Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Waelder ISD

201 US Hwy 90 West
Waelder, Texas 78959

Prepared by:

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SECO
State Energy Conservation Office

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SECO - Schools & Local Government Energy Management Program
Waelder ISD
201 US Hwy 90 West
Waelder, Texas 78959
Contact Person: Mark Weisner, Superintendent
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1.0 EXECUTIVE SUMMARY

Waelder Independent School District, now referred to as the District, requested that Texas Energy Engineering Services, Inc. (TEESI) perform a Preliminary Energy Assessment (PEA) of their facilities. This report documents that analysis.

This service is provided at no cost to the District through the Schools Energy Management and Technical Assistance 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 Texas schools for the purpose of planning, funding, and implementing energy saving measures, which will ultimately reduce the District's annual energy costs.

The annual cost savings, implementation cost estimate and simple payback for all Utility Cost Reduction Measures (UCRM's) identified in this preliminary analysis are summarized below. Individual UCRM's are summarized in Section 8.0 of this report.

Est. Implementation Cost Estimate:	$59,100
Est. Annual Energy Saving (MMBTU/Yr):	322
Est. Annual Greenhouse Gas Emissions Reduction (Metric Tons CO_2e/Yr):	57
Est. Annual Energy Cost Savings:	$9,800
Simple Payback (Yrs):	6.0

This report includes a summary of the facilities surveyed along with energy consumption and costs, opportunities for energy savings, and information regarding energy management and options for funding retrofit projects. A follow-up visit to the District 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 the District may require in planning, funding and implementing the recommendations of this report. The District is encouraged to direct any questions or concerns to either of the following contact persons:

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

TEESI / Saleem Khan
(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). A description of each facility is provided below.

Buildings:	Waelder Elementary
Stories:	Single story
Area (estimated):	11,079 SF
Bldg. Components:	Brick building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	T8 Fluorescent fixtures with electronic ballasts T12 fluorescent fixtures with magnetic ballasts
HVAC:	Split-DX units with electric heat
Controls:	Programmable thermostats

Buildings:	Waelder Jr. High School
Stories:	Single story
Area (estimated):	11,223 SF
Bldg. Components:	Brick building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	T8 fluorescent fixtures with electronic ballasts
HVAC:	Split-DX units with electric heat
Controls:	Programmable thermostats

Buildings:	Waelder High School
Stories:	Single story
Area (estimated):	16,570 SF
Bldg. Components:	Brick building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	T8 fluorescent fixtures with electronic ballasts
HVAC:	Split-DX units with electric heat
Controls:	Programmable thermostats

Buildings:	Cafeteria
Stories:	Single story
Area (estimated):	3,746 SF
Bldg. Components:	Brick building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	T8 fluorescent fixtures with electronic ballasts T12 fluorescent fixtures with magnetic ballasts
HVAC:	Split-DX units with electric heat
Controls:	Standard thermostats

Buildings:	New Gym/Central Offices
Stories:	Single story
Area (estimated):	4,551 SF
Bldg. Components:	Brick building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	T8 fluorescent fixtures with electronic ballasts
	High Intensity Discharge (HID) fixtures in gym
HVAC:	Packaged rooftop units, Split-DX units with electric heat
Controls:	Programmable thermostats

3.0 ENERGY CONSUMPTION AND PERFORMANCE

A site survey was conducted at several of the District's facilities. The facilities surveyed have a total gross area of approximately 60,614 square feet.

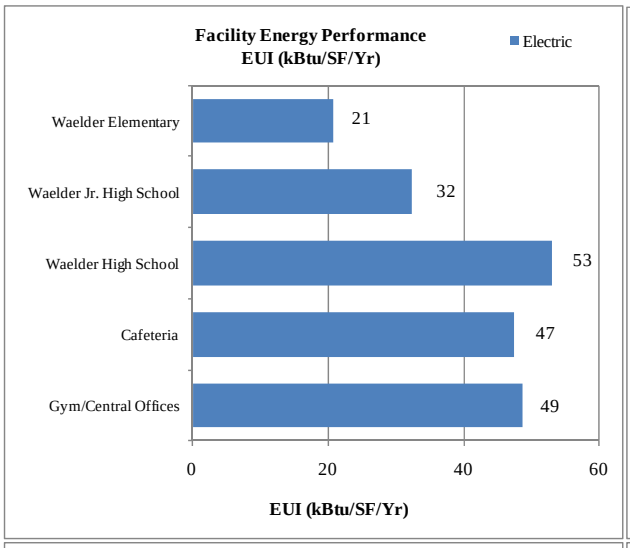
Annual electric invoices for the buildings surveyed were $76,892 for the 12-month period ending February 2011. A summary of annual utility costs is provided in **Appendix C**, Base Year Consumption History.

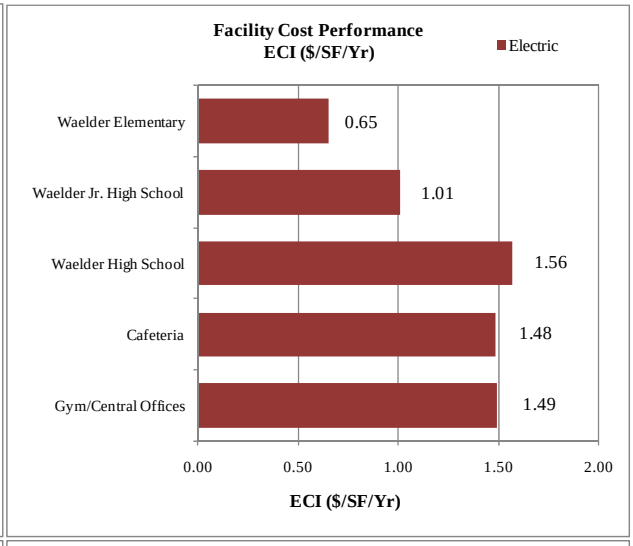
To help the District evaluate the overall energy performance of its facilities, TEESI has calculated their Energy Utilization Index (EUI) and Energy Cost Index (ECI). The EUI represents a facility's annual energy use density in thousands of BTUs per square foot per year (kBTU/SF/Year). Similarly, ECI is expressed as cost per square foot per year ($/SF/Year). The EUI and ECI for selected facilities are listed below:

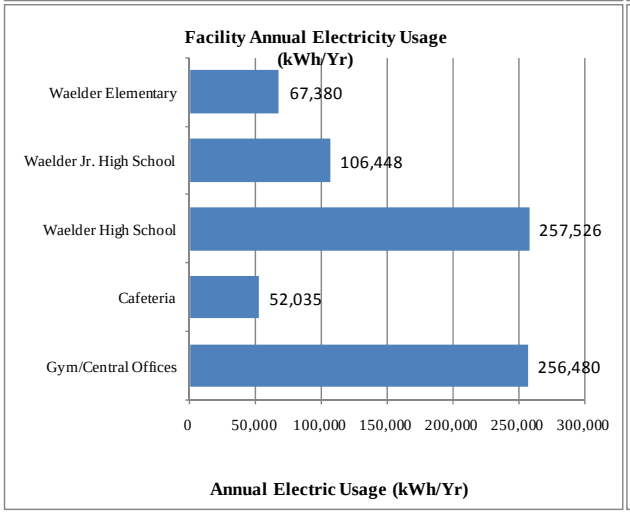
Energy Cost and Consumption Benchmarks								
		Electric				EUI	ECI	
	Building	kWh/Yr	MMBTU/Yr	kWh/SF	$Cost/Yr	kBTU/SF/Yr	$/SF/Yr	SF
1	Waelder Elementary	67,380	230	6.08	7,236	21	0.65	11,079
2	Waelder Jr. High School	106,448	363	9.48	11,291	32	1.01	11,223
3	Waelder High School	257,526	879	15.54	25,931	53	1.56	16,570
4	Cafeteria	52,035	178	13.89	5,562	47	1.48	3,746
5	Gym/Central Offices	256,480	875	14.25	26,872	49	1.49	17,996
		kWh/Yr	MMBTU/Yr	kWh/SF	$Cost/Yr	kBTU/SF/Yr	$/SF/Yr	SF
		739,869	2,525	12.21	76,892	42	1.27	60,614

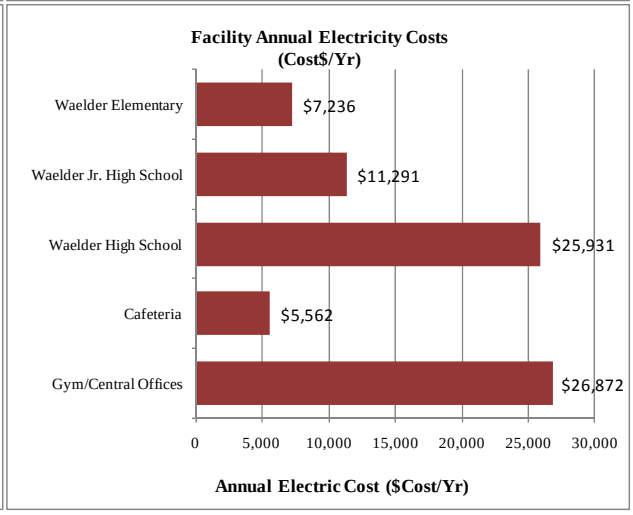
Knowing the EUI and ECI of each facility is useful to help determine the District's overall energy performance. In addition, the District's EUI was compared to TEESI's database of Texas schools. See **Appendix D** to determine how the EUIs of these facilities compared to those of other schools in Texas.

The following charts summarize the data presented in the previous table. See **Appendix C** for further detail.

