, energy procurement at the lowest possible rates and best available terms, and owner's representative services on ongoing and future energy-conservation projects. Institutions of higher education, state university systems and local governments are eligible to participate in the program.

Innovative Energy Program: promotes the use of renewable energy and sustainable building practices through technology demonstration, hands-on instruction and renewable energy education. Renewable energy has significant economic, security and reliability benefits and opportunities for Texas communities and individuals as they develop and use these resources. SECO increases public awareness of Texas' vast renewable energy resources and provides the public better access to vendors, financing options, and renewable energy incentives through its educational web site, The Infinite Power of Texas, at www.infinitepower.org.

Housing Partnership Program: promotes the efficient use of energy in low-to-moderate-income housing through partnerships among nonprofit organizations, community action agencies, local governments, utility companies, public housing authorities and social service organizations. The program encourages community and residential involvement in energy-efficiency projects such as housing retrofits, model demonstration projects, technical training assistance and energy education workshops and seminars.

Pollution Mitigation Program: assists political subdivisions in the 41 non-attainment counties to reduce electric consumption in their facilities by implementing cost-effective energy efficiency projects. SECO provides technical support and guidance through the Texas Energy Partnership, a joint initiative involving SECO, the U. S. Department of Energy and ENERGY STAR®. Information, planning tools and electronic reporting are offered at www.texasenergypartnership.org.

Pantex Program: The Pantex Nuclear Weapons plant, located in Carson County, is responsible for assembling and disassembling nuclear weapons. The U.S. Department of Energy funds the Texas Agreement in Principle, which SECO has administered since 1990. SECO contracts with a variety of state and local governments to ensure that human health and safety, and the environment, are protected around the plant. The Pantex Program also administers a DOE grant to train local emergency responders along routes that have shipments of radioactive waste going to the Waste Isolation Pilot Plant near Carlsbad, New Mexico, and eventually shipments of spent fuel tentatively scheduled to go to Yucca Mountain in Nevada.

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APPENDIX H

SAMPLE ENERGY MANAGEMENT POLICY

The following document is Energy Management Policy Template. This document should be customized based on the specific needs and requirements of LMWD.

SAMPLE ENERGY MANAGEMENT POLICY

INTRODUCTION

An essential element of a successful energy management program is support and commitment from top management. A resolution passed by the governing body alerts employees and the community to the fact that energy conservation is official policy, and paves the way for future programs.

To reduce and control operating costs through energy management, an organization should establish a plan, which defines specific goals and an organizational framework to accomplish them; hence, LMWD Energy Management Policy.

LMWD Energy Management Policy is intended to be a dynamic, working document. It will be referred to as the PLAN throughout this document. It should be amended as time, conditions, and experience dictates. To facilitate amendments, each page is to be numbered and dated.

Following is an outline of the main sections of this document:

- **INTRODUCTION**
- **ENERGY MANAGEMENT POLICY**
- **PURPOSE AND GOALS**
- **ORGANIZATION STRUCTURE/MANPOWER**
- **ACTION PLAN**
- **INITIAL SCOPE**

ENERGY MANAGEMENT POLICY

LMWD is committed to operating in the most cost effective, efficient manner while maintaining municipal services at the highest quality possible. A commitment to efficient operation will benefit the community and taxpayers without compromising the safety or efficiency of municipal staff. We recognize the importance of an energy management function and do hereby delegate the authority and responsibility to develop, operate, and maintain a cost effective Energy Management Program to an Energy Manager and/or Energy Management Staff.

Rapidly rising costs of utilities is a great concern. Unless these costs can be brought under control, funds earmarked for municipal services and programs will need to be diverted to fund increasing operating costs. Many Texas cities have made considerable progress toward controlling these spiraling costs by instituting cost effective Energy Management Programs.

It is our goal to reduce LMWD's energy consumption by following adoption of this policy. The fulfillment of this plan shall be the joint responsibility of LMWD's governing board, employees, building officials, and its citizens.

LMWD will maintain accurate records of energy consumption and costs on a monthly basis. Energy audits will be conducted annually at each facility and recommendations will be made for updating the Energy Management Program. Guidelines and procedures will be reviewed and approved by LMWD Manager. Information will be furnished to the media on goals and progress of the Energy Management Program.

A method of monitoring and tracking energy costs and consumption shall be implemented. Quarterly energy progress reports will be submitted to LMWD Manager and distributed accordingly.

All planned construction and retrofit work shall be designed with energy as a primary consideration. The energy performance of all new construction and planned retrofits shall be evaluated during the architectural and engineering design phase to ensure energy efficient design and operation.

Approved this _____ day of _____, 2008

_____

Water District Manager

PURPOSE AND GOALS

Purpose

LMWD is faced with tight budget constrains and increased demands for municipal services. The purpose of this plan is to reduce LMWD's energy cost while maintaining a comfortable and safe working environment for District staff.

Goals

The goals of the Energy Management Plan (hereafter referred to as the PLAN) are to:

- Centralize and coordinate energy management activities;
- Continue to integrate energy management into facilities planning, new construction, operations, maintenance and renovation activities;
- Implement activities in the categories identified in the PLAN;
- Reduce electrical, natural gas, and water consumption District-wide;
- Evaluate the condition of facility equipment and analyze the effectiveness of upgrading such equipment in order to achieve the highest efficiency possible;
- Implement and enforce energy conservation policies and procedures.

ORGANIZATION STRUCTURE/MANPOWER

Organizational Structure

A successful Energy Management Program requires the commitment and involvement of all District employees. The specific responsibilities of key individuals/ groups are outlined below:

- *District Manager*

  LMWD Manager is responsible for approving the PLAN, designating an energy manager and/or engineer, reviewing recommendations of the Energy Management Steering Committee, adopting policy directives regarding construction, maintenance and operation of buildings and other service delivery systems, allocating funding, and providing support staff as needed. LMWD Manager is also responsible for final review and approvals of all proposed policy directives, funding requests, and requests for line and support staff associated with PLAN.

- *Executive Directors of Facilities and Maintenance & Operations*

  The ***Title of Person in Charge of the Energy Program*** is responsible for promotion and implementation of LMWD's Energy Management Program objectives in the operation and maintenance of existing facilities, and in all construction of new facilities. He/She will assist in the identification and allocation of resources needed for the successful implementation of the PLAN.

- *Building Managers/Designated Building Officials*

  Each building official will be responsible for the energy consumption within their facility and will designate (or function as) the building energy coordinator. The energy coordinator will be expected to:

  Develop and implement an energy conservation plan for each respective building or facility. The plan should elicit full staff involvement.

  Organize and direct a building action group willing to support implementation of the Energy Management Program plan and search for additional energy cost reduction measures.

- *District Energy Manager*

  The Energy Manager is responsible for day-to-day administration, implementation, and monitoring of the PLAN. He/she will initiate actions and allocation of resources as necessary to achieve the goal as presented in the PLAN. Initiation of activities in the nine main categories under Initial Scope will be the Energy Manager's responsibility, along with annually reviewing and updating the PLAN. He/she will report activities and results **quarterly**, to all members of the energy steering committee. The Energy Manager will receive formal training in the operation of all types of Energy Management Systems installed throughout LMWD. While coordinating activities with the Facilities Department, the Energy Manager will report directly to the ***Title of Person.*** The Energy Manager will also serve as a liaison between the Construction and O&M departments, as applicable.

- *Employees and Staff*

  All employees and staff are responsible to assist in the PLAN by providing input to the Energy Management Steering Committee and helping with implementation of operational measures in their areas. There are many free programs offered by the state and federal governments.

- *Energy Management Steering Committee*

  The Energy Management Steering Committee will include representatives from a cross section of LMWD. The steering committee will serve as a review board to evaluate all energy management recommendations before adoption and implementation. The steering committee will meet **quarterly or semiannually** to review LMWD's energy cost and consumption. Regular meetings will ensure LMWD's goals are being met prior to the end of the year.

ACTION PLAN

An effective energy management effort must be organized and integrated. The following are essential elements of LMWD Energy Management Plan:

- Data Gathering;
- System Analysis / Definition of Corrective Measures;
- Energy Cost Reduction Measure (ECRM) Evaluation;
- Identification of Funding Mechanisms;
- Implementation;
- Publicity / Communication and Incentive Systems;
- Training; and
- Monitoring Program Effectiveness

Each element is discussed briefly below:

Data Gathering

- To hit the target in LMWD energy management efforts, it is imperative to know where to aim. The purpose of this step is to inventory energy using systems and gather, organize, and analyze information on energy use, cost, and availability in order to focus on corrective projects with the most potential.