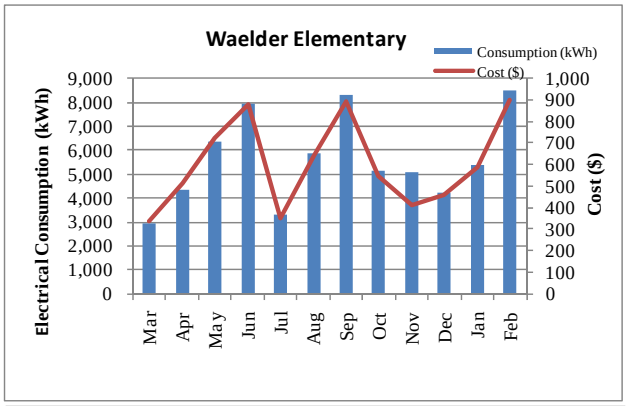


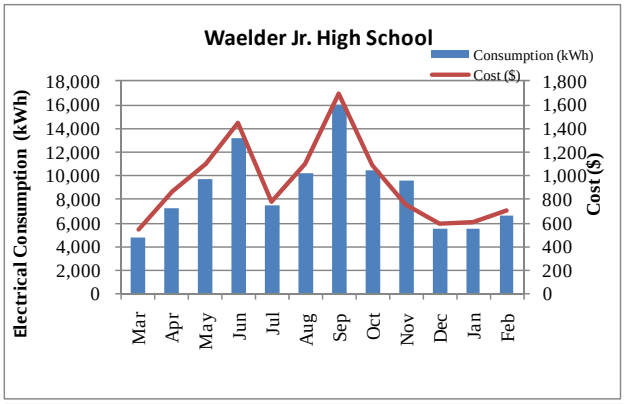


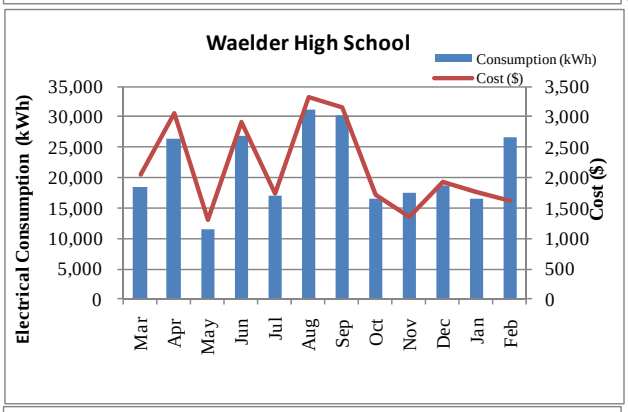


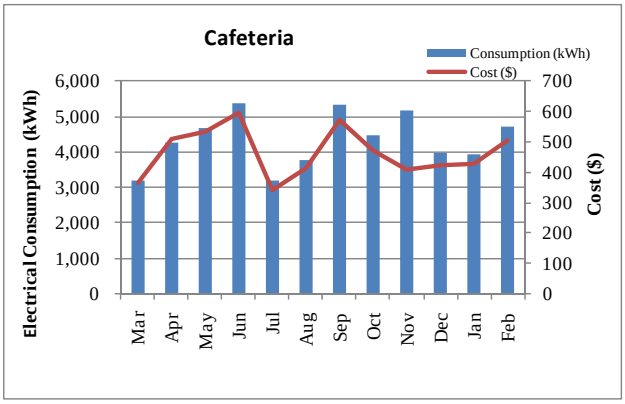


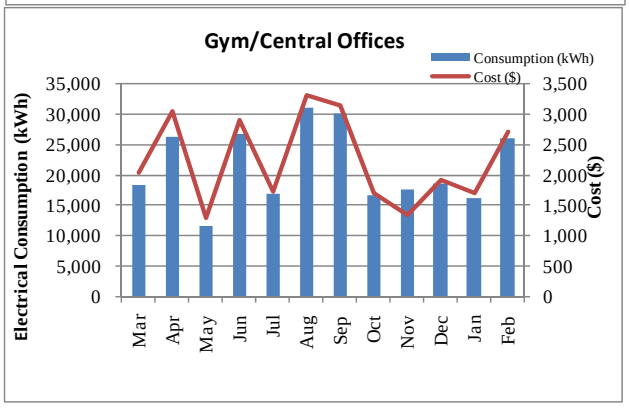
The following charts summarize each campus' monthly utility data. See **Appendix C** for further detail.











As seen in the charts above, electric consumption generally peaks during the months of August and September. Some general recommendations for reducing these peaks include:

- During equipment startup for the upcoming school year in August and September, be mindful of operating HVAC equipment during unoccupied times (nights and weekends) and at unnecessarily low temperatures.
- Installing motion sensors for lighting control to prevent unnecessary lighting on at once (see Section 8.0).
- Increasing temperature setpoints in the summer and decreasing them in the winter to reduce unit cycle times.

4.0 ENERGY STAR PORTFOLIO MANAGER

The District's energy baseline can be developed in ENERGY STAR's Portfolio Manager. One of the key reasons for using ENERGY STAR Portfolio Manager is its ability to normalize the District's baseline according to several key factors (i.e. Weather, Square Feet, Hours of Operation, Number of Computers, etc.). It is also a free online resource available to all registered users, and is a user-friendly web-based tool.

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). ENERGY STAR has developed Portfolio Manager, an innovative online energy management tool, designed to help organizations track and assess energy and water consumption of their facilities. Portfolio Manager helps organizations set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

Portfolio Manger is an energy performance benchmarking tool. Portfolio Manager rates a building's energy performance on a scale of 1–100 relative to similar buildings nationwide. The rating system is based on a statistically representative model utilizing a national survey conducted by the Department of Energy's Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years, and gathers data on building characteristics and energy use from thousands of buildings across the United States. A rating of 50 indicates that the building, from an energy consumption standpoint, performs better than 50% of all similar-use buildings nationwide, while a rating of 75 indicates that the building performs better than 75% of all similar-use buildings nationwide.

In addition, Portfolio Manager is used to generate a Statement of Energy Performance (SEP) for each building, summarizing key energy information such as site and source energy intensity, greenhouse gas emission, energy reduction targets and energy cost. The Statement of Energy Performance can help in applying for an ENERGY STAR Building label or satisfying LEED for Existing Buildings (LEED-EB) requirements. For example, one of the requirements to receive an ENERGY STAR Building Label is to achieve a minimum CBECS rating of **75**. A requirement to receive LEED-EB certification is an ENERGY STAR rating of **69**.

To develop the District's baseline, 12 months of utility consumption, cost data, and Building Space Use information will be required. The table on the following page is a sample of the Building Space Use data required by Portfolio Manager to generate the Energy Performance Rating. These inputs are critical and can significantly influence how Portfolio Manager computes the ENERGY STAR Rating. Many of these key inputs may vary over time and could influence the rating. **If an ENERGY STAR Label is pursued, these key inputs will need to be verified and certified by a Professional Engineer. Verification of this information is required when submitting the Statement of Energy Performance for ENERGY STAR's review.**

ENERGY STAR Portfolio Manager Example Space Use Data

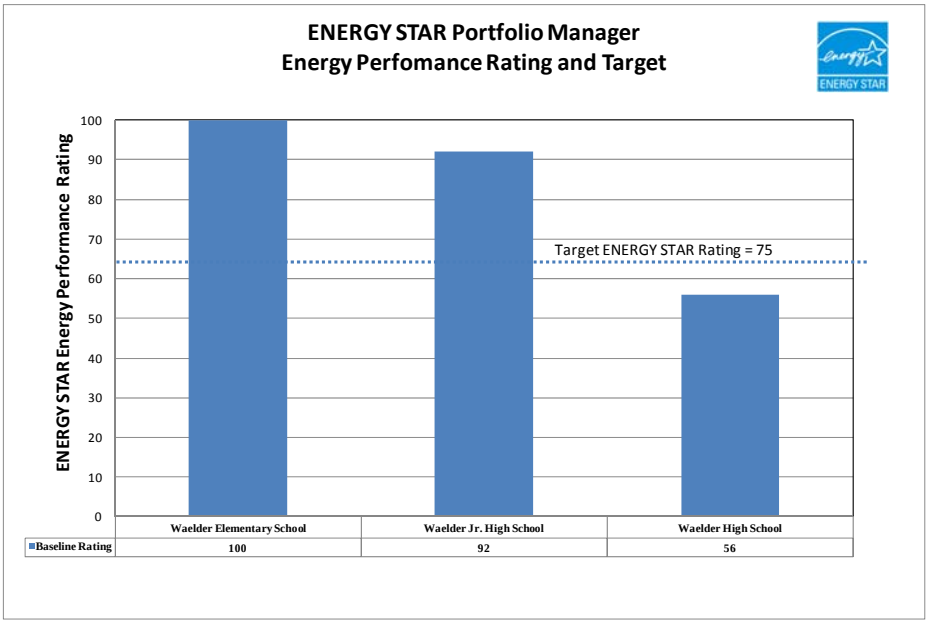
Facility Type: K-12 School

- 12 Months of Electric
- Gross Floor Area
- Open Weekends (Y/N)
- # of PCs
- # of Walk in refrigerators/freezers units
- Presence of cooking facilities
- Percent Cooled
- Percent Heated
- Months Open per Year
- High School (Y/N)

Each facility at the District was analyzed through the ENERGY STAR Portfolio Manager. **Default** values were used for the data in the table above except for utility bills and gross floor areas. It is recommended the District update these to correct values for each facility in order to achieve appropriate ENERGY STAR ratings. The table below summarizes the preliminary results based on some default values.

Facility Name	Current Rating (1-100)	Total Floor Space (Sq. Ft.)
Waelder Elementary School	100	11,079
Waelder Jr. High School	92	16,570
Waelder High School	56	11,223

The target for each of these schools is a rating of 75 to qualify for ENERGY STAR. As previously noted, engineer verification is required to produce a Statement of Energy Performance (SEP)* if applying for ENERGY STAR recognition. The following indicates the school's current energy performance ratings compared to a rating of 75, ending in February 2011.



ENERGY STAR ratings for February 2011

*ENERGY STAR Statement of Energy Performance includes verification of additional Industry Standards criteria, such as acceptable ventilation for indoor air quality, acceptable thermal environmental conditions, and adequate lighting levels.

A benefit of using ENERGY STAR's Portfolio Manager is its ability to set goals for energy performance. It allows an energy performance target to be set and calculates the estimated savings per year to reach the goal. With a performance target of 75 set, the estimated yearly savings for the High School is indicated below.

	ENERGY STAR Rating			ENERGY STAR Rating Target			ENERGY STAR Rating Target		
	EXISTING RATING = 56			TARGET RATING = 69			TARGET RATING = 75		
Facility	Current Utility Cost $/SF/yr	Potential Target Savings $/yr	Greenhouse Gas Emissions ($MtCO_2e/yr$) / ($kgCO_2e/ft^2/yr$)	Target Utility Cost $/SF/yr	Potential Target Savings $/yr	Greenhouse Gas Emissions (MtCO2e/yr) / (kgCO2e/ft2/yr)	Target Utility Cost $/SF/yr	Potential Target Savings $/yr	Greenhouse Gas Emissions (MtCO2e/yr) / (kgCO2e/ft2/yr)
Waelder High School	$1.56	-	147 / 9	$1.38	$2,934	130 / 8	$1.29	$4,416	122 / 7

The District's cafeteria and gymnasium are used by various grade levels, and are currently not available for an ENERGY STAR rating separately. However, the District can continue to utilize the energy tracking, accounting, and goal setting aspects of Portfolio Manager for these facilities.

5.0 ENERGY ACCOUNTING

UTILITY PROVIDERS

City of Waelder provides electric service to the District.

MONITORING AND TRACKING

Currently, the District does not have an energy tracking software or spreadsheet in place. An effective energy 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 and milestones.