  Major energy using systems to be inventoried include:

  Buildings, and
  Athletic field and other outdoor lighting

  Energy consumption and cost will be tabulated monthly using billed / metered data for each major component of each system for a base year prior to PLAN initiation. Since this is a massive task with massive amounts of data to gather, it needs to be phased in concurrently with other PLAN activities starting with the building database.

Data will be organized as follows:

Buildings:

1) Square footage
2) Monthly consumption (kWh, KW, MCF, Gallons, etc.) and costs.

Municipal Utilities & Lighting (i.e., Water treatment, Wastewater treatment, Street Lighting, Sports Lighting, etc., as applicable;

1) Pump ratings & quantities, by location,
2) Lamp types & quantities, by location
3) Operating hours and costs by location.

The Energy Manager will gather this data with input from department heads, accounting personnel, and gas and electrical utilities.

The purpose of the data-gathering phase is to provide a baseline for later comparison, to monitor program effectiveness; identify major energy and water users; and identify any billing problems. The existing computer-based energy accounting system should prove invaluable in this effort.

Applicable utility rate schedules should be collected and reviewed as part of this step. Rate analyses should be conducted to ensure that District facilities are on the applicable rate schedules resulting in the lowest total facility energy costs. Assistance from the ***Energy Provider*** and consultants can be utilized in conducting billing rate analyses.

System Analysis/Definition of Corrective Measures

- Concurrent with inventorying and studying the energy use characteristics of major energy using systems, conduct preliminary filed surveys of large energy users within each system. The purpose of the preliminary field surveys is to identify M&Os and capital intensive Energy Cost Reduction Measures (ECRMs) that could be implemented to reduce energy consumption and to collect initial data required for further analysis. The product of the preliminary field surveys will be a report describing physical and operational characteristics of the systems surveyed, along with lists of recommended M&Os and ECRMs for each component. The preliminary field surveys will be conducted under the direction of LMWD's Energy Manager with outside assistance as necessary.

ECRM Evaluation

- This step will be conducted by District personnel with outside assistance as needed. It will include a detailed analysis of materials required, labor and material costs, and potential energy cost saving for ECRM. Interactions between ECRMs will be analyzed and simple paybacks calculated.

- The Energy Manager will present the findings of the engineering studies to the ***Title of Person*** for review. Projects with payback periods of six years or less will receive special consideration for implementation.

Identification of Funding Mechanisms

- An energy management line item should be included in LMWD budget to take care of low cost, maintenance, and operational items that require immediate attention. Any utility rebates and a percentage of the recouped over-billings should go into this budget.

- All potential funding mechanisms should be identified and evaluated including:

  - Low interest state loans (LoanSTAR);
  - Federal and state grants and loans;
  - Low interest loans from private lenders;
  - Performance Contracting;
  - Shared savings programs;
  - Internal funding mechanisms; and
  - Bond issue funds.

Implementation

- Implementation involves selecting a funding mechanism, submitting paperwork to secure ECRM funding, monitoring the ECRMs through funding, design, and construction, monitoring the progress of M&O implementation.

Publicity / Communication and Incentive System

- Good communication is one of the key elements in overall program effectiveness. The Energy Manager must strive to keep the lines of communication open from building operators up to LMWD Manager and back down again. Contractors involved in ECRM implementation must also have a conduit into the communication channel.

- A good energy accounting system / mechanism should be used to monitor cost savings and to compare base year consumption with current year consumption. An energy incentive plan should be developed consisting of personnel awards, organizational awards, preferred parking, and/or other forms of recognition as appropriate.

- The successes of the program should also be communicated to the public through suitable media to show what LMWD is doing to reduce costs to taxpayers.

Training

- Energy management methods and technology are constantly improving. Training will be conducted periodically to keep abreast of the latest developments in the field. The following sessions are conducted as deemed necessary:

  - In house training to be conducted for relevant maintenance and custodial staff;
  - On site training for controls systems;
  - Off site training as set by need in a particular technology; and training of District personnel shall be provided by qualified District staff with an outside assistance as necessary. Energy awareness programs will be implemented by District staff to improve efficiency of usage.

Monitoring Program Effectiveness

- The program monitoring process should be used to keep the Energy Management program on track by:

  - Making improvements where data suggest deficiencies;
  - Revising goals where revisions seem warranted;
  - Pursuing new alternative as indicated

- The monitoring process involves distinct types of efforts:

  - Monitoring individual activities in terms of quality of implementation
  - Monitoring overall program effectiveness in terms of savings.

- The following tools will be used for monitoring:

  - Energy tracking savings data;
  - Individual project metering when appropriate
  - Interviews with key personnel.