The District should consider consolidating the tracking and recording of all the District's utility accounts (i.e., Electricity, Natural Gas, Propane, Water, etc.) into an electronic spreadsheet similar to the chart shown on the following page. Along with total utility costs ($), utility consumption should be recorded as well (i.e., kWh, MCF, gallons, etc.). The District can use this data to track utility consumption patterns and budget utility expenses. **Preferably, the District should also consider an electronic database such as ENERGY STAR Portfolio Manager, which will provide a means of storing and tracking utility information. The District's baseline utility information has been entered into Portfolio Manager, as shown in the previous section. For more information on ENERGY STAR Portfolio Manager, please see Section 4.0.** Posting this historical data improves awareness of the District's energy performance and will help in tracking and publicizing energy reduction progress.

The steps below are essential for an effective energy management tracking system:

1. Perform regular updates. An effective system requires current and comprehensive data. Monthly updates should be strongly encouraged.

2. Conduct periodic reviews. Such reviews should focus on progress made, problems encountered, and potential rewards.

3. Identify necessary corrective actions. This step is essential for identifying if a specific activity is not meeting its expected performance and is in need of review.

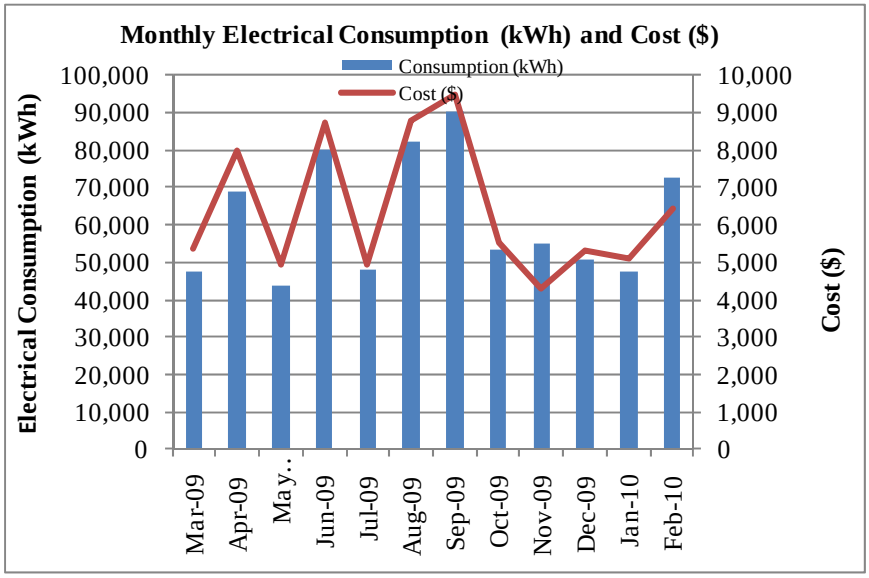
In addition, having this historical utility data would facilitate **House** and **Senate Bill(s)** reporting requirements. Please see Section 6.0 for additional information regarding these requirements.

Following is a sample format the District can customize to help summarize their overall utility usage and costs. The data in it is a summation of the data provided by the District. It includes only selected utility accounts and is for reference purposes only, as it does not represent the District's total utility data. See **Appendix C** for further detail regarding each utility account represented in the table below.

Waelder ISD - Sample Utility Input Form

MONTH	ELECTRICITY		
	KWH	COST $	Avg. Rate $/KWH
Mar-09	47,695	5,348	$0.1121
Apr-09	68,710	8,009	$0.1166
May-09	43,824	4,955	$0.1131
Jun-09	79,984	8,735	$0.1092
Jul-09	47,912	4,945	$0.1032
Aug-09	82,304	8,780	$0.1067
Sep-09	90,246	9,475	$0.1050
Oct-09	53,363	5,528	$0.1036
Nov-09	55,007	4,283	$0.0779
Dec-09	50,980	5,316	$0.1043
Jan-10	47,372	5,083	$0.1073
Feb-10	72,472	6,436	$0.0888
Total	739,869	$76,892	$0.1039

Gross Building Area:	60,614	SF



6.0 ENERGY LEGISLATION OVERVIEW

In 2007, the 80th Texas Legislature passed Senate Bill 12 (**SB12**), which extended the timeline set by Senate Bill 5 (**SB5**). SB5, commonly referred to as the Texas Emissions Reduction Plan, was adopted in 2001 by the 77th Texas Legislature to comply with the federal Clean Air Act standards. Also in 2007, the 80th Texas Legislature passed House Bill 3693 (**HB3693**), which amended provisions of several codes relating primarily to energy efficiency.

In 2009, the 81st Texas Legislature passed Senate Bill 300 (**SB300**). This bill specifically addressed the requirement for Texas Schools. This bill repealed the requirement in HB3693 that school districts must establish a goal of reducing electric consumption by 5% each year for six years starting Fiscal Year (FY) 2007. SB300 instead requires that school districts establish a long-range energy plan to reduce the overall electricity use by 5% beginning FY 2008. Besides this change, other requirements set forth in SB12 and HB3693 applicable to schools still apply.

Following are key requirements established by the above energy legislation:

- Establish a Long-Range Energy Plan (SB300) to reduce the District's electric consumption by five percent (5%) beginning with the 2008 state fiscal year and to consume electricity in subsequent fiscal years in accordance with the plan. The Long-Range Energy Plan should include strategies in the plan for achieving energy efficiency that result in net savings or that can be achieved without financial cost to the district. The Plan should account for the initial, short-term capital costs and lifetime costs and savings that may occur from implementation of the strategy. Each strategy should be evaluated based on the total net costs and savings that may occur over a seven-year period following implementation of the strategy.

- 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. To help with the utility reporting process, a sample input form can be found in **Appendix B** of this report.

- Purchase commercially available light bulbs using the lowest wattages for the required illumination levels.

- Install energy saving devices in Vending Machines with non-perishable food products. **Not required of School Districts, but highly recommended.**

Summary descriptions of SB12, HB3693, and SB300 are available in **Appendix A.**

7.0 RECOMMENDED MAINTENANCE & OPERATION PROCEDURES

Good Maintenance and Operation procedures significantly improve operating economy, equipment life, and occupant comfort. Generally, maintenance and operation procedural improvements can be made with existing staff and budgetary levels. Below are typical maintenance and operation procedures that have energy saving benefits. The District may already be following some of the recommendations noted below. The following maintenance and operation procedures should be encouraged and continued to ensure sustainable energy savings.

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.

MANAGE SMALL ELECTRICAL EQUIPMENT LOADS

Small electrical equipment loads consists of small appliances/devices such as portable heaters, microwaves, small refrigerators, coffee makers, stereos, cell phone chargers, desk lamps, etc. The District should establish a goal to reduce the number of small appliances and to limit their usage. For example, the use of small space heaters should be discouraged; hence, all space heating should be accomplished by the District's main heating system. In addition, many small devices such as radios, printers, and phone chargers can consume energy while not in use. To limit this "stand-by" power usage these devices should be unplugged or plugged into a power strip that can act as a central "turn off" point while not in use. With an effective energy awareness campaign to encourage participation, managing small electrical loads can achieve considerable energy savings.

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.

PRE-IDENTIFY PREMIUM EFFICIENCY MOTOR (PEM) REPLACEMENTS

Pre-identify supply sources and PEM stock numbers for all HVAC fan and pump motors so that as failures occur, replacement with PEM units can take place on a routine basis. As funding allows, pre-stock PEM replacements according to anticipated demand, i.e., motors in service more than 10 years, motors in stressful service, and particular motor types that are in service at several locations.

IMPROVE CONTROL OF INTERIOR & EXTERIOR LIGHTING

Establish procedures to monitor use of lighting at times and places of possible/probable unnecessary use: Offices and classes at lunchtime, maintenance shops, closets, exterior, and parking lots during daylight hours, etc. Encouraging staff (i.e. Teacher, Custodial, maintenance, and students) to participate in the District's efforts to limit unnecessary lighting use would help improve this effort.

Example 1 – Day Lighting Opportunity: The picture below is a good example of a day lighting opportunity. The buildings' windows placed along the corridor of the High School and Middle

School help bring in sufficient natural light to illuminate the space during school hours. The District should consider reducing the amount of artificial lighting in areas where sufficient natural light is available.

High School/Middle School hallway: 102 foot-candles with lights on and daylight.

Example 2 - Gym Lights: The picture below is of the High Intensity Discharge (HID) Lights in the gymnasium. During the walkthrough, the lights were on during an unoccupied period. The District should establish a procedure to reduce the time gym lighting is left on during unused periods and consider utilizing natural light from the windows and doors. A good energy awareness campaign, a collective effort, and good communication will help ensure the success of this no/low cost energy saving strategy. In addition, because of the long re-strike periods of HID lighting, they cannot be effectively turned off and on during unoccupied times. For retrofit recommendations, please see Section 8.0.

Gymnasium lights on during unoccupied hours.

SEPARATELY SCHEDULE TEMPERATURE CONTROL AND VENTILATION

It is typically necessary to start equipment and establish temperature control an hour or more before occupancy. However, unless Night Flushing or Airside Economizing is in use (see

definitions below), ventilation with outdoor air should not be provided except while the space is occupied or exhaust systems are operating. At other times, fresh air may be heated or cooled needlessly, and humid outside air may also raise the indoor humidity at a time when the cooling load is too low to produce sufficient dehumidifying effect from the cooling system.

In cool, dry weather, if the control system has sufficient reliability and capability, ventilation may be used to reduce the cost of cooling. "Night flushing" is the use of cool air to reduce early morning pre-cooling energy. "Airside Economizing" is the replacement of return air with outdoor air when and to the extent that it reduces the cooling requirement of the space. If these strategies are used, the outdoor humidity reading must be reliable, which typically takes at least two humidity sensors, well placed and automatically cross-calibrated. One set of such sensors can supply the necessary information to all air systems on a common control network.

TYPICAL EQUIPMENT MAINTENANCE CHECKLISTS

Effective operation and maintenance of equipment is one of the most cost effective ways to achieve reliability, safety, and efficiency. Failing to maintain equipment can cause significant energy waste and severely decrease the life of equipment. Substantial savings can result from good operation and maintenance procedures. In addition, such procedures require little time and cost to implement. Examples of typical maintenance checklists for common equipment including are provided in **Appendix E**. These checklists from the Federal Energy Management Program (FEMP), a branch of the Department of Energy (DOE), are based on industry standards and should supplement, not replace those provided by the manufacturer.

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 in hot, humid or very cold weather, contributes to higher energy consumption and reduces occupant comfort.