INITIAL SCOPE

The Energy Manager shall concentrate on the following items during the initial implementation phase of this Energy Management Policy. Following is a checklist and a description of work for each item.

- Maintenance and Operation Measures (M&Os) for Building and Equipment;
- Computer Energy Accounting System;
- Energy Cost Reduction Measures (ECRMs);
- New Building Design and Construction;
- Purchasing;
- Recreation Area, Parking Lots, and Security Lighting;
- Alternative Energy Sources;
- Energy Management Systems (EMS); and
- Water Management

Maintenance and Operation Measures (M&Os) for Buildings and Equipment

- Inventory all major Heating, Ventilation, and Air Conditioning equipment by facility and record location, capacity/size, manufacturer, model number, and electrical data. Assign an I.D. number to each piece of equipment and note location on fire evacuation route floor plan.

- Establish a system for preventive maintenance of equipment within the Building Maintenance Department.

- Inventory building equipment (lighting, HVAC, etc.) operating hours, and implement a program to turn off equipment during unoccupied periods and to reduce light levels as appropriate.

- Inventory high energy usage equipment (electric boilers, ovens, etc.) by facility record location, capacity / size, manufacturer, model number, electrical data.

- Survey Building Envelope by facility and record existing condition for all items that can leak air into or out of any building. The surveyor should use 8 1/2 x 11 fire evacuation floor plan to note problem areas such as loose fitting windows, cracks around doors and envelope penetrations by pipe and conduits. The maintenance department shall follow the surveyor and make corrections.

- Provide for training of M&O staff both in-house and through outside seminars to maintain skills and develop new skills as required.

- Establish a District-wide uniform temperature set point for all HVAC units. For example **74°F Cool / 68°F Heat**, during occupied hours and **80°F Cool / 55°F Heat**, during unoccupied hours. Having a standard setpoint will help staff members keep HVAC runtimes to a minimum.

Computer Energy Accounting System

- Energy Cost Reduction Measures (Collect-required base year input data for all energy using systems.

- Monitor monthly and annual energy consumption and cost by energy using system component and fuel type.

- Utilize energy tracking data to monitor energy program effectiveness and to establish an incentive program.

Energy Cost Reduction Measures (ECRMs)

- Identify potential ECRMs for each major District facility (in-house, engineering firm and utility company).

- Analyze ECRM cost effectiveness.

- Pursue funding as appropriate.

New Building Design and Construction

- Conduct training for architects, engineers, contractors, and building inspectors.

- Ensure compliance by holding pre-design meetings with Architectural / Engineering Firms and pre-construction meetings with Contracting Firms.

- Monitor compliance by reviewing plans and specifications; reviewing shop drawings and catalog cuts; inspection construction in progress.

- Review HVAC test and balance data, and conduct final inspection with punch list.

- Utilize the services of an energy engineering design firm to provide energy related design assistance to the lead A / E firm on new construction projects.

- Ensure proper maintenance and operation of energy using equipment in new buildings by required adequate documentation of all systems and control strategies, specifying minimum content of M&O manuals; specifying contractor requirements for cleaning and adjusting equipment prior to occupancy; specifying on-site vendor training for M&O staff; and requiring as-built drawings.

Purchasing

- Evaluate the long-term energy costs, in addition to initial cost, in purchasing energy using equipment. Apply life cycle costing techniques whenever possible.

- Establish energy efficiency standards for the purchase of common items; i.e. fluorescent lamps, ballast, electrical motors, direct expansion (DX) air-conditioners, water heaters, and small gas furnaces.

- Take advantage of the State Purchasing contract to get the best prices on energy efficient equipment.

Recreation Areas, Parking Lots, and Security Lighting

- Convert existing incandescent and mercury vapor lighting to metal halide or high-pressure sodium as appropriate. Specify these high efficiency light sources on new projects.

Alternative Energy Sources

- Pursue cost effective applications of alternative energy sources including active and passive solar design, daylight, and alternative fuels.

Energy Management Systems (EMS)

- Optimize operation of any existing energy management systems.

- Conduct continuous monitoring of building HVAC system operations, using EMS.

- Utilize EMS diagnostic features for equipment maintenance.

- Evaluate & implement EMS controls at all facilities, as appropriate.