REPLACE INCANDESCENT LAMPS WITH COMPACT FLUORESCENTS

Replace existing incandescent lamps with compact fluorescent lamps 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.

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 hibernate 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.

INSTALL ENERGY SAVING DEVICES ON VENDING MACHINES

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. There are several commercially available devices that can be easily installed on existing vending machines. These devices typical have a motion sensor which powers 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.

HAIL GUARDS ON CONDENSING AND PACKAGED ROOFTOP UNITS

When an HVAC unit is replaced the District should ensure the new unit be specified with hail guards. The hail guards protect the condensing unit's heat exchanger coils from hail damage. Damage to the condensing unit heat exchangers reduces the efficiency of the units. If any existing unit(s) have damaged condensing coil fins, the fins should be straightened using a fin comb.

EXTERIOR SECURITY AND SITE LIGHTING RETROFIT

Some areas in the District utilize High Intensity Discharge (HID) fixtures for exterior lighting. It is recommended that the District replace the existing HID fixtures with a combination of Pulse Start Metal Halide (MH), Light-Emitting Diode (LED), and Compact Fluorescent (CFL) fixtures suitable for the applications. Care should be used when developing a retrofit/replacement strategy so that minimum security lighting levels are not sacrificed when the retrofit is complete. Therefore, lighting levels should be calculated to determine if the post-retrofit levels are acceptable. 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 lamps with greater lumen maintenance can have sustainable energy savings with minimal impact. The following table lists several retrofit possibilities.

SECURITY/SITE LIGHTING RETROFIT STRATEGY

Existing Fixture	Existing Example Lamp Type and Wattage	Retrofit Scope	Retrofit Lamp Type and Wattage
Pole Light (*)	400W HID	Lamp/Ballast Replacement	320W MH
Pole Light, Short (*)	250W HID	Lamp/Ballast Replacement	200W MH
Security Wall Pack	150W/175W HID	LED Security Wall Pack Fixture Replacement	56W LED
Security Wall Pack, Low	70 HID	LED Security Wall Pack Fixture Replacement	26W LED
Security Wall Pack, Flood	250 HID	Lamp/Ballast Replacement	200W MH
Surface Mount	150W/175W HID	LED Surface Mount Fixture Replacement	56W LED
Recessed	70 HID	Lamp Replacement with CFL	50W CFL
Incandescent Wall	100W Incandescent	Lamp Replacement with CFL	26W CFL

(*) LED fixture replacements are becoming more cost effective

8.0 UTILITY COST REDUCTION MEASURES

Utility Cost Reduction Measures (UCRMs) projects identified during the preliminary analysis are detailed below. Project cost estimates include complete design and construction management services.

T12 TO T8 FLUORESCENT LIGHTING RETROFIT

The District has a combination of T8 and T12 Fluorescent fixtures. It is recommended the District replace the existing T12 fluorescent lamps and magnetic ballasts with high efficiency T-8 fluorescent lamps and electronic ballasts. A typical four-foot, two-lamp (34W) fixture with magnetic ballast requires approximately 75 watts, while two F28T8 lamps with electronic ballast in the same fixture configuration require only 55 watts (73% as much energy) and produce 95% as much light. The table below indicates the facilities where T-12 fluorescent lamps were observed during the preliminary walkthrough. The cost and savings noted below are based on preliminary observations of the facilities. Exact cost, quantities, and lamp types can be identified through a detailed energy audit. In addition, a detailed lighting design calculation will help ensure the appropriate lighting replacement is selected. For example, a detailed design calculation may identify areas that could operate with fewer lamps per fixture or with low-wattage T8 lamps while still maintaining adequate lighting levels. The cost and savings calculations below are based on 48" F28T8, extended life linear fluorescent lamps and one ballast per fixture. Lamp and ballast recycling is included in the cost estimates.

T12 TO T8 FLUORESCENT LIGHTING RETROFIT				
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
Waelder Elementary	$2,100	$400	13	5.3
Cafeteria	$1,400	$400	13	3.5
TOTAL	**$3,500**	**$800**	**26**	**4.4**

REPLACE EXISTING T8 FLUORESCENT LAMPS WITH LOWER WATTAGE LAMPS

Low-wattage T8 fluorescent lamps are available in 30, 28 and 25-watt versions. It is recommended the District replace existing 32-watt T8 Fluorescent lamps with lower wattage lamps in most cases. However, lower wattage T8 lamps have reduced lighting levels, so it is important to ensure that recommended lighting levels are maintained. Existing lighting levels should be measured to provide a basis for projecting post-retrofit lighting levels. 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 reduce energy use by about 12% while reducing the lighting level only about 4%.

The estimated costs and savings noted below are based on replacement of existing 32-watt T8 lamps and does not account for ballast replacements. Estimates are based on a preliminary walkthrough of the facilities. A detailed lighting analysis will be required to determine exact cost, quantities, and configuration to maximize the energy savings and lighting performance. The cost and savings calculations below are based on 48" F28T8, extended life linear fluorescent lamps. Lamp recycling is included in the cost estimates.

T8 TO LOW WATTAGE T8 FLUORESCENT LIGHTING RETROFIT				
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
Waelder Jr. High School	$2,600	$600	19	4.3
Waelder High School	$3,900	$1,100	37	3.5
Cafeteria	$400	$100	3	4.0
Gym/Central Offices	$2,500	$700	23	3.6
TOTAL	**$9,400**	**$2,500**	**82**	**3.8**

GYMNASIUM HID TO FLUORESCENT FIXTURE LIGHTING RETROFIT

The New Gym in the District utilizes High Intensity Discharge (HID) fixtures for light. It is recommended that the District replace the existing HID fixtures with T5HO fluorescent fixtures suitable for gym applications. Fluorescent fixtures offer improved control, reduce energy consumption, and improve lighting levels. In addition, due to the long re-strike times associated with HID fixtures, they cannot be effectively switched on/off during unoccupied periods. This causes the HID lamps to operate longer, which both consumes more energy and affects lamp life. The District can also consider utilizing fluorescent fixtures supplied with integrated occupancy sensors for improved lighting control. The cost and savings estimates below are based on preliminary observations and analysis. Note that fixtures selected for unheated spaces or where subject to abuse (like gyms) will require special features.

HID TO FLUORESCENT LIGHTING RETROFIT				
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
Gym/Central Offices	$12,600	$1,800	59	7.0
TOTAL	**$12,600**	**$1,800**	**59**	**7.0**

INSTALLATION OF OCCUPANCY SENSORS FOR INDOOR LIGHTING CONTROL

The District should consider installing occupancy sensors to improve the control of interior lighting. Occupancy sensors will help ensure lights are only on when the space is occupied. The table below provides estimated costs and energy savings for the installation of these sensors. Please note these estimates are based on a preliminary assessment. Exact sensor locations, technology (Infrared, Ultrasonic, and Dual Technology), and quantity can be determined during a detailed energy assessment or design phase. In general, enclosed areas with intermittent use are typically good candidates for occupancy sensors (e.g. classrooms, offices, break rooms, and conference rooms). The costs below reflect ceiling mounted occupancy sensors.

MOTION SENSOR INSTALLATION				
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
Waelder Jr. High School	$2,000	$300	10	6.7
Waelder High School	$1,800	$300	10	6.0
Gym/Central Offices	$1,100	$200	7	5.5
TOTAL	**$4,900**	**$800**	**27**	**6.1**

REPLACE CONDENSING UNITS

Replace existing condensing units with new high efficiency units at the facility indicated in the table below. The existing systems are inefficient and are beyond their useful life. Units to be replaced consist of two (2) condensing units at the Cafeteria totaling approximately 6 tons. The average system age is 23 years. The table below summarizes the estimated cost and savings for replacing the units indentified in the school.

CONDENSING UNIT REPLACEMENT				
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
Cafeteria	$7,200	$400	13	18.0
TOTAL	**$7,200**	**$400**	**13**	**18.0**

INSTALL NETWORKED THERMOSTATS

The District facilities currently utilize standard and programmable thermostats for HVAC equipment control. During the initial site visit, several of the District's HVAC units were operating during unoccupied hours. The following pictures depict thermostats currently in cooling mode in classrooms which were unoccupied. These pictures were taken during the month of June 2011.

Thermostat controlling classroom at High School. Temperature setpoint is 71 °F.

Thermostat controlling classroom at Elementary School. Temperature setpoint is 69 °F.

Low thermostat settings in summer (below about 72°F) and high settings in winter (above about 68°F) increase building cooling/heating loads and unit run times. This in turn increases utility costs and reduces unit life. When more cooling is deemed necessary for high occupancy events, ensure normal settings are restored afterward. The photos above show unnecessarily low thermostat settings (69°F and 71°F) for observed unoccupied areas at the Elementary and High Schools. A temperature change of one degree during occupied hours can result in savings as much as 1 – 3%.

Installing web-based networked thermostats would provide improved control of the air-conditioning systems throughout the facilities listed in the table below, as well as allow for multiple schedule routines and remote scheduling. The thermostat networks would be connected to the District's data or control network and could be controlled and monitored from a central location.

NETWORKED THERMOSTATS				
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
Waelder Elementary	$6,000	$500	16	12.0
Waelder Jr. High School	$4,000	$300	10	13.3
Waelder High School	$7,000	$2,000	68	3.5
Cafeteria	$1,500	$200	6	7.5
Gym/Central Offices	$3,000	$500	16	6.0
TOTAL	**$21,500**	**$3,500**	**116**	**6.1**

SUMMARY OF ENERGY COST REDUCTION MEASURES

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

SUMMARY OF ENERGY COST REDUCTION MEASURES				
Project Description	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Estimated Annual MMBTU Savings (MMBTU/yr)**	**Simple Payback (years)**
T12 TO T8 FLUORESCENT LIGHTING RETROFIT	$3,500	$800	26	4.4
T8 TO LOW WATTAGE T8 FLUORESCENT LIGHTING RETROFIT	$9,400	$2,500	82	3.8
HID TO FLUORESCENT LIGHTING RETROFIT	$12,600	$1,800	59	7.0
MOTION SENSOR INSTALLATION	$4,900	$800	27	6.1
CONDENSING UNIT REPLACEMENT	$7,200	$400	13	18.0
NETWORKED THERMOSTATS	$21,500	$3,500	116	6.1
TOTAL:	**$59,100**	**$9,800**	**322**	**6.0**

The above project implementation costs and annual savings are estimated based on a preliminary examination of the facilities. Furthermore, detailed assessment, contingency & any project administration costs and maintenance savings are not included in this preliminary energy assessment. 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. Construction administration would be provided by the engineering group who prepared the drawings and specifications.

9.0 FACILITY IMPROVEMENT MEASURES

This section describes facility improvement measures that have energy savings opportunities but cannot be justified solely based on the potential energy savings. The following are the facility improvement measures recommended for the District.

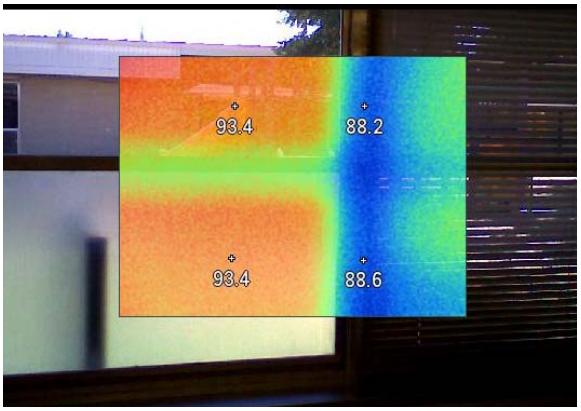
REPLACE HVAC SYSTEMS NEARING END OF USEFUL LIFE

The District has several Split-DX air-conditioning units nearing the end of their useful life. The average age of these systems is 23 years. The District should budget and plan to replace these units. Replacing these systems with new high efficiency units will have energy savings and help reduce maintenance costs. The HVAC systems nearing the end of their useful life consist of 7 Split-DX systems totaling approximately 17.5 tons at Waelder Jr. High School. The table below summarizes the estimated cost for replacing the units identified. The table below also includes two (2) Split-DX units at the Cafeteria totaling 6 tons (the condensing unit replacements were discussed in Section 8.0). However, these cost estimates include replacement of both the condensing unit and indoor unit.

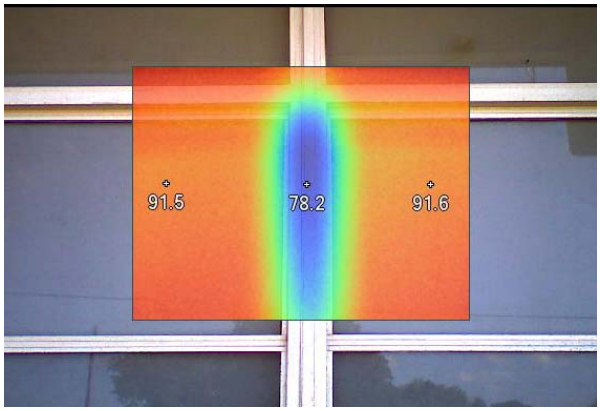
CAPITAL RETROFIT - HVAC REPLACEMENT	
Project Description	**Estimated Implementation Cost**
Waelder Jr. High School	$52,500
Cafeteria	$18,000
TOTAL	**$70,500**

REPLACE SINGLE-PANE WINDOWS WITH NEW ENERGY-EFFICIENT WINDOWS

It is recommended the District consider replacing existing single-pane windows with new energy-efficient windows. The thermal images below are of the Jr. High School windows, and depict the contrast between warmer and cooler areas. The existing windows excessively transmit heat conductively and radiantly, and even allow air and moisture to pass due to degradation of the weather seals, as shown in the following images. Replacing these windows with new energy-efficient, double-pane windows will improve the building envelope's thermal performance, improve air and moisture tightness, reduce sound transmission and enhance occupant comfort. The new energy efficient windows should meet ENERGY STAR qualifications. The following thermal images were taken during the month of August 2011.



Interior thermal image of window at Jr. High School



Exterior thermal image of window at Jr. High School

The table below provides an estimated cost to replace the windows at each facility.

CAPITAL RETROFIT - WINDOW REPLACEMENT	
Project Description	**Estimated Implementation Cost**
Waelder Elementary	$69,100
Waelder Jr. High School	$34,600
Cafeteria	$21,600
TOTAL	**$125,300**

10.0 ENERGY MANAGEMENT POLICY

By requesting this study, the District has demonstrated interest in taking a more aggressive approach to energy management. In order to establish an effective Energy Management Program it should have support from top management. An Energy Management Policy adopted by the school board sends a strong signal that energy management is an institutional priority. A formal Energy Management Policy can be as simple as a two-page document that clearly states the District's energy management objectives. The policy should cover items such as:

- who is accountable for energy management
- what your energy savings targets are
- how you will monitor, review and report on progress
- staffing and training to support the policy
- criteria for energy management investment
- working energy efficiency into new capital investments

Along with a clear energy **policy,** an energy management **plan** should be developed to ensure sustained energy savings. The energy management plan is a document that details roles, responsibilities, and objectives. Following are key items that should be included in an energy management plan:

1. ESTABLISH ROUTINE ENERGY TRACKING AND REPORTING PROCEDURES
   Establishing a procedure to monitor energy usage and cost will help identify energy use patterns. The data will also help determine the effectiveness of the Energy Management Program.

2. ESTABLISH AN ENERGY MANAGEMENT STEERING COMMITTEE
   The Energy Management Steering Committee will include representatives from a cross section of the District. 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 the District's energy cost and consumption. Regular meetings will ensure the Districts goals are being met prior to the end of the year.

3. PROMOTE ENERGY AWARENESS
   The energy management steering committee members shall establish a program to publicize the District's energy goals and progress on a quarterly or semiannually basis. For example, student drawn posters of the District's energy savings can be placed in hallways. This will encourage student involvement and act as an educational tool. Continuous promotion of the District's goals will ensure the sustainability of the energy management program and help achieve further energy savings.

4. ESTABLISH ACCEPTABLE EQUIPMENT PARAMETERS
   Establish a District-wide uniform temperature set point for all HVAC units. Having a standard setpoint will help keep HVAC runtimes to a minimum. The following are some suggested temperature settings, however, the district will need to monitor and ensure that other building parameters (humidity levels etc.) are within acceptable limits. Also, areas

with special equipment (MDF/IDF, server rooms, etc.) or materials (wood flooring, paper storage, etc.) should be maintained at the equipment suppliers' recommended settings and settings appropriate to the material.

Occupied Cooling Temperature Setpoints:

Instructional Areas	73 F – 76 F
Admin Areas	72 F – 76 F

Unoccupied Cooling Temperature Setpoints:

Instructional Areas	85 F
Admin Areas	85 F

Occupied Heating Temperature Setpoints:

Instructional Areas	67 F – 69 F
Admin Areas	67 F – 69 F

Unoccupied Heating Temperature Setpoints:

Instructional Areas	55 F
Admin Areas	55 F

5. DISALLOW OR DISCOURAGE PERSONAL APPLIANCES

Establish a policy that prohibits use of personal appliances by District staff, such as mini refrigerators and space heaters. Alternatively, establish disincentives such as a fee for use of such appliances. Collected fees could be used for energy awareness and management in other areas.

6. STAFF INCENTIVES AND RECOGNITION PROGRAM

Establishing a student, staff, and campus incentive and recognition program would help promote and encourage support from staff and custodial members. The District may consider implementing a staff incentive and recognition program. Following are some program examples.

- The energy accounting system can be used to monitor cost savings and compare it to the base year consumption. An energy incentive plan consisting of a 50-50 sharing with the school campus and the Energy Management Program could be employed. The school would get 50% of the savings resulting from energy cost reduction. The school would be free to use the money for educational programs such as materials, supplies, etc. The other 50% would be used for continuing energy management efforts. The following is an example of the Building savings summary report.

  EXAMPLE:

  High School - Annual Total Electric Cost

Baseline (2006 - 07)	Current (2007 - 08)	Savings	50% Savings
$248,483	$240,483	$8,000	$4,000

In this example, the High School saved $8,000 where 50% ($4,000) will be assigned to the school. This money would be paid in October of the following fiscal year.

- ❖ An energy flag program should be implemented. There would be three energy flags, one flag per each grade level. An energy flag would be awarded to the schools exhibiting the greatest percentage reduction in energy costs. Energy flags would be awarded on a rotating basis each summer. In order to provide motivation, maintain enthusiasm, and recognize individuals doing their part to save the District taxpayers money through the Energy Management Program, the local media (including district newsletters) should be informed of the energy flag results. The energy flags would be awarded in January and August of each year based on the energy consumption of the previous four months.

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

7. NEW BUILDING AND CONSTRUCTION

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.

8. ESTABLISH A WATER MANAGEMENT PROGRAM

Along with saving energy the District should establish a program to reduce water consumption. The following conservation measures should be employed.

a. Investigate the use of water conserving faucets, showerheads, and toilets in all new and existing facilities.
b. Utilize water-pervious materials such as gravel, crushed stone, open paving blocks or previous paving blocks for walkways and patios to minimize runoff and increase infiltration.
c. Employ Xeriscaping, using native plants that are well suited to the local climate, that are drought-tolerant and do not require supplemental irrigation.
d. Utilize drip irrigation systems for watering plants in beds and gardens.
e. Install controls to prevent irrigation when the soil is wet from rainfall.
f. Establish a routine check of water consuming equipment for leaks and repair equipment immediately.

11.0 FUNDING OPTIONS FOR UTILITY REDUCTION MEASURES

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 at a low interest rate (typically 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, the School District proceeds to implement funded projects through the traditional bid/specification process. Contact: Eddy Trevino (512/463-1876).

Internal Financing

Improvements can be paid for by direct allocations of revenues from an organization's currently available operating or capital funds (bond programs). 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 budget 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 School District 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 utilities in Texas 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.

Qualified School Construction Bond (QSCB)

The federal government authorizes tax-free bonds (QSCBs) through the American Recovery and Reinvestment Act (ARRA), which help school districts fund new construction and major renovation projects as well as land acquisition. In total, schools will save an estimated $10 billion in taxes using these bonds. They will also help reduce the cost of borrowing for use in construction projects for public schools. For more information, please visit http://www.qscb.us.

Build America Bonds

Under the American Recovery and Reinvestment Act, the Build America Bond program provides funding for local and state governments in order to allow for capital projects on public buildings, including public schools, water and sewer projects, energy projects, and environmental projects. The bonds work by having the Treasury Department issue a state or local government 35 percent of an interest payment on the bonds. This will cause the borrowing costs incurred by the state of local government to be much less, allowing them to reach further sources of borrowing. For further information, please visit http://www.ustreas.gov.

Energy Efficiency and Conservation Block Grant (EECBG)

The Office of Weatherization and Intergovernmental Programs (WIP) has administered the EECBG, which provides funding to state and local governments for the purpose of improving energy usage and efficiency, as well as improving environmental effects. It is being funded under the ARRA, and can include building retrofits and audits, which aim to reduce energy use in buildings and transportation. The State Energy Conservation Office receives a portion of these funds to distribute to cities and counties interested in these projects. Further information can be found by visiting: http://www1.eere.energy.gov/wip/eecbg.html

Qualified Energy Conservation Bonds (QECB)

Energy projects can be eligible for QECBs, which are tax credit bonds that serve to assist with energy efficient capital projects, renewable energy usage, and reductions in energy consumption. The federal government has issued this loan program, which assists with funding of the interest costs for the bonds. These energy conservation bonds are different from tax-exempt bonds

traditionally used because they can be regarded as taxable income. For more information on QECBs, please visit http://www.dsireusa.org.