Water Management

- Investigate the use of water conserving faucets, showerheads, and toilets in all new and existing facilities.
- Utilize water-previous materials such as gravel, crushed stone, open paving blocks or previous paving blocks for walkways and patios to minimize runoff and increase infiltration.
- Employ Xeriscaping, quality landscaping that conserves water and reduces the need for supplemental irrigation.
- Utilize drip irrigation systems for watering plants in beds and gardens.
- Install controls to prevent irrigation when the soil is wet from rainfall.
- Implement leak detection and repair programs.
- Provide separate metering for the irrigation and HVAC systems usage monitoring, if applicable.

END

APPENDIX I

SECO WATER EFFICIENCY GUIDELINES

STATE ENERGY CONSERVATION OFFICE SUGGESTED WATER EFFICIENCY GUIDELINES FOR BUILDINGS AND EQUIPMENT AT TEXAS STATE FACILITIES

The 77th Legislature directed the State Energy Conservation Office to develop a set of water efficiency standards for state agencies. This document represents SECO's response to that request.

We wish to thank the Texas Water Development Board and the City of Austin Water Conservation Office for their assistance in preparing these guidelines.

The following is a guideline that should be followed for new buildings and facilities and purchase of any new or used equipment by the State. These guidelines would also apply when purchasing new or used equipment to replace existing equipment, or for making major modifications to existing systems or equipment that equals more that half the original purchase price of the equipment. These should also be used as guides for upgrading existing equipment. A system approach should be used when examining water use in this sector. The goal shall be to balance water, wastewater, energy, and related costs to achieve the lowest lifecycle cost when purchasing new equipment or making modifications to existing equipment.

Irrigation Requirements

Automatic irrigation systems should comply with the following guidelines. These guidelines should be noted on a plan drawn by the agency, licensed irrigator or licensed landscape architect.

1. Adjustable flow controls valves on circuit remote control valves. Pressure regulation component(s) shall be required where static pressure exceeds manufacturer's recommended operating range (30-60 psi). This component(s) may be installed at the valve or at the head.

2. Valves and circuits shall be separated based on water use, (hydro-zoned) so that turf and shrub areas, sun and shade areas, as well as high and low runoff areas may be watered separately.

3. The minimum precipitation rate that can be applied by any zone of conventional irrigation should be in accordance with State regulations established by the Texas Natural Resource Conservation Commission. Sprinkler heads shall have matched precipitation rates within each control valve circuit.

4. Serviceable check valves shall be required where elevation differential may cause low head drainage adjacent to paving areas.

5. Sprinkler head spacing shall be designed for head-to-head coverage or heads shall be spaced as per manufacturer's recommendations and adjusted for prevailing winds. The system shall be designed for minimum run-off. There shall be no direct over spray onto impervious areas (i.e. paving and structures).

6. All automatic irrigation systems shall be equipped with a controller capable of dual or multiple programming. Controllers should have multiple cycle start capacity and flexible calendar program, including the capability of day of week or day interval watering. All automatic irrigation systems shall be equipped with a rain sensor shut-off device.

7. Irrigation construction plans shall include a water budget. A water budget should include:

a) Estimated monthly water use (in gallons per application) and the area (in square feet) irrigated.
b) Precipitation rates for each valve circuit.
c) Monthly irrigation schedule for the plant establishment period (first three months) and recommended yearly watering schedule, including seasonal adjustments.
d) Location of emergency irrigation system shut-off valve.

8. All in-ground irrigation systems shall have backflow prevention device installed that meet local code.

9. In addition to local requirements, all irrigation systems must comply with the Texas Natural Resource Conservation Commission rules and regulations.

10. Where available, reclaimed water will be used for all purposes allowed by rules established by the Texas Natural Resource Conservation Commission, if the reclaimed water is less costly than potable water or other water currently being used by the purposes that reclaimed water can be use.

11. Sources of water such as water from foundation and basement sump pump discharges, air conditioner condensate, captured stormwater or rainwater, and other sources should be explored and used as long as local plumbing codes are followed.

Landscape Design Standards (Based on the Landscaping Guidelines adopted by the General Services Commission pursuant to SB 814, 73rd Legislature)

1. Irrigated turf areas and planting beds should be limited to as small an area as possible.

2. Areas that are irrigated shall have at least six inches of a good quality soil in the areas to be watered.

3. Plants having similar water needs shall be grouped together and shall be selected based on use, soil and sun/shade conditions, adaptability to geographic and climatic conditions, and upon ability to survive, once established, on normal rainfall or minimal irrigation.

4. Irrigated turf shall be used sparingly and only in circumstances where other landscaping media will not satisfy the site's needs.

5. Turf and overhead sprinklers should not be placed along curbs and in parkways and planning islands less than 6 feet wide.

6. All new construction projects shall include specifications for soil analysis and amendments, such as compost, in type and quantity necessary to enhance plant growth and maximize water retention. All landscape planting selections must, be appropriate for the soil as analyzed and amended.

7. In planted areas, mulches of two inches or more shall cover most soil surfaces to minimize soil moisture evaporation.

8. Turf shall be limited to 90% of landscaped areas.

9. Turf grass selection shall be determined by facility need and geographic location. Use of different types of turf for distinctive purposes is encouraged. Turf types that can be maintained on natural rainfall is encouraged.

Plumbing Fixtures and Practices

1. All water closets shall comply with state plumbing standards as administered by the Texas Natural Resource Conservation Commission.

2. Faucet aerators in public lavatories and hand washing facilities shall have a flow rate of no more than 1.0 gallons per minute. All other faucet aerators shall comply with state plumbing standards as administered by the Texas Natural Resource Conservation Commission.

3. Faucets in high use restrooms shall be self-closing or shall be equipped with on-off sensors.

4. Showerheads for lockers, dorms, and other non-medical purposes shall use no more than 2.0 gallons per minute. All other showerheads shall comply with state plumbing standards as administered by the Texas Natural Resource Conservation Commission.

5. All water fountains shall be self-closing.

6. All hot water lines shall be insulated.
7. All water pipes subject to freezing shall be insulated.

8. Special plumbing fixtures other that the ones mentioned above should be chosen based on their water and energy efficiency and functionality.

9. All major new buildings, cooling towers, and irrigation systems shall be separately metered and records kept to determine use.

10. Signage requesting that leaks and other plumbing problems be promptly reported shall be placed in each restroom, shower facilities, kitchen, laundry, pool, and other high water use areas. The signage shall also have the phone number where to report such problems.

Heating, Ventilation, & Air Conditioning Equipment

1. Cooling towers and boiler chemical contracts shall specify the cycles of concentration to be achieved. The cycles of concentration should be set to match local water chemistry but shall exceed at least four cycles unless the blowdown from the tower is being beneficially reused for landscape irrigation or other uses.

2. Steam condensate shall be returned to the boiler unless volumes are too low to justify condensate return loops. In the latter case, the condensate shall be reused beneficially wherever possible.

3. Condensate from the air conditioner cooling coils should be captured and used for cooling tower makeup or other purposes where feasible. Building design should be considered that would help facilitate the easy capture of condensate by convent location of air handling units.

4. Cooling tower side stream filtration shall be investigated when new systems are purchased.

Water Treatment Equipment

1. If water softening is used, regeneration shall be controlled by actual hardness or by a flow volume control that is based on the hardness of the water to be softened. Softeners that use timers for recharging are prohibited.

2. If reverse osmosis or nano-filtration is used, reject waste volumes shall be reused for landscape irrigation or other beneficial purposes.

Refrigeration Equipment

1. Once through cooling of any refrigeration equipment is prohibited. Refrigeration equipment (i.e. refrigerators, walking coolers, ice cream and yogurt machines, and similar equipment) of 10 tons per hour or less shall be air-cooled or be fed with water from a closed cooling water loop.

2. Ice flake machines should be used instead of ice cubes makers whenever possible. Ice flakes require less water to produce. If ice cube makers are used, they shall be air-cooled and use no more than 20 gallons per 100 pounds of ice produced based on the Air-conditioning & Refrigeration Institute's annual Directory of Certified Automatic Commercial Ice-Cube Machines and Ice Storage Bins.

Warewashing

1. New warewashing equipment shall use less than 1.2 gallons of fresh water per rack based on National Sanitation Foundation information.

2. Conveyor-type dishwashers shall have electronic eye sensor system so that the machine only operates when there are dishes present on the conveyor belt, not continuously. If the conveyor is continuously running, expecting another load of dishes, water and chemicals are also spraying, to clean the ware that is not even there. This is a waste of energy, water, and chemicals.

Garbage Disposals

1. Manually scrap dishes into a garbage can or scrap basket to reduce the need for pre-rinse and/or pre-rinse time.

2. Manual pre-wash units shall have shut-off's that turn the water off when the operator lets go of the nozzle.

3. Garbage grinders and disposals should not be use where manually scrapping and the use of a scrapping basket with the pre-wash spray can be efficiently done.