Qualified Zone Academy Bond (QZAB)

QZABs are available for school districts that can utilize the bonds form the federal government for repair and rehabilitation projects. Tax credits are provided to bondholders nearly equal to the interest that the state or community would normally be expected to pay. It can be utilized for projects that qualify for the program. More information can be found by visiting http://www2.ed.gov/programs/qualifiedzone.

APPENDICES

APPENDIX A

ENERGY LEGISLATION
(SB12, HB3693 AND SB300)

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:

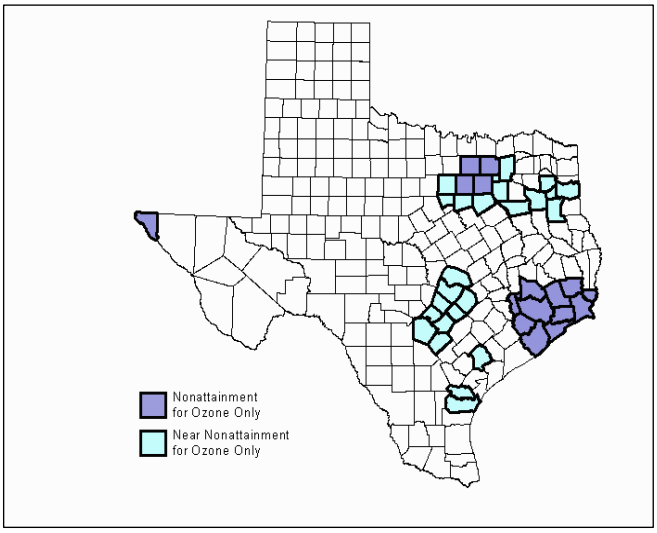
• installation of insulation and high-efficiency windows and doors • modifications or replacement of HVAC systems, lighting fixtures and electrical systems • installation of automatic energy control systems • installation of energy recovery systems or renewable energy generation equipment • building 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.

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BILL ANALYSIS

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Enrolled

AUTHOR'S / SPONSOR'S STATEMENT OF INTENT

Many independent school districts across Texas are reporting severe financial difficulties due to several factors, including the requirement to fulfill unfunded mandates. These mandates are particularly burdensome to fast-growth school districts. In a difficult economic climate and with dwindling resources, districts are forced to fulfill unnecessary mandates rather than focus on their basic mission, which is to educate students.

S.B. 300 amends current law relating to eliminating or modifying certain mandates on school districts.

RULEMAKING AUTHORITY

This bill does not expressly grant any additional rulemaking authority to a state officer, institution, or agency.

SECTION BY SECTION ANALYSIS

SECTION 1. Amends Section 11.1513(d), Education Code, as follows:

(d) Requires that the employment policy provide that not later than the 10th school day before the date on which a district fills a vacant position for which a certificate or license is required as provided by Section 21.003, other than a position that affects the safety and security of students as determined by the board of trustees, the district is required to provide to each current district employee notice of the position by posting the position on a bulletin board at certain locations or, rather than and, the district's Internet website, if the district has a website, and a reasonable opportunity to apply for the position.

SECTION 2. Amends Section 25.112, Education Code, by amending Subsection (d) and adding Subsections (e)-(g), as follows:

(d) Authorizes the commissioner of education (commissioner), on application of a school district (district), to except the district from the limit in Subsection (a) (relating to the prohibition of more than 22 students enrolled in an elementary school class) if the commissioner finds the limit works an undue hardship on the district. Provides that an exception expires at the end of the school year for which it is granted. Deletes existing text providing that an exception expires at the end of the semester for which it is granted, and prohibiting the commissioner from granting an exception for more than one semester at a time.

(e) Requires a district seeking an exception under Subsection (d) to notify the commissioner and apply for the exception not later than the later of October 1 or the 30th day after the first school day the district exceeds the limit in Subsection (a).

(f) Authorizes the commissioner, if a district repeatedly fails to comply with this section, to take any appropriate action authorized to be taken by the commissioner under Section 39.131 (Sanctions for Districts).

(g) Requires the Texas Education Agency, not later than January 1, 2011, to report to the legislature the number of applications for exceptions under Subsection (d) submitted by

each district and for each application indicate whether the application was granted or denied. Provides that this subsection expires February 1, 2011.

SECTION 3. Amends Section 34.0021, Education Code, by amending Subsections (a) and (b) and adding Subsection (c-1), as follows:

(a) Authorizes, rather than requires, each school district, pursuant to the safety standards established by the Department of Public Safety under Section 34.002, to conduct a training session for students and teachers concerning procedures for evacuating a school bus during an emergency.

(b) Provides that a school district that chooses to conduct a training session under Subsection (a) is encouraged to conduct the school bus emergency evacuation training session in the fall of the school year. Provides that the school district is also encouraged to structure the training session so that the session applies to school bus passengers, a portion of the session occurs on a school bus, and the session lasts for at least one hour. Deletes existing text requiring a school district to conduct the school bus emergency evacuation training at least twice each school year, with one training session occurring in the fall and one training session occurring in the spring. Deletes existing text requiring that a portion of the training session occur on a school bus and requiring the training session to last for at least one hour.

(c-1) Provides that a school district, immediately before each field trip involving transportation by school bus, is encouraged to review school bus emergency evacuation procedures with the school bus passengers, including a demonstration of the school bus emergency exits and the safe manner to exit.

SECTION 4. Amends Section 44.902, Education Code, as follows:

Sec. 44.902. New heading: LONG-RANGE ENERGY PLAN TO REDUCE CONSUMPTION OF ELECTRIC ENERGY. (a) Creates this subsection from existing text. Requires the board of trustees of a district to establish a long-range energy plan to reduce the district's annual electric consumption by five percent beginning with the 2008 state fiscal year and consume electricity in subsequent fiscal years in accordance with the district's energy plan. Deletes existing text requiring the board of trustees of a district to establish a goal to reduce the school district's annual electric consumption by five percent each state fiscal year for six years beginning September 1, 2007.

(b) Requires that the plan required under Subsection (a) include strategies for achieving energy efficiency that result in net savings for the district or can be achieved without financial cost to the district and for each strategy identified under Subdivision (1), the initial, short-term capital costs and lifetime costs and savings that may result from implementation of the strategy.

(c) Requires the board of trustees, in determining under Subsection (b) whether a strategy may result in financial cost to the district, to consider the total net costs and savings that may occur over the seven-year period following implementation of the strategy.

(d) Authorizes the board of trustees to submit the plan required under Subsection (a) to the State Energy Conservation Office for the purposes of determining whether funds available through loan programs administered by the office are available to the district.

SECTION 5. Repealer: Section 44.901(b) (regarding the requirement that the board of trustees establish a goal to reduce electric consumption by five percent each year for six years), Education Code.

SECTION 6. Provides that this Act applies beginning with the 2009-2010 school year.

SECTION 7. Effective date: upon passage or September 1, 2009.

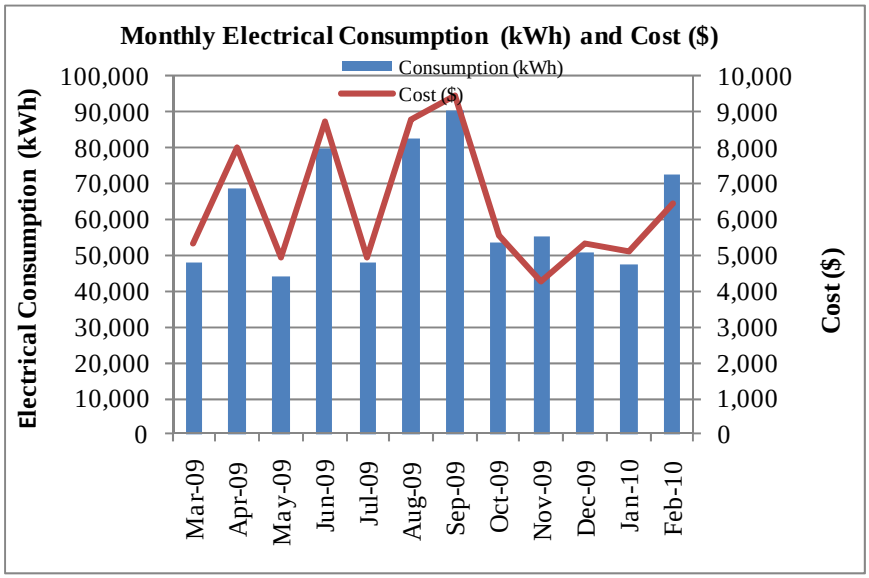
APPENDIX B

SAMPLE UTILITY DATA REPORTING FORM

Waelder ISD - Sample Utility Input Form

MONTH	ELECTRICITY		
	KWH	COST $	Avg. Rate $/KWH
Mar-09	47,695	5,348	$0.1121
Apr-09	68,710	8,009	$0.1166
May-09	43,824	4,955	$0.1131
Jun-09	79,984	8,735	$0.1092
Jul-09	47,912	4,945	$0.1032
Aug-09	82,304	8,780	$0.1067
Sep-09	90,246	9,475	$0.1050
Oct-09	53,363	5,528	$0.1036
Nov-09	55,007	4,283	$0.0779
Dec-09	50,980	5,316	$0.1043
Jan-10	47,372	5,083	$0.1073
Feb-10	72,472	6,436	$0.0888
Total	739,869	$76,892	$0.1039

Gross Building Area:	60,614	SF



APPENDIX C

BASE YEAR CONSUMPTION HISTORY

Energy Cost and Consumption Benchmarks								
		Electric				EUI	ECI	
	Building	kWh/Yr	MMBTU/Yr	kWh/SF	$Cost/Yr	kBTU/SF/Yr	$/SF/Yr	SF
1	Waelder Elementary	67,380	230	6.08	7,236	21	0.65	11,079
2	Waelder Jr. High School	106,448	363	9.48	11,291	32	1.01	11,223
3	Waelder High School	257,526	879	15.54	25,931	53	1.56	16,570
4	Cafeteria	52,035	178	13.89	5,562	47	1.48	3,746
5	Gym/Central Offices	256,480	875	14.25	26,872	49	1.49	17,996
		kWh/Yr	MMBTU/Yr	kWh/SF	$Cost/Yr	kBTU/SF/Yr	$/SF/Yr	SF
		739,869	2,525	12.21	76,892	42	1.27	60,614