4. All garbage disposals shall be equipped with solenoids that shut water flow to the disposal off when not in use.

5. All garbage disposals shall be air-cooled.

6. A scrapping system, a complete pre-rinsing and disposing system, that can increase efficiency in some kitchens. A recirculated water plume in the salvage basin allows the ware to be simultaneously soaked and rinsed, increasing scrapping efficiency and because the water is recirculated, new water does not need to be added. Waste falls from the salvage basin into a collection basket.

7. Where volume of use makes it feasible, install a recirculating "pot scrubbing" or Jacuzzi-style sink to loosen up foodstuff rather than under a stream of running water.

8. A fresh-water trough system, used for scrapping and pre-rinse, can use up to 14 gallons a minute and is not recommended. The amount of pressure and water needed to keep the waste

moving down the trough to the disposal or scrap basket is not efficient. A recirculating trough system, with water flow controls can cut water use in half. However, recirculating pre-rinse and scrapping basins are more water efficient than trough systems in general. If possible do not even use a trough.

Steamers

1. Steamers shall be of the self-contained, boilerless type that does not have a direct connection to a water supply.
2. Steamers that are connected directly to a water line, at the best, have a continuous blowdown of a quarter of a gallon per minute, but most continuously dump much more. They are significantly less energy efficient and require soft water with no more that 60 parts per million of total dissolved solids or require that very large volumes of water be continuously passed through to the sewer for water quality control.

Clothes Washing Equipment

1. Commercial clothes washing equipment such as those found in central laundry facilities shall use no more that 1.6 gallons per pound washed.

2. Clothes washers shall have double dump valves and equipment of 150 pounds capacity or greater shall be equipped so that the final rinse water can be returned for use in the first flush wash.

3. Smaller residential type clothes washers intended for personal use by clients or inmates shall have a water use factor of 9.5 gallons per cubic foot of washer volume or less. This is a different standard from the one cited for commercial laundries above. Information for this can be obtained Oregon Residential Tax Rebate Program at the following web site http://www.energy.state.or.us.

Pumps

Water pumps shall have mechanical seals unless prohibited by code.

Metering

1. All buildings intended for daily occupation or for water using equipment operation shall be metered separately and records of its water use maintained by that agency.

2. If any one, single activity or piece of equipment at a facility accounts for more that 20% of the total water use at that facility, it shall be metered separately and records of its water use maintained by that agency.

3. Any water use that does not create waste water should be metered separately to better align waste water costs with actual usage.

Vehicle Washing

1. New softeners installed at carwash facilities shall not use timers to determine when to recharge. Recharge cycles shall be controlled by instruments that measure volume of water treated or the actual quality of the water being softened

2. Reverse osmosis or nano-filtration reject water shall be reused beneficially for vehicle washing.

3. Chamois wringer shall have self-closing valves on their faucets

In-bay: Hand held spray wash equipment including spray wands and foaming brushes shall use no more that 3.0 gallons of water per minute and shall be equipped with trigger shutoffs. The shutoffs shall have weep holes or other devices to allow for drainage and pressure surges. All pressure wash equipment shall be equipped with unloader valves.

Conveyor, drive-through, and rollover type car washes: Equipment for automobiles and small truck and vans shall use no more than 15 gallons per vehicle. Washes designed specifically for buses and tractor-trailer rigs shall use no more than 40 gallons per vehicle washed. All such equipment shall be equipped with re-circulation or reuse equipment.

Bench Mark Indices[1]

For Texas, the amount of outdoor water will vary with location ranging from 20 inches per year in Far East Texas to 48 inches a year in Far West Texas. For the San Antonio to Dallas line, the demand is about 36 inches per year or about 22 gallons per square foot of use. Many state facilities do not water the whole campus and when they do, they use under that amount. Most schools do not irrigate in Texas. For your use, the conversion from inches to gallons per square foot is 0.623 gallons of water per inch per square foot. In other words, if a campus irrigates 10,000 square feet at a rate of 40 inches a year, they will use {10,000 X 40 X 0.623 = } 249,200 gallons a year.

As for the numbers above, they represent the low end from an American Water Works Association study completed in 2000. The range of use we see in public facilities can be significantly higher. For example, in a study of over 300 schools in Texas, the water use ranged from two gallons per student per day to over 130 gallons per student per day. The high number was from a school that has now made MAJOR repairs to a basket case of a plumbing system. High schools should be at the high end of the table above, while most elementary schools can use under 10 gallons per student per day.