District: Waelder ISD

ACCOUNT# 029405 Electric

Gas

BUILDING: Waelder Elementary FLOOR AREA: 11,079 estimated

		ELECTRICAL					PROPANE	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	GALLONS	COSTS ($)
Mar	2010	2,933		0		339	0	0
Apr	2010	4,330		0		515	0	0
May	2010	6,361		0		723	0	0
Jun	2010	7,957		0		876	0	0
Jul	2010	3,294		0		350	0	0
Aug	2010	5,889		0		644	0	0
Sep	2010	8,341		0		890	0	0
Oct	2010	5,118		0		544	0	0
Nov	2010	5,058		0		408	0	0
Dec	2010	4,251		0		458	0	0
Jan	2011	5,353		0		587	0	0
Feb	2011	8,495		0		900	0	0
TOTAL		67,380				7,236	0.0	0

Energy Use Index:

Annual Total Energy Cost = 7,236 $/year

Total site BTU's/Yr ÷ Total Area (SF) = 21 kBTU/SF/year

Total KWH/yr x 0.003413 = 229.97 MMBTU/year

Total Gallons/yr x .0196 0.00 MMBTU/year

Energy Cost Index:

Total Other x_____ = 0.0 MMBTU/year

Total Energy Cost/Yr ÷ Total Area (SF) = 0.65 $/SF/year

Total Site MMBTU's/yr = 230 MMBTU/year

Electric Utility: City of Waelder

Propane Utility:

District: Waelder ISD

ACCOUNT# 029403 029411 Electric

Gas

BUILDING: Waelder Jr. High School FLOOR AREA: 11,223 estimated

		ELECTRICAL					PROPANE	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	GALLONS	COSTS ($)
Mar	2010	4,756		0		548	0	0
Apr	2010	7,274		0		862	0	0
May	2010	9,722		0		1,105	0	0
Jun	2010	13,170		0		1,448	0	0
Jul	2010	7,470		0		782	0	0
Aug	2010	10,204		0		1,100	0	0
Sep	2010	16,066		0		1,694	0	0
Oct	2010	10,470		0		1,091	0	0
Nov	2010	9,594		0		755	0	0
Dec	2010	5,568		0		594	0	0
Jan	2011	5,501		0		603	0	0
Feb	2011	6,653		0		710	0	0
TOTAL		106,448				11,291	0.0	0

* Natural Gas service not included in this summary.

Energy Use Index:

Annual Total Energy Cost = 11,291 $/year

Total site BTU's/Yr ÷ Total Area (SF) = 32 kBTU/SF/year

Total KWH/yr x 0.003413 = 363.31 MMBTU/year

Total Gallons/yr x .0196 0.00 MMBTU/year

Energy Cost Index:

Total Other x_____ = 0.0 MMBTU/year

Total Energy Cost/Yr ÷ Total Area (SF) = 1.01 $/SF/year

Total Site MMBTU's/yr = 363 MMBTU/year

Electric Utility: City of Waelder

Propane Utility:

District: Waelder ISD

ACCOUNT# 029412 029410 Electric

Gas

BUILDING: Waelder High School FLOOR AREA: 16,570 estimated

		ELECTRICAL					PROPANE	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	GALLONS	COSTS ($)
Mar	2010	18,431		0		2,053	0	0
Apr	2010	26,439		0		3,068	0	0
May	2010	11,561		0		1,302	0	0
Jun	2010	26,757		0		2,912	0	0
Jul	2010	16,991		0		1,743	0	0
Aug	2010	31,236		0		3,316	0	0
Sep	2010	30,253		0		3,164	0	0
Oct	2010	16,650		0		1,715	0	0
Nov	2010	17,600		0		1,359	0	0
Dec	2010	18,638		0		1,929	0	0
Jan	2011	16,442		0		1,751	0	0
Feb	2011	26,528		0		1,619	0	0
TOTAL		257,526				25,931	0.0	0

Energy Use Index:

Annual Total Energy Cost = 25,931 $/year

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

Total KWH/yr x 0.003413 = 878.94 MMBTU/year

Total Gallons/yr x .0196 0.00 MMBTU/year

Energy Cost Index:

Total Other x_____ = 0.0 MMBTU/year

Total Energy Cost/Yr ÷ Total Area (SF) = 1.56 $/SF/year

Total Site MMBTU's/yr = 879 MMBTU/year

Electric Utility: City of Waelder

Propane Utility:

District: Waelder ISD

ACCOUNT# 029404 Electric

Gas

BUILDING: Cafeteria FLOOR AREA: 3,746 estimated

		ELECTRICAL					PROPANE	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	GALLONS	COSTS ($)
Mar	2010	3,175		0		366	0	0
Apr	2010	4,267		0		507	0	0
May	2010	4,660		0		534	0	0
Jun	2010	5,380		0		597	0	0
Jul	2010	3,197		0		340	0	0
Aug	2010	3,775		0		414	0	0
Sep	2010	5,346		0		571	0	0
Oct	2010	4,485		0		472	0	0
Nov	2010	5,155		0		408	0	0
Dec	2010	3,963		0		422	0	0
Jan	2011	3,916		0		428	0	0
Feb	2011	4,716		0		503	0	0
TOTAL		52,035				5,562	0.0	0

Energy Use Index:

Annual Total Energy Cost = 5,562 $/year

Total site BTU's/Yr ÷ Total Area (SF) = 47 kBTU/SF/year

Total KWH/yr x 0.003413 = 177.60 MMBTU/year

Total Gallons/yr x .0196 0.00 MMBTU/year

Energy Cost Index:

Total Other x_____ = 0.0 MMBTU/year

Total Energy Cost/Yr ÷ Total Area (SF) = 1.48 $/SF/year

Total Site MMBTU's/yr = 178 MMBTU/year

Electric Utility: City of Waelder

Propane Utility:

District: Waelder ISD

ACCOUNT# 029403 Electric

Gas

BUILDING: Gym/Central Offices FLOOR AREA: 17,996 estimated

		ELECTRICAL					PROPANE	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	GALLONS	COSTS ($)
Mar	2010	18,400		0		2,042	0	0
Apr	2010	26,400		0		3,056	0	0
May	2010	11,520		0		1,291	0	0
Jun	2010	26,720		0		2,901	0	0
Jul	2010	16,960		0		1,732	0	0
Aug	2010	31,200		0		3,305	0	0
Sep	2010	30,240		0		3,155	0	0
Oct	2010	16,640		0		1,706	0	0
Nov	2010	17,600		0		1,352	0	0
Dec	2010	18,560		0		1,913	0	0
Jan	2011	16,160		0		1,714	0	0
Feb	2011	26,080		0		2,704	0	0
TOTAL		256,480		0		26,872	0.0	0

Energy Use Index:

Annual Total Energy Cost = 26,872 $/year

Total site BTU's/Yr ÷ Total Area (SF) = 49 kBTU/SF/year

Total KWH/yr x 0.003413 = 875.37 MMBTU/year

Total Gallons/yr x .0196 0.00 MMBTU/year

Energy Cost Index:

Total Other x_____ = 0.0 MMBTU/year

Total Energy Cost/Yr ÷ Total Area (SF) = 1.49 $/SF/year

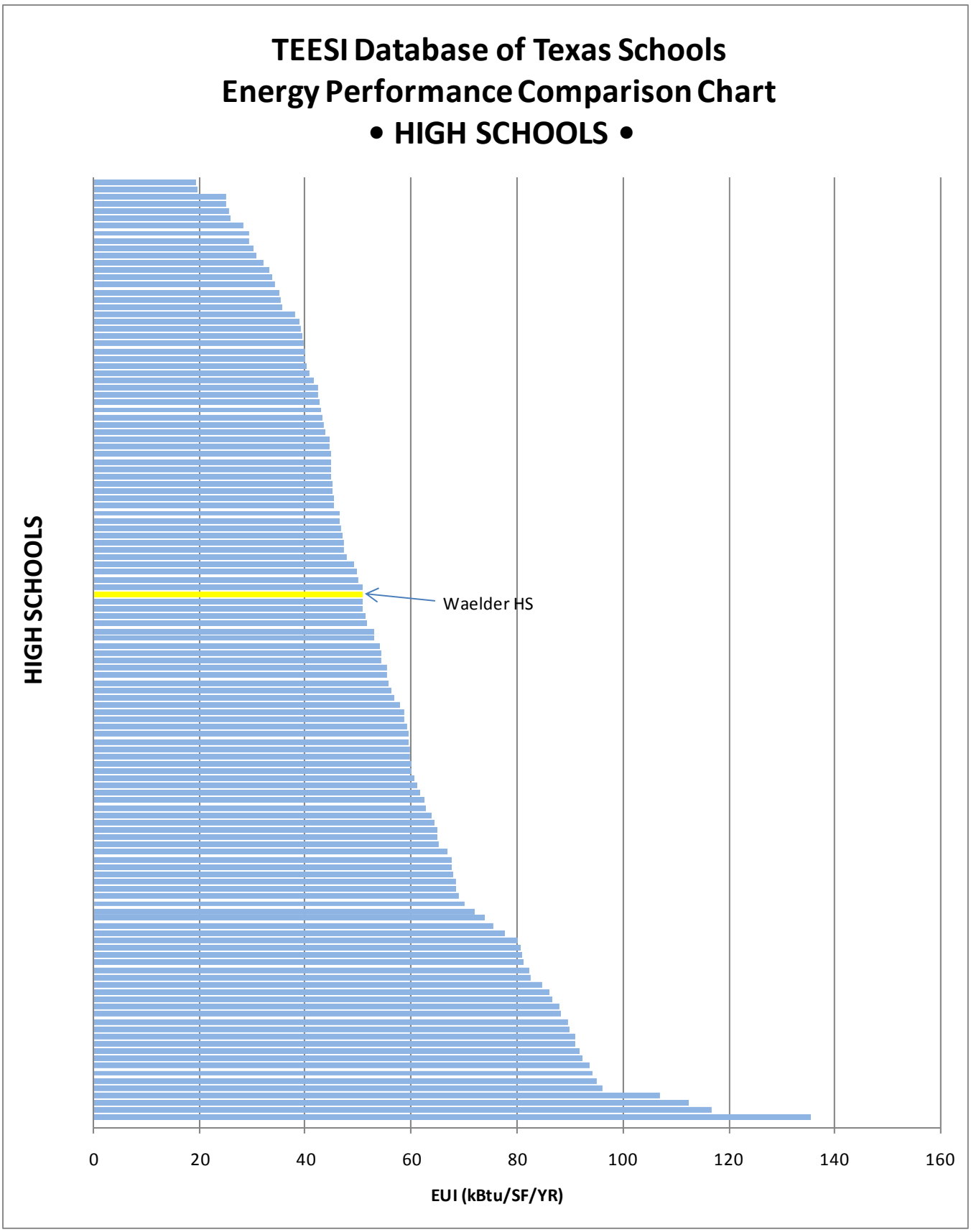
Total Site MMBTU's/yr = 875 MMBTU/year

Electric Utility: City of Waelder

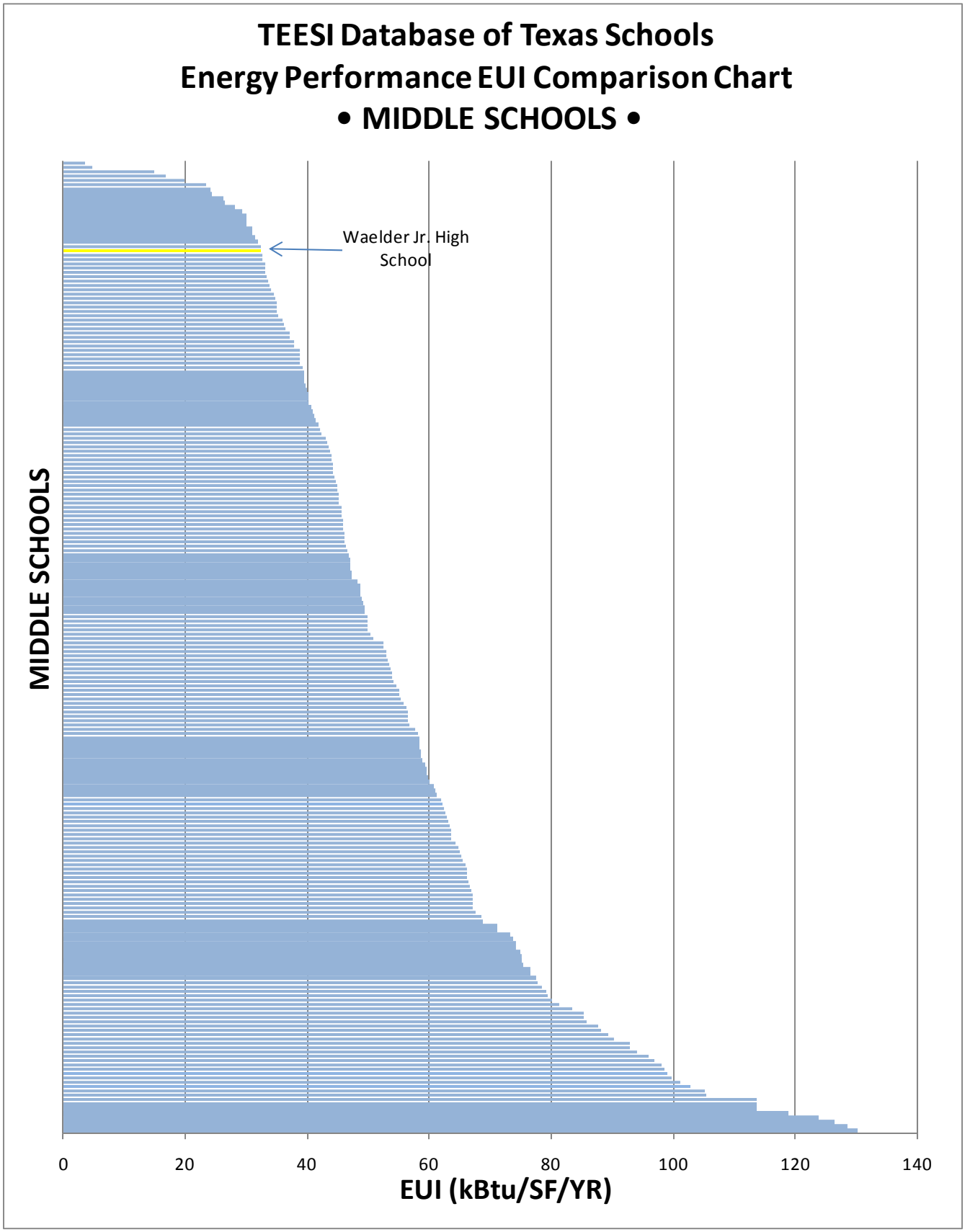
Propane Utility:

APPENDIX D

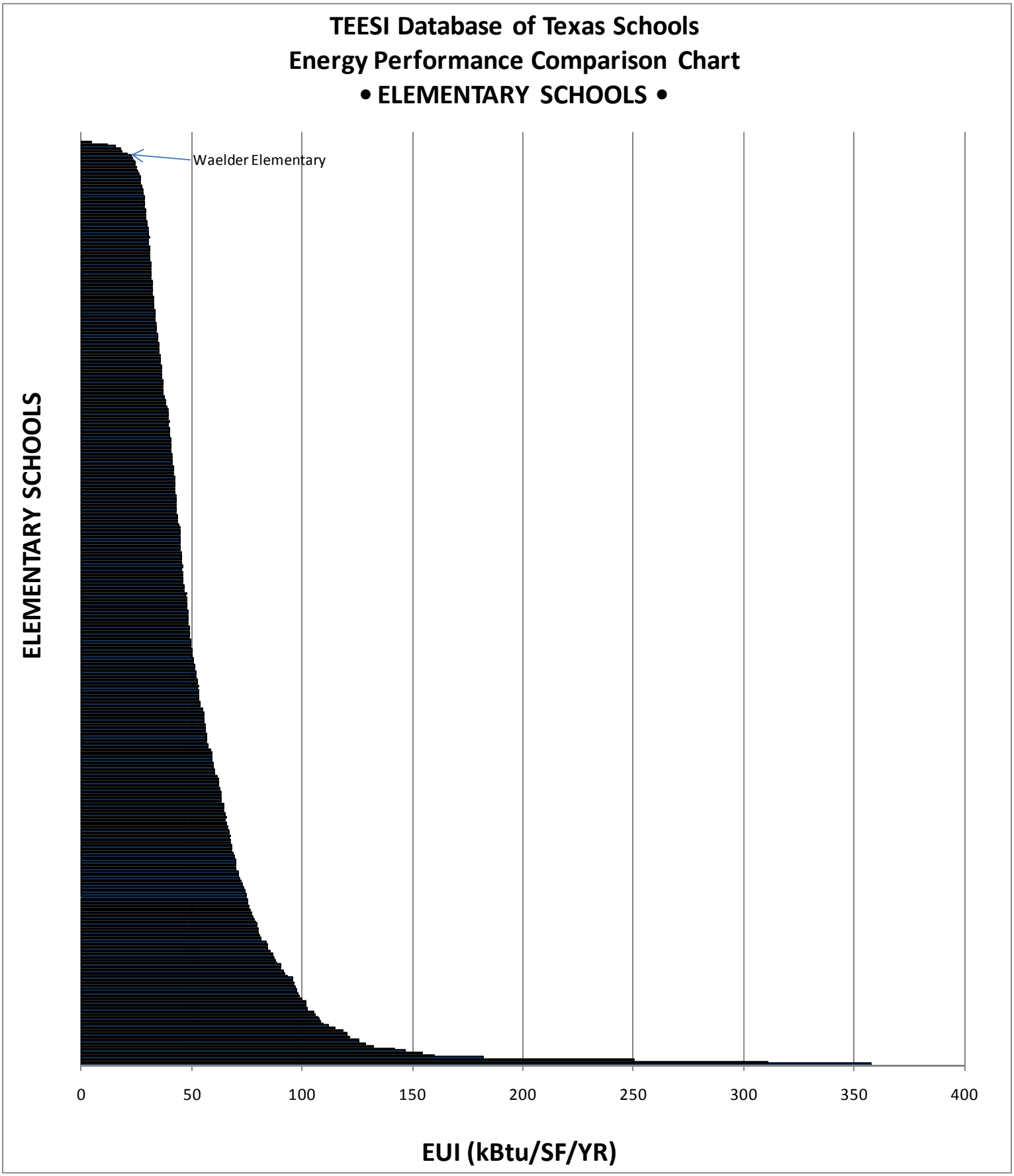
ENERGY PERFORMANCE COMPARISON CHARTS



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Schools)



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Schools)



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Schools)

APPENDIX E

TYPICAL EQUIPMENT MAINTENANCE CHECKLISTS

Fans Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
System use/sequencing	Turn off/sequence unnecessary equipment	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Observe belts	Verify proper belt tension and alignment			X	
Inspect pulley wheels	Clean and lubricate where required			X	
Inspect dampers	Confirm proper and complete closure control; outside air dampers should be airtight when closed			X	
Observe actuator/linkage control	Verify operation, clean, lubricate, adjust as needed			X	
Check fan blades	Validate proper rotation and clean when necessary			X	
Filters	Check for gaps, replace when dirty - monthly			X	
Check for air quality anomalies	Inspect for moisture/growth on walls, ceilings, carpets, and in/outside of duct-work. Check for musty smells and listen to complaints.			X	
Check wiring	Verify all electrical connections are tight				X
Inspect ductwork	Check and refasten loose connections, repair all leaks				X
Coils	Confirm that filters have kept clean, clean as necessary				X
Insulation	Inspect, repair, replace all compromised duct insulation				X

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:

Eddy Trevino
SECO, LoanSTAR Program Manager
(512) 463-1876

APPENDIX G

REQUEST FOR ENERGY ASSISTANCE

SECO
State Energy Conservation Office

Public Schools, Colleges and Non-Profit Hospitals

Preliminary Energy Assessment
Service Agreement

Investing in our public schools, colleges and non-profit hospitals 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) will analyze electric, gas and other utility data and work with Waelder ISD, 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 that the Partner is ready and willing to consider implementing the energy savings recommendations.

Principles 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 designated 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 identifies no cost/low cost recommendations, Capital Retrofit Projects, and potential sources of funding. Portions of this report may be posted on the SECO website.
- ✓ Partner will schedule a time for SECO's contractor to make a presentation of the assessment findings 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: 3/2/11

Name (Mr./Ms./Dr.): Mark Weisner Title: Supt.

Organization: Waelder ISD Phone: 830-788-7161

Street Address: 201 US Hwy 90 West Fax: 830-788-7094

Mailing Address: PO Box 247 E-Mail: MarkWeisner@waelderisd.org

Waelder, TX 78959 County: Gonzales

Contact Information:

Name (Mr./Ms./Dr.): Mark Weisner Title: Same as above

Phone: 830-788-7161 Fax: _____

E-Mail: markweisner@waelderisd.org County: _____

Please sign and mail or fax to: Stephen Ross, Schools and Education Program Administrator, State Energy Conservation Office, 111 E. 17th Street, Austin, Texas 78774. Phone: 512-463-1770. Fax 512-475-2569.