Office Buildings

End Use/Benchmark Measure	N***	Efficiency Benchmark Range*
INDOOR USE		
Gal./sf/year	62	9 - 15
Gal./employee/day	72	9 - 16
COOLING USE**		
Gal./sf/year	49	8.5 - 22
IRRIGATION USE**		
Inches per year	47	26 - 50
TOTAL WATER USE**		
Gal./sf/year	62	26 - 35

* Developed from combined methods (field studies, audit data, and modeling results).
** Appropriate benchmarks will depend upon local climate.
***Sample size.

[1] Information provided by Bill Hoffman, City of Austin, Water Conservation Department (2001).

Schools

End Use/Benchmark Measure	N***	Efficiency Benchmark Range*
INDOOR USE		
Gal./ sf /year	142	8 - 16
Gal./school day/student	141	3 - 15
COOLING USE**		
Gal./ sf /year	35	8 - 20
IRRIGATION USE**		
Inches per year	132	22 - 50
TOTAL WATER USE**		
Gal./ sf /year	142	40 - 93

* Developed from combined methods (field studies, audit data, and modeling results).
** Appropriate benchmarks will depend upon local climate.
*** Sample size.

Bench mark indices continued

Food Service

End Use/Benchmark Measure	N***	Efficiency Benchmark Range*
INDOOR USE		
Gal./sf/year	142	8 - 16
Gal./school day/student	141	3 - 15
COOLING USE**		
Gal./sf/year	35	8 - 20
IRRIGATION USE**		
Inches per year	132	22 - 50
TOTAL WATER USE**		
Gal./sf/year	142	40 - 93

* Developed from combined methods (field studies, audit data, and modeling results).
** Appropriate benchmarks will depend upon local climate.
***Sample size.

APPENDIX J

REQUEST FOR ASSISTANCE

PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

Investing in our communities through improved energy efficiency in public buildings is a win-win opportunity for our communities and the State. Energy-efficient buildings reduce energy costs, increase available capital, spur economic growth, and improve working and living environments. The Preliminary Energy Assessment Service provides a viable strategy to achieve these goals.

Description of the Service

The State Energy Conservation Office (SECO) through its engineering consultants will analyze electric, gas and other utility data and work with ***Laguna Madre Water District (LMWD),*** hereinafter referred to as Partner, to identify energy cost-savings potential. To achieve this potential, SECO and Partner have agreed to work together to complete an energy assessment of mutually selected facilities.

SECO agrees to provide this service at no cost to the Partner with the understanding the Partner is ready and willing to consider implementing the energy savings recommendations.

Principals of the Agreement

Specific responsibilities of the partner and SECO in this agreement are listed below:

- Partner will select a contact person to work with SECO and its contractor to establish an Energy Policy and set realistic energy efficiency goals.
- SECO's contractor will go on site to provide walk through assessments of selected facilities.
- SECO will provide a report, which identify no cost/low cost recommendations, Capital Retrofit Projects, potential sources of funding.
- Partner will schedule a time for SECO's contractor to make a presentation of the assessment findings and recommendations to key decision makers.

Acceptance Of Agreement

This agreement should be signed by your organization's chief executive officer or other upper management staff.

Signature: _____ Date: 12 Aug 08

Name (Mr./Ms./Dr.) Mr. Gavino Sotelo Title: General Manager

Entity: Laguna Madre Water District (LMWD) Phone: (956) 943-2626

Street Address: 105 Port Road Fax: (956) 943-6827

Mailing Address: E-mail: gsotelo@lmwd.org

Laguna Madre Water District

105 Port Road

Port Isabel Texas, 78578

CONTACT INFORMATION:

Name (Mr./Ms./Dr.): Ms. Maribel Hinojosa Title: Assistant to the General Manager

Phone: (956) 943-2626 Fax: (956) 943-6827

Mail: mhinojosa@lmwd.org

Please Sign and mail or fax to the following SECO Consultant : Texas Energy Engineering Services, Inc. (TEESI), ATTENTION: Saleem Khan, P.E., 1301 Capital Of Texas Highway #B-325, Austin, TX. 78746, Phone 512-328-2533, **Fax 512-328-2544.** If you need to contact the State Energy Conservation Office, please call **Theresa Sifuentes at 512-463-1896** or you may write to her at: Comptroller Of Public Accounts, State Energy Conservation Office, 111 E. 17th Street, Austin, Texas 78774